

# The role of Kuwait University libraries in supporting graduate students' research

By

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## ABSTRACT

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The purpose of this study is to investigate the role of Kuwait University (KU) libraries in supporting graduate students' research. The focus is on the information use and behaviour of graduate students and the research process. The study is a mixed methods case study carried out in two phases. The first phase (quantitative) is based on responses to a questionnaire distributed to 587 graduate students from four colleges (engineering, arts, science and law) at KU. The second phase (qualitative) is based on in-depth semi-structured interviews conducted with 48 students from the same sample. The results of the first phase highlighted disciplinary differences in using the library. Whitley's theory (2000) was used as a framework to help understand disciplinary differences that shaped the information use and behaviour of the graduate students in the studied cases. However, no research has been conducted using Whitley's theory to understand the role of the library in supporting graduate students' research, particularly in developing countries. Therefore, this research aims to fill that gap. In addition, the findings of this study may assist Kuwait University Libraries Administration (KULA) in designing an intervention to support different disciplinary needs.

The four specialised fields (electrical engineering, microbiology, Islamic history and public law) are compared as nested cases. Each discipline has its own culture and needs, which in turn shape the students' information needs. An analysis of these needs revealed similarities in the use of the library across the disciplines, as well as significant differences. The findings indicate that cultural elements—such as the nature of the discipline; the study mode; information needs; students' personal experiences; library services; external sources and financial adequacy—all had a great influence on graduate students' use of KU libraries during the research stages.

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# CHAPTER 1 – INTRODUCTION

---

## 1.1 Introduction

The focus of this study is on the role of the academic library in supporting graduate students' research. Research has become an increasingly important priority in universities and colleges around the world, as they are ranked based on their research output. This has led to a remarkable demand for access to information and a greater emphasis on the quality of information provided (Singh, 2007). Academic libraries play a fundamental role in supporting research in higher education, and library collections and services must reflect changing curricula, information technology (IT) resources and research (Association of College and Research Libraries, 2006). Students and faculty members expect academic libraries to support and promote their research. In order to investigate the library's research support role for graduate students in Kuwait, it is important to understand these students' information needs, information use and information behaviour within the academic library environment to assess their library support needs, and to examine whether the staff proficiencies and the services currently provided are capable of meeting these needs. To maintain efficient and effective library services for graduate students, it is essential to provide library services according to the changing needs of researchers in the digital age.

Graduate students at Kuwait University (KU) come to the library to do research and hope to efficiently find the materials they need (Maughan, 1999; Hogland and Clougherty, 2002a; Kuruppu and Gruber, 2006). However, many of the graduate students are unaware of the range of services available at the library (Hogland and Clougherty, 2002b; Togia and Tsigilis, 2009). This study contributes to our understanding of the graduate students' information needs for research purposes.

An analysis of the relevant literature reveals that only a small number of studies have examined the academic role libraries play in supporting graduate students' research. These have focused on the United States (e.g. Chrzastowski and Joseph, 2006; Jankowska *et al*, 2006; ARL, 2012), the United Kingdom (e.g. RIN, 2008, 2010; Beard and Bawden 2012), Australia (e.g. Henty, 2008; Du and Evans 2011; Richardson *et al*, 2012; Parker, 2012), Cape Town in Africa (e.g. Hart and Kleinveldt, 2011), Nigeria (e.g. Nwagwu, 2012), Egypt in the Middle East (e.g. Abdullah, 1999; Abdul-Aziz, 2005), Pakistan (e.g. Arif and Mahmood, 2008), Malaysia (e.g. Rasul and Singh, 2010) and Finland (e.g. Forsman *et al*, 2012). However, it would not be useful

to generalise their results to other countries with different social environments and cultures, such as Kuwait. Due to specific cultural characteristics (personal, political, economic and legal), Kuwait is a unique developing country. It is characterized by a petroleum-based economy, and the Kuwaiti dinar is the highest-valued currency unit in the world. Thus, it is considered to be the fourth richest country in the world (Nee, 2014). In the context of KU, culture influences the way graduate students use the library. For this reason, this study facilitates the understanding of the specific information needs and behaviour of graduate students in the context of KU and also provides a fuller picture of how library resources and services can be improved to best meet students' needs.

## **1.2 Significance of the study**

The role of academic libraries in supporting research at KU has not been previously researched. As discussed in the literature review, there have only been a few relevant studies. For example, Hamade and Al-Yousef (2010) conducted a study to investigate the use of information resources by library and information science (LIS) graduate students at KU. Al-Muomen *et al* (2012) conducted a study to model the information-seeking behaviour of graduate students at KU. The recommendations of both studies focused on enhancing the role of the library to meet the information needs of graduate students. The main concern of the present study is the supporting role played by KU libraries for research, in relation to the different cultural context of the disciplines, and their influences on the information use and behaviour of the graduate students, along the research process. The hope is that the findings of the present study will play a major role in guiding decision makers in forming an intervention plan to improve the university libraries' resources and services to better support research in response to changing needs.

## **1.3 The context of Kuwait**

It is important for the reader to have a basic understanding of the characteristics of the country in which the study was conducted. Kuwait is located in south-western Asia on the north-western coast of the Arabian Gulf. It is bounded to the northwest by Iraq, to the east by the Arabian Gulf and to the south by Saudi Arabia. Figure 1.1 shows a map of Kuwait.



**Figure 1-1: Map of Kuwait**

(Courtesy of Encyclopaedia Britannica, Inc., copyright 2007; used with permission)

(See Appendix 9 B)

Kuwait ranks as the eleventh richest country by income in the world (Hvidt, 2013). The population of Kuwait was estimated to be approximately 2.65 million in 2014, and 98.3% of the population lives in urbanised areas. Nearly 59.2% are Kuwaiti and other Arabs, and the majority of the population (76.7%) is Muslim. Arabic is the official language of the country, but English is widely spoken as an official second language. The literacy rate in Kuwait was 93.9% in 2008; men are slightly more literate than women (95% vs. 91.8%), despite the fact that they spend less time in school than women (The World Fact Book, 2014). Table 1.1 summarises the socio-cultural facts about Kuwait.

**Table 1-1: Information on Kuwait's population and society**

Indicator	
<b>Total population</b>	2,742,711 (July 2014 est.)
<b>GDP</b>	\$ 153 billion (2013 est.)
<b>Education expenditures</b>	3.8% GDP (2006)
<b>Ethnic groups</b>	Kuwaiti, 31.3%; other Arabs, 27.9%; other nationalities, 40.3% (2013 est.)
<b>Religion</b>	Muslim, 76.7%; Christian, 17.3%; unspecified, 5.9 % (2013 est.)
<b>Sex ratio</b>	1.43 Male: female (2014 est.)
<b>Median age</b>	28.9 years old (2014 est.)
<b>Language</b>	Arabic (official); English widely spoken
<b>Literacy</b>	Total population: 93.9% (est. 2008) Male: 95%, Female 91.8%

Source: (The World Fact Book, 2014)

Education is a fundamental right of every citizen in Kuwait. Schools in Kuwait consist of four levels: kindergarten (two years), primary (five years), intermediate (four years) and secondary (three years). The Kuwaiti government provides free state-run education for all children. This free education includes meals at school, clothing, transportation and books. Schools below the university level are typically segregated on the basis of gender, but the students receive the same education programmes. The government encourages students to continue their education after the secondary level, and they have the option of going to a vocational school or a university (The World Fact Book, 2014).

## **1.4 Background about Kuwait University**

KU is the only public research university in the state of Kuwait, although there are private universities. Established in 1966, its academic programme launched with the College of Science, the College of Arts, the College of Education and a Women's College, with only 418 students and approximately 31 faculty members. One year after its establishment, three additional colleges were founded—the College of Law; the College of Sharia'h and Islamic Studies, and the College of Commerce, Economics and Political Science. Later, the College of Business Administration was inaugurated. Today, KU offers 85 undergraduate and 48 graduate

programmes through 16 colleges with approximately 1,400 academic staff, 35,000 undergraduate students and 2,500 graduate students (Kuwait University, 2014). The university's vision is to provide 'world-class education through its commitment to advancing, preserving and disseminating knowledge and preparing educated qualified human resources to realise the society's developmental needs' (Kuwait University, 2014). The following section provides a detailed account of the KU College of Graduate Studies (CGS), which is the main focus of this research.

## **1.5 Kuwait University higher education context**

The history of post-baccalaureate education (college level in the UK) at KU can be traced back to 1966 when the by-laws setting the university's rules and regulations were established, allowing for the teaching of graduate studies at both the Master's and Doctoral levels (CGS, 2013a). During the 1968/69 academic year, graduate work started in the College of Science, the College of Arts and Education and the College of Commerce, Economics and Political Science. Between 1968 and 1976, graduate studies were offered under the direct supervision of individual academic departments and colleges. The CGS was officially established in 1977; since then, it has been assigned the task of supervising the implementation of KU policies concerning graduate studies. Between 1996 and 2006, the by-laws governing the Master's degree programmes were expanded to include PhD degree programmes and joint degrees, in addition to special graduate diploma programmes (CGS, 2013a).

During the 2005/2006 academic year, several proposals aimed at establishing new graduate programmes were prepared, evaluated and/or approved. All approved programmes are evaluated every five years by internal and external experts. KU is continuously striving to develop its academic programmes; therefore, the CGS expanded its programmes in 2000/2010 to include a number of doctoral degree programmes to help meet the needs of society (Kuwait University, 2014).

## **1.6 Kuwait University Libraries Administration**

Kuwait University Libraries Administration (KULA) is at the centre of the academic and research activities at KU (Al-Ansari and Al-Kulib, 2011). The university libraries are organised under the supervision of KULA, whose mission is to provide quality access to information in all formats to support and enhance teaching, learning, scholarship and research within the university and the local community. Eight university libraries are linked through a high-speed university intranet managed by KULA and headed by a director, and each library serves as a

unit managed by a senior librarian (Al-Ansari and Al-Kulib, 2011). These libraries are spread over different campuses in various locations and include the Jaber Al-Ahmed Central Library (Social Science, Administrative Science and Arts); the Engineering and Petroleum Library; the Science Library; the Education Library; the Sharia'h and Islamic Studies Library; the Law Library; the Arts Library/Women and the Women's College Library (Kuwait University Libraries' Guide, 2006). KULA deals with technical processing and manages all materials and specialised collections of 11 faculty libraries. The only library not under KULA supervision is the Health Science Library, which is supervised by the Health Science Centre Library Administration (HSCLA). Throughout the academic year, KULA-supervised university libraries, usually the libraries open from 8:00 am to 9:00 pm Sunday–Thursday and from 8:00 am to 2:00 pm on Saturdays. The libraries are closed on Fridays. During the holy month of Ramadan, the libraries are open from 9:00 am to 1:30 pm, and during the summer vacation, they are open from 8:00 am to 2:00 pm (Kuwait University Libraries' Guide, 2006). KULA controls expenditures, procurement, technical services and distribution of library materials for all faculty and special collection libraries (Al-Ansari, 1999).

### 1.6.1 The libraries' collections

KULA maintains 651,042 volumes of Arabic and non-Arabic monographs, reference materials, dissertations and reports in different domains of knowledge. KULA subscribes to 76 databases, such as bibliographic and full-text databases, and electronic books (e-books) on various topics. It also maintains 1,645 Arabic and non-Arabic periodicals (print) and 783 Arabic and non-Arabic online scientific journals. Audio-visual materials include approximately 20,000 items: 9808 scientific films, approximately 1254 original manuscripts and 21,496 copies. The special collections include 15,554 volumes, including United Nations (UN) publications (KULA, 2014).

### 1.6.2 The libraries' services

The various library information services include:

- **Circulation:** This service covers physical borrowing and online services, including renewing and/or reserving books. Graduate students, lecturers and teaching assistants are allowed 10 books per month.
- **Photocopying:** Photocopying services are available only during the day from 8:00 am to 1:30 pm. In some libraries, tokens or magnetic cards are available to faculty members and



graduate students. Photocopying and circulation services are both provided by clerical staff (Al-Ansari and Al-Kulib, 2011);

- **Reference desk:** Information specialists are available at the reference desk to provide help and answer users' queries.
- **Instruction and orientation:** These services aim to familiarise users with the libraries and how to use the resources, such as the online public access catalogue (OPAC), electronic journals (e-journals), reference materials and online searching.
- **Internet:** This service allows users access to electronic resources (e-resources), such as bibliographic databases, OPACs and e-journals.
- **Interlibrary loan (ILL):** This service is only available during the day from 8:00 am to 1:30 pm for faculty members and graduate students and provides them with materials that are only available at local or regional libraries, including Gulf Cooperation Council (GCC) and international libraries, such as the British Library Document Supply Centre (BLDSC). KU faculty members are entitled to 30 articles free of charge per year.
- **Reserve materials:** These materials include items reserved upon a professor's request and can only be used inside the library.
- **Selective dissemination of information:** This service provides researchers with regular updates on current developments in the literature.
- **Electronic services:** KULA provides a network service for collecting academic information from inside and outside the university via its automated system, through which all resources (OPAC, e-journals, e-books, book renewals, etc.) can be accessed via its website.
- **Online searching:** KULA provides faculty members with online search facilities via a direct link with the DIALOG database in the USA through which users can search 800 electronic files in various disciplines. This service provides bibliographic citations for journal articles, in addition to access to abstracts and full-text articles.
- **Database search:** English and Arabic electronic databases are available at KULA libraries through the KULA website (Kuwait University Libraries Guide, 2006).
- **Workshops:** Workshops to train students and faculty members on how to locate information using the library system's online resources (OPAC, databases, etc.) are available on request and at the beginning of the academic year.

The following sections (1.6.3 to 1.6.6) provide detailed information on each of the four specialised libraries that are the focus of this research. These libraries were selected because they reflect a range of specialist disciplines and diversity within the library services.

### **1.6.3 The Engineering and Petroleum College Library**

The Engineering and Petroleum Library holds a diverse collection, covering specialised books, academic journals and reference materials, such as non-circulating audio visual materials covering different engineering fields. All the engineering databases can be searched from the KU campus or off campus by faculty members and to a lesser extent by graduate students. The library provides online search access to leading databases in the field (e.g. that of the Institute of Electrical and Electronic Engineers or IEEE). Document delivery (DD) and ILL services are also available to faculty members and graduate students (College of Engineering and Petroleum, 2012).

### **1.6.4 The Science College Library**

The Science Library contains a comprehensive collection that includes specialised books and academic journals from all branches of science, as well as reference materials. It also offers non-circulating audio-visual materials covering different scientific fields. The library provides a network service via KULA for collecting academic information on and off campus. Access to the library collection and services is available for faculty members both on and off campus, while graduate students can access them only on campus. The library provides online search access to 16 leading databases in the field, such as Science Direct and Science Finder. DD and ILL services are also available to faculty members and graduate students (KULA, Science College Library, 2012).

### **1.6.5 The Law College Library**

The Law Library has existed since the creation of the Faculty of Law in 1967. It has a wide-ranging collection that includes Arabic and non-Arabic sources, such as books, academic journals and reference materials. It provides information services and a variety of information resources in both print and electronic format. The library provides access to two Arabic databases, Kuwait Lawyers and International Treaties, in addition to three non-Arabic databases, Westlaw International, Legal Collection and LexisNexis Academic. All these databases can be searched both on and off campus by faculty members, but graduate students can search them only on campus. DD and ILL services are also available to faculty members

and graduate students. The library website contains links to official websites, such as those of the Library of Congress, the British Library, the Kuwait National Assembly (parliament) and the Classification Centre for Judicial Decisions at KU (KULA, Law College Library, 2013).

### **1.6.6 KULA provision for arts**

The Arts Library (Women's Library) was established in 1966/1967 on the university campus. It houses approximately 52,250 Arabic and non-Arabic books and reference works. Arabic and non-Arabic print journals and special collections, such as manuscripts, are available in the University Central Library (Jaber Al-Ahmed). The Arabic book collections are classified according to the Dewey Decimal Classification (DDC) system, and the non-Arabic books are classified according to the Library of Congress Classification (LCC) system. The library subscribes to 15 non-Arabic humanity databases, such as full-text and bibliographic databases (e.g. JSTOR, Historical Abstracts). The library also links to several official websites, such as the Library of Congress, the Arabic collection in the British Library, Arabic and local public libraries and other Arabic university libraries, in addition to providing links to Internet resources. The library offers a photocopying service, as well as self-service photocopying (KULA, Arts College Library, 2012).

## **1.7 Aims of the study**

The study investigates how KU libraries support graduate students' research by considering four major topics: library resources, library services, library use throughout the different research stages and factors affecting graduate students' use of the university libraries.

## **1.8 Research question**

The study aims to answer the following research question and sub-questions, which determined the research design detailed in Chapter Three.

The main research question is 'How do KU libraries support graduate students' research?'

In order to answer this question, the following sub-questions must be answered:

1. What types of resources and services do graduate students use to support their research?
2. What potential roles do librarians play in guiding and supporting graduate students in their research?
3. How do disciplinary differences affect the information use and information behaviour of graduate students during the stages of their research?

4. To what extent can the library meet the information needs of graduate students?
5. What factors affect graduate students' use of the library during their research process?

### **1.8.1 Emergence of the research questions**

The main research question arose from the researcher's experience with KU libraries when she was a Master's student there. In the early stages of her Master's degree study, the researcher observed that the library services provided for graduate students were not apparent to her and her classmates. In addition, students lacked knowledge about how to use the library's online resources. In conducting research for a Master's course, the researcher reviewed the literature investigating the role of the library in supporting graduate students' research. The proposal for this project developed from that preliminary work.

The research questions were developed throughout different stages of the research process. In the first phase (quantitative data analysis), the researcher examined the viability of the library resources and services provided to support graduate students' research. The findings revealed a difference between the disciplines with regard to library use. This result widened the scope of the study, and the researcher found it necessary to investigate issues related to the use of the library in more depth, such as information behaviour, information use, information needs and the influence of research stages on library use. In the second phase of the study, Whitley's theory was used to investigate disciplinary differences. Whitley (2000) argues that the major differences between disciplines can be characterised based on two concepts: the degree of interdependence between researchers within and between disciplines in making a valid contribution to existing knowledge (mutual dependence); and the degree of uncertainty in producing and evaluating that knowledge (task uncertainty). Application of this theory inspired the researcher to explore the different factors (e.g. the culture of the disciplines, study mode, etc.) that influence graduate students' library use. The expansion of the study dimensions prompted the sub-questions that guided the researcher in answering the key research question. Figure 1-2 shows the research inquiry process.

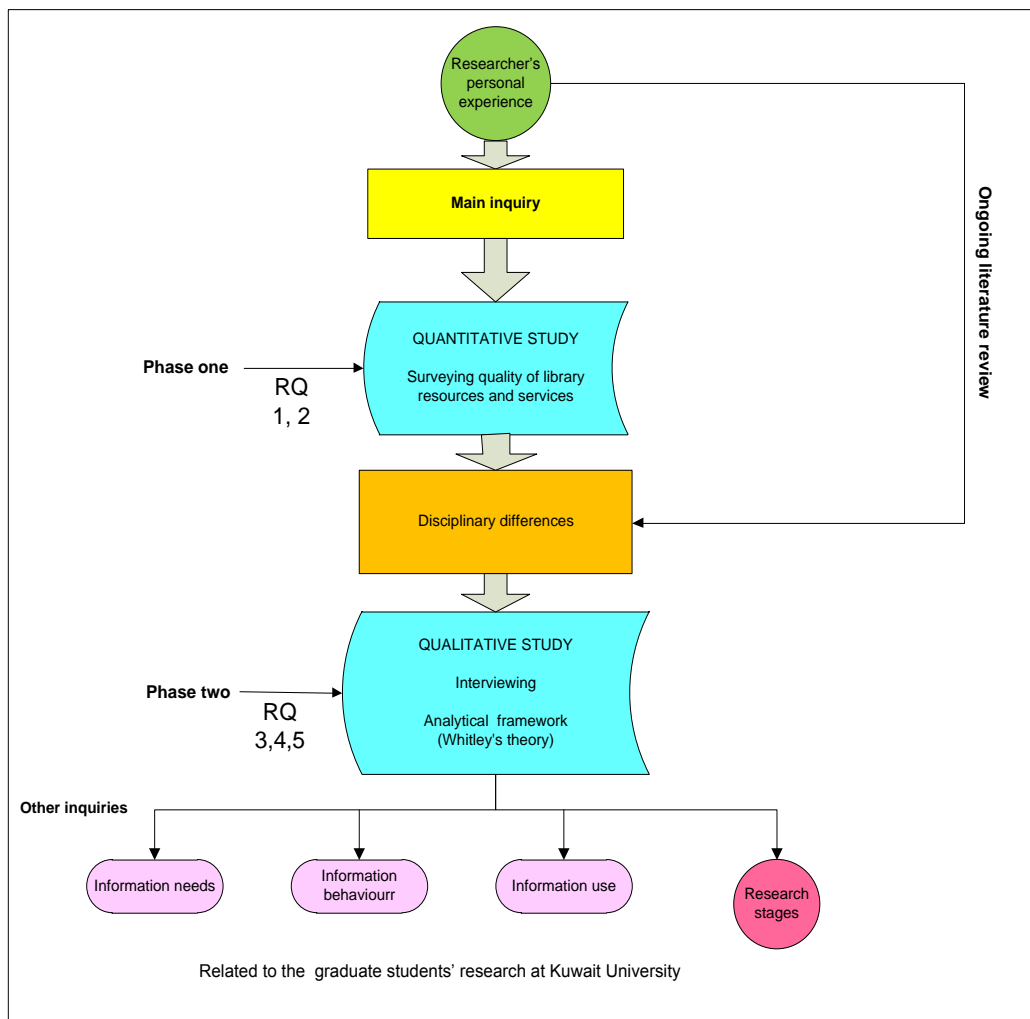


Figure1-2 Emergence of the research inquiry through the research process

## 1.9 Structure of the thesis

This thesis consists of 11 chapters, as follows.

- **Chapter 1 - Introduction:** This chapter consists of the background to the research.
- **Chapter 2 - Literature Review:** This chapter consists of a review of the existing literature related to the role of the academic library in supporting research and the information use and information behaviour of graduate students.
- **Chapter 3 - Research Methodology:** This chapter consists of a detailed description of the research methodology and data analysis techniques, approaches and frameworks used in the study.
- **Chapter 4 - Quantitative Data Analysis:** This chapter consists of the findings of a survey distributed to graduate students studying in four colleges (arts, science,

engineering and law). The aim of the survey was to identify the extent to which the library resources and services are used by the graduate students to support their research.

- **Chapters 5, 6, 7 and 8 (The Electrical Engineering field, the Microbiology field, the Islamic History field and the Public Law field):** These chapters consist of the findings of semi-structured interviews with selected graduate students from the electrical engineering, public law, Islamic history and microbiology departments. The findings were analysed and are reported here. A thematic analysis of the role of the library in supporting graduate students' research is presented. Whitley's theory was used as an analytical approach.
- **Chapter 9- Cross-case analysis:** This chapter consists of a holistic view of the qualitative findings of the study based on a comparison of the similarities and differences in the use of library resources and services by graduate students to support their research throughout the research stages in the disciplinary case studies.
- **Chapter 10- Discussion:** This chapter consists of a further analysis of the findings, identifying the key factors that influence the use of the library by graduate students. This includes a comparison of the findings with those of the reviewed studies and a discussion of supplementary studies related to the findings.
- **Chapter 11- Conclusion:** This chapter focuses on how the study has successfully addressed the aims and objectives and answered the research question. The contributions and limitations of the study are also discussed. Finally, recommendations for improving library services to support graduate students' research are made, and suggestions for future research are provided.

## CHAPTER 2 – REVIEW OF EXISTING LITERATURE

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### 2.1 Introduction

This chapter reviews the literature relating to the role of the library in supporting the research needs, the information use and information behaviour of taught graduate students. Gaining a better understanding of the information needs and behaviour of graduate students in terms of their library use is essential to developing better library services to support their research. Although there is a substantial body of literature on the library use, information needs and behaviour of undergraduate students, relatively few studies have examined graduate students as a particular user group, even in developed countries (Beard and Bawden, 2012). Academic research undoubtedly constitutes one of the most significant uses of academic libraries. Academic libraries should be able to effectively meet the information needs of graduate students in terms of both library services and resources. This study aims to fill the gap in the literature regarding the information use and behaviour of graduate students with respect to the library's role in supporting their research.

#### 2.1.1 Significant definitions

Before proceeding, it is necessary to clarify that 'information use' is linked to a group of key concepts, such as information needs, information seeking, information behaviour and information literacy, which are defined as follows:

- Information needs: 'a recognition that your knowledge is inadequate to satisfy a goal that you have' (Case, 2012, p.5)
- Information seeking: 'a conscious effort to acquire information in response to a need or gap in your knowledge' (Case, 2012, p.5)
- Information behaviour: 'the totality of human behaviour in relation to sources and channels of information, including both active and passive information seeking, and information use' (Wilson, 2000, p.49)
- Information literacy (IL): 'the adoption of appropriate information behaviour to identify, through whatever channel or medium, information well fitted to information needs, leading to wise and ethical use of information in society' (Webber, 2010, p.1)

Because of the specific information needs and behaviour of graduate students as a user group in this research, the above definition of IL was adopted.

### 2.1.2 Literature search

To gain a general overview of the topic, an initial literature search was carried out from January to March, 2009. This was used to review previous work on the research topic, to identify the methodological approaches employed and to plan the current research (Hart, 2001). The literature specific to supporting graduate students' research is limited, especially in terms of information-seeking behaviour and information literacy. A survey of the literature showed that some researchers prefer to adopt a quantitative approach when investigating library use and focus on measuring results based on collecting and analysing data using statistical methods. Others prefer a qualitative approach, which is subjective in nature and involves examining and reflecting on perceptions to gain an understanding of social activities. Some of the studies use both quantitative and qualitative approaches. Because the research phenomenon (the role of KU libraries in supporting graduate students) is complex, the researcher decided that using a mixed methods approach would facilitate a more detailed exploration of the situation and provide a richer overall picture. Therefore, this study employed both quantitative and qualitative research methods in a mixed methods approach to obtain the data required. The quantitative research instrument was constructed based on the literature reviewed. The preliminary literature review highlights some areas such as the use of the library and types of materials used that may lack adequate investigation. Based on those areas, a questionnaire was prepared and divided into four sections: library use, types of materials, user satisfaction and the library's role.

A comprehensive literature search of the key topics (library use, information seeking behaviour and information needs) and arguments that enrich the discussion of the subject was carried out (Hart, 2001). A variety of information sources were accessed, and the citation tracking technique was used, in addition to visiting the University of Sheffield libraries in person to access physical copies of books and journals that were unavailable electronically. Online bibliographic databases were accessed freely through the university library website to conduct the literature search. Some of the sources accessed are listed below.

#### Catalogues

- *StarPlus*, Sheffield University library catalogue (via <https://www.sheffield.ac.uk/library> )
- KU Libraries catalogue (via <http://catalog.library.kuniv.edu.kw/>)



## Databases

- Web of Science
- Directory of Open Access Journals (DOAJ)
- Emerald Full-text and Emerald Management Reviews
- Library and Information Sciences Abstracts (LISA)
- Library Literature and Information Science full-text via EBSCO
- Library and Information Science and Technology Abstracts (LISTA)
- ERIC
- PubMed
- HeinOnline, Law Journal Library

## Other sources

- Google Scholar (<http://scholar.google.com>)
- Free online repositories of relevant literature, such as
  - <http://www.iclc.us/cliej/> <http://www.nova.edu/ssss/QR/>,
  - <http://sajlis.journals.ac.za/pub>
  - <http://dialnet.unirioja.es/documentos>
  - <http://www.jurn.org/>

Initially, the key words and search terms used were ‘research’ or ‘researchers’ and ‘librarianship’ or ‘libraries’ or ‘information’, but these general terms were unproductive, even in combination. The most successful search strategy used in LISA was [information needs AND researchers OR scholar\*]. During the period of the study, the research topic developed and new key words were identified; therefore, the search strategies were modified accordingly. The new key words used were ‘information’ and ‘graduate students’ or ‘post-graduate students’ or ‘doctoral students’. Searching the Library Literature and Information Science database (LLIS) or LISA using a combination of the above key words, such as: [post-graduate students AND information], resulted in the retrieval of studies discussing information behaviour, information seeking and information source preferences, which are all relevant to the present study. The search was limited to studies carried out over the last 10 years (from 2005 to 2014) and was not specifically related to any particular geographical area. However, the literature was not restricted to current studies because some older studies that are significant and that are quoted

regularly in the current literature were included. For an example of the results obtained using the search strategy outlined above to search the LLIS database, see Appendix 1.

The literature retrieved using the search strategy was then examined to identify useful references relating to the research topic. During the review, relevant articles were also used to identify additional literature by using the references within articles. The majority of the literature was retrieved from the core journals in the field of librarianship, such as:

- College & Research Libraries
- Portal: Libraries and the Academy
- Journal of Documentation
- Journal of Academic Librarianship
- New Review of Academic Librarianship
- Information Processing & Management
- Issues in Science and Technology Librarianship
- Journal of the American Society for Information Science & Technology

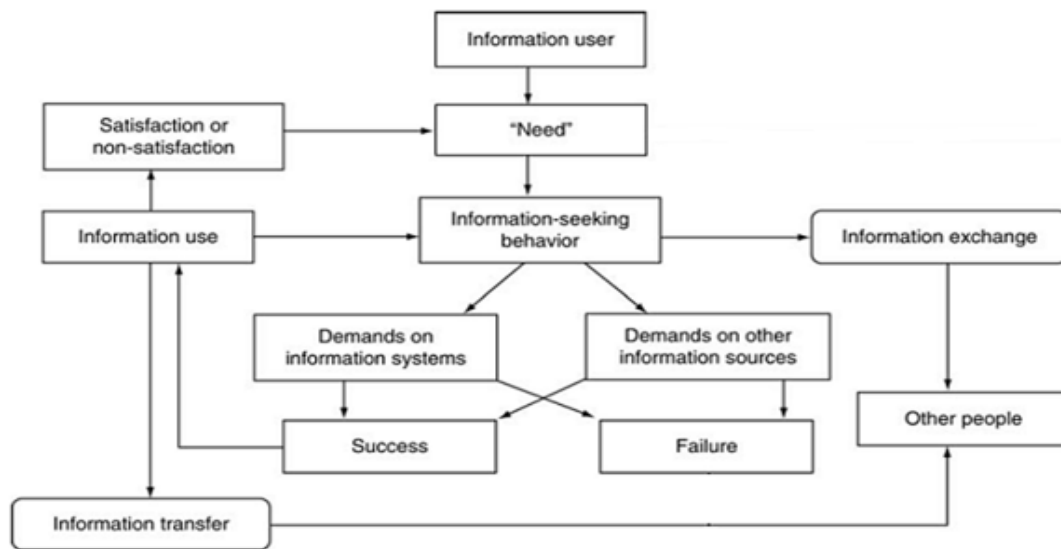
The literature search was not exclusive to journals or books but extended to other online resources, such as conference proceedings, reports and presentations. In addition, dissertations and doctoral theses on similar topics were examined. The collected literature was re-read to reduce the number of articles according to their relevancy, currency and authority. Some literature was discarded, while some remained in the researcher's updated bibliographic database. As the inquiry progressed, existing concepts were revisited, new concepts emerged and related searches of literature databases were conducted to capture as broad a range of reference materials as possible across the disciplines. The process of reviewing the literature was continual throughout the research. Ultimately, the studies and other work selected for the review were those that illuminated the phenomena of information use and offered insight and thus could contribute to the development of the research question and objectives. The relevant literature was also used for comparative purposes to verify the results obtained from the data collected (Hart, 2001).

The following section will focus on related studies concerning the use of the library vis-à-vis the information use and needs of graduate students when conducting research. Seven sections are presented: the first (Section 2.2) explores the concept of information use in the literature dealing with user studies; the second (Section 2.3) outlines the research processes in relation to information use; the third (Section 2.4) deals with graduate students' information use and

behaviour, particularly as relates to their research; the fourth (section 2.5) deals with information use in the studied disciplines with respect to research stages; the fifth (section 2.6) identifies the differences between the disciplines with regard to library use; the sixth (Section 2.7) presents the factors affecting the information use of students and the final one (section 2.8) deals with the role of the library in supporting graduate students’ research.

## 2.2 The concept of ‘information use’

The term ‘information use’ is frequently used in the LIS literature within the context of information-seeking behaviour but is rarely explained or developed. According to the general model of information behaviour, it is assumed that information use starts after the information is sought and usually refers to the way in which people prefer to access diverse sources of information (Savolainen, 2009a). The choice of information source is defined as the process of a user identifying a possible source of information (Foster and Urquhart, 2012). This process is based on several criteria related to the information source—such as need, quality and accessibility—that shape the information use phenomenon (Hjørland, 2011; Foster and Urquhart, 2012). Wilson’s model (1981) in Figure 2.1 shows the place of the information use concept in the context of information-seeking behaviour.



**Figure 2-1: Wilson’s (1981) information behaviour model (adopted from Wilson, 1999, p.251)**

(Reproduced with the permission of the key author T.D Wilson)

(See Appendix 9 C)

Through the model, Wilson suggests that information use arises as a consequence of information-seeking processes. In order to satisfy their information needs, information users

make demands upon formal or informal information sources or services, which results in success or failure in finding relevant information. If successful, the individual makes use of the information found, thereby either fully or partially satisfying the perceived need. The model also shows that information use may involve human sources through which information is exchanged. When perceived as useful, the information may then be passed to other people and may be used by the researcher (Wilson, 1999). The overall behaviour, including both information seeking and information use in relation to the information sources and channels, shapes the individual's information behaviour (Wilson, 2000).

Information use can be considered the main research area in studying information seeking (Tuominen, 1996) and the least studied and least understood information behaviour dimension (Vakkari, 1997). Wilson (2000) has criticised user studies dating back to the 1910s and 1920s, as they focus mostly on library use rather than on information use. According to Bouazza (1989), many years ago there was confusion over the definition of information use. He defined information use as seeking behaviour employed to fulfil individual needs that leads to the use of information. It can be understood from the above definition that information use not only comprises two separate stages of the same process but also that the latter has not yet been defined. Despite Bouazza's (1989) attempt to define information use, there is ambiguity that might cause confusion in understanding the phenomenon.

The problem of defining 'information use' was also highlighted by Menou (1995) in his study of the benefit of information activities for developing countries. He found that most users struggle to respond when asked open questions about the usefulness of information. In the 1960s, user studies started to mainly assess how people choose and approach information sources and channels rather than focusing on the process itself (Dervin and Nilan, 1986; Pettigrew *et al*, 2001). Earlier studies conducted by Allen (1969) and Martyn (1974) focused on the user's purpose in selecting the information sources and the degree to which they were satisfied with the source rather than focusing on the process. Attention was largely focused on the early phase of the information use process, particularly the selection of and access to information sources and channels. Despite the ambiguity of 'information use', information-seeking behaviour and use studies provide a general description of the information use phenomenon. Case (2006) found more than 2000 potentially relevant documents published from 2001 to 2004 that coupled the term 'information' with 'behaviour', 'seeking', 'needs' and 'use'. Although there were no empirical studies that focused solely on information use, different

notions about conceptualising information use have been identified in the literature. Scholars in the LIS field provide a different understanding of information use phenomenon, which, according to Kari (2010), are as follows:

- Information practice: human interaction with information resulting in evaluating, adopting and applying new information (Choo, 2006);
- Information search: the processes of information seeking and information retrieval;
- Information processing: analysis, interpretation and modification of information (Limberg, 1998);
- Knowledge construction: mental constructs or design produced on the basis of thinking (Savolainen, 2009b);
- Information production: creating an expression of knowledge that others can observe (Kirk, 2002);
- Applying information: in some process the role of information is to function as a source (Kari, 2009);
- Effect of information: the change brought about by the information (Kari, 2007).

Based on the literature, it can be seen that different phenomena are related to the same term. Overall, the term ‘information use’ can be applied to any kind of human interaction with information sources. However, it can differ in meaning, depending on the context (Taylor, 1986). For example, when Cook and Brown (1999) and Orlikowski (2002) studied information use in the practice context, the phenomenon could be understood as a set of situational actions. In this case, the application of information is expected to be the interpretation of information use term (Savolainen, 2009 b). It seems that information use acts as a multi-faceted phenomenon (Kari, 2010).

According to Savolainen (2009b), the way people approach information sources and use the information available to them is one form of information practice. Approaching information sources is accomplished by using technological tools to find information and practise information use (Maybee, 2007). The comprehensive term ‘information use’ is the most commonly used term in the literature to refer to how people select and approach information sources (Savolainen, 2009a). According to Spink and Cole (2006), understanding information use as searching for information involves the same processes of information seeking and retrieval. For instance, in some models, information use is regarded as an aspect of information search. In the studies by Maybee (2006; 2007), the concept of information use was perceived

by the participants as involving assessing the credibility of the sources and understanding their features, which affects the process of selecting the sources (Choo, 2006). Concentrating on the source in this conception reflects the secondary nature of information use, which follows the location of the information; finding the source is not enough to conceptualise the phenomenon (Maybee, 2006; 2007).

Information processing usually follows searching for and finding information. It belongs to the use of information through the way in which information is understood, analysed and modified (Limberg, 1998). Referring to the literature, the most fundamental aspect of information processing is approving the source (Spink and Cole, 2006). For example, information use takes place when the sources of information are adopted by retrieving an article after searching for it and reading it. In this case, information use is typically perceived as the last stage of the process being informed (Savolainen, 2000).

Certainly, understanding information through processing it leads to knowledge construction. The use of information in this sense is conceptualised as a process in which ideas are shaped to function as a foundation for thinking (Savolainen, 2009b), for example, the constant drawing and editing of mental maps (Dunn, 1986). Various researchers have studied this concept, such as Savolainen (2006), who defined information use as all types of intellectual and emotional components that can help in the construction of a new understanding, for example, readers using text to make sense of their lives by creating new meaning from the knowledge they have acquired (Ross, 2000).

It is logical to express the constructed knowledge by producing information. In the study by Kirk (2002), information use was understood as making it possible for information to flow based on the sharing of information. This concept of information use is associated with the last stage of information packaging, including publishing (Kirk, 2002). However, it is possible to produce information by combining information (Kari, 2010). For example, this chapter (the literature review) is a result of information/knowledge use because the researcher combined her own knowledge and information received from others in the LIS field to produce it.

When information use is understood as the application of information, the phenomenon is not essentially valuable as a tool (Kari, 2009). The use of information in this case is defined by Kirk (2002) as evaluating information and making decisions, while Savolainen (2009b)

conceptualised the phenomenon as the way in which knowledge is used to solve problems. Al-Fedaghi (2008) defined the phenomenon as the way in which people improve emotionally or physically. Sometimes, information use can be understood as the effect that information has on people or procedures. In this case, the person is not functioning in respect to the information, but the information has caused him to change (Kari, 2007). This concept was acknowledged by Taylor (1991) when asked what information does to an individual's situation or problem, while Al-Fedaghi (2008) conceptualised the use of information as the changes that occur in a person's non-information spaces.

Several expressions in the field of information studies regarding the concept of information use have been identified. Based on the literature reviewed, it is evident that different researchers understand information use differently. It is hard to grasp the concept, as it is often unclearly defined even in user studies or is not defined at all (Larsen, 1980; Savolainen, 2009a). It is difficult to even find two sources that define the information use phenomenon in the same way (Kari, 2010). Few studies explicitly focus on issues relating to information use, apart from the information-seeking behaviour context (Savolainen, 2009a). Information use is a fundamental concept in LIS studies, even though 'there are no definitional or methodological approaches that are broadly accepted or applied' (Choo *et al*, 2008, p.794). The traditional focus in LIS has been on providing access to sources and channels of information (Spink and Cole, 2006).

As the traditional focus in the literature about conceptualising information use has been on how people choose and approach information sources, the researcher adopted the definition of information use provided by Savolainen (2009b), which is 'the way people approach their sources and adopt the information available to them'. The researcher used the term 'information use' for this study based on social perspectives without committing to a particular cognitive standpoint. This definition is the most appropriate in terms of meeting the aims and objectives of the current study. The next section will review the literature with respect to the research process in relation to information use.

## **2.3 The research process and information use**

The research process can be defined as a sequence of stages or tasks that should be carried out to prepare, conduct and report research (Priest *et al*, 2006). According to Case (2012, p.205), there are five typical stages: 1) imagining the research question, 2) determining what data are needed, 3) designing a specific strategy to collect the data, 4) choosing and implementing research methods and 5) considering the overall results. Lönnqvist (2007) has stated that these

stages do not often proceed in a linear way. However, scientific research in the natural sciences follows particular and systematic procedures (Hockey, 2000). The research process and results must meet certain standards (Shugan, 2004). The research process described by March and Storey (2008) for other scientific research, such as design sciences (i.e. engineering), involves the following stages: 1) identifying a new problem; 2) doing background research on the existing knowledge; 3) creating alternative solutions to the problem; 4) developing new models to address the problem; 5) testing and evaluating or redesigning the model and 6) communicating the results.

Uva (1977, p. 268) identified five stages of the research process in the humanities discipline: 1) problem selection; 2) detailed planning of data collection; 3) data collection; 4) analysing and interpretation and 5) writing and re-writing. Stone (1980, p.15) also studied the research process of scholars in the humanities and categorised them into five steps: 1) thinking and talking to people; 2) reading what has been done in the field; 3) studying original sources and making notes; 4) drafting the write-up and 5) revising the final draft. For example, historians employ a wide variety of search tools and services to address their research questions. They use the assistance of archivists in the discovery stage and see them as a fundamental support and as teachers, experts and partners when it comes to working with primary sources. Archives remain central to their research process as sources for original materials. They use secondary sources in the earlier stages of the research process. However, during the writing-up stage, they often use Google books, which they acknowledge as valuable (Rutner and Schonfeld, 2012).

Lacey (2006) described the research process and its stages in a very general way, making them applicable to all kinds of disciplines. These stages are developing the research question; searching and evaluating the literature; choosing the methodology and research design; preparing the research proposal; collecting data; analysing data and disseminating the results. With regard to the research process as a whole, Bukvova (2009) indicated that researchers from different disciplines follow the same procedure. Al-Muomen (2009) found that the research stages could be a significant factor in using information. It was found that students in the final stages are more likely to use e-resources than students in the initial stages. This is an indication that the use of e-resources increases as research progresses.

The above section reviewed the studies covering the research stages in relation to information use. Few studies have explored the significance of the research stages in shaping the



information use of researchers. Some studies have confirmed that each research stage demands particular types of information resources and services. Only one study (Al-Muomen, 2009) confirmed the significance of the research process in using the information. There is a gap in the literature concerning the influence of the research process on the information use phenomenon. The following section will focus on the information use and behaviour of graduate students as a specific user group.

## **2.4 Graduate students' information use and behaviour**

This section focuses on graduate students' information use and behaviour, particularly when conducting research. It is important for librarians to understand the information needs, information use and information behaviour of graduate students because they are the researchers and academics of the future (Rempel and Davidson, 2008). The existing literature investigating various aspects of information-seeking behaviour is extensive, and a growing number of scholars have recently been investigating the information-seeking behaviour of graduate students as a specific user group (e.g. George *et al*, 2006; Sadler and Given, 2007; Dervin and Reinhard, 2007; Chu and Law, 2008; Hoffmann *et al*, 2008; Bruce, 2008; Rempel and Davidson, 2008; Vezzosi, 2009; Wu and Chen, 2010; Beard and Bawden, 2012; Al-Muomen *et al*, 2012; Catalano, 2013), but not many studies over the last decade have focused on information use as a single phenomenon.

Several studies focusing on information-seeking behaviour in developed countries have been conducted. For example, Haglund and Olsson (2008) found that researchers do not search for information in the way preferred by librarians. This is contrary to the finding of Sadler and Given (2007), which is that the library is used by graduate students in exactly the way intended by the library. In the Haglund and Olsson (2008) study, graduate students relied heavily on immediate access to electronic information; they used Google for everything and had little contact with the library.

The Research Information Network (RIN) conducted a number of studies investigating the information behaviour and needs of researchers, including graduate students. In 2007, the study reported that the majority of researchers in all disciplines accessed library resources and other sources of digital content directly from their desktops. Only in the arts and humanities did researchers put a high value on the services offered within the library. However, few researchers, even in the arts and humanities, used print catalogues. The results support the previous findings of Chrzastowski and Joseph (2006), which indicate that the majority of users

are interested in e-resources despite a small constituency calling for a continued focus on print collections. RIN (2007) noted that the library's role may become diluted as young researchers turn to the social network space to share research-based information. In 2008, RIN reported that the training needs of academics 'have tended to be neglected and that in research-active universities, new lecturers are often assumed to have all the skills and knowledge needs' (RIN, 2008).

A recent study by Beard and Bawden (2012) examined library information issues affecting graduate students as a user group and how their needs were being met. They found that graduate students tend to consider print journals an unacceptable alternative if an e-version is unavailable. Regarding books, the situation was more complicated. E-books have not yet gained wide acceptance for a variety of reasons, as their transition to the digital collection is slower. However, Kayongo and Helm (2012) found that most graduate students preferred to access the online library services remotely if the library possessed the items relevant to their research.

Pareek and Rana (2013) found that the central library and the Internet were the most reliable sources of information for graduate students in India, while other libraries were less used. They mostly used reference books, journals and dissertations/theses but made less use of e-resources and ILLs. The majority of researchers complained about the lack of materials in the library to meet their needs. Approximately 30% lacked knowledge about how to access e-resources; approximately 10% found the library hours to be insufficient and others lacked familiarity with the library's OPAC. They expressed a need for advanced training courses by library staff on using the library e-resources and stated that marketing the library services is necessary. The section below will focus on the studies related to the information use and behaviour of graduate students in an Arabic context.

### **2.4.1 Studies at Arabic universities**

University libraries in Arabic countries have struggled with various socio-cultural and technical issues that prevent them from optimising their online services, and universities in the Arab world lack systematic, user-centred research. While many studies have been conducted about the library resources and services used by researchers in developed countries, few have dealt with Arab countries (Al-Aufi and Genoni, 2010). Limited studies have been carried out in the context of Arabic countries in relation to the library resources and services used by academics (e.g. Abdullah, 1999; Boma'rifi, 2001; Bin-Alsabti, 2003; Ibrahim, 2004; Abdul-Aziz, 2005; Al-Aufi and Genoni, 2010; Elzawi *et al*, 2012). Most of the studies conducted in the academic

Arab world have focused on one aspect of information use, such as the use of the Internet. Boma'rifi (2001), Abdul-Aziz (2005) and Elzawi *et al* (2012) found that the unavailability of relevant information in the Arabic language, the lack of English language proficiency and the lack of training are the most commonly reported barriers to academics' effective use of the Internet at universities.

#### **2.4.1.1 Studies at Kuwait University**

A number of studies focusing on non-academic information-seeking behaviour and use within the context of Kuwait have been conducted (e.g. Anwar *et al*, 2004a, 2004b; Anwar and Tuqan, 2006; Al-Daihani and Rehman, 2007). However, few studies have focused on the academic context of Kuwait. Rehman and Ramzy (2004a, 2004b) and Al-Ansari (2006) focused on specific patterns of information seeking, such as the use of the Internet by faculty members or professionals in the context of KU. In similar studies, Al-Najran (1998) and Rehman and Mohamad (2002) focused on undergraduate students as a user group. Al-Khezzi (2002) studied the use of the Internet by graduate students in the education field but limited the scope of his study to the use of the Internet for various purposes (academic, everyday life, leisure or communication purposes).

In the last five years, a few studies have focused on information seeking and use in the academic context as a single phenomenon. Al-Ansari and Al-Kulib (2011) studied the use of the academic library but focused on undergraduate students as a user group. Only two recent studies have been conducted on the information seeking and information use of graduate students. Hamade and Al-Yousef (2010) studied the information use of LIS graduate students at KU, while Al-Muomen *et al* (2012) focused on the information-seeking behaviour and use of graduate students in different disciplines. No study has yet investigated graduate students' information use throughout their research process in different disciplines. The studies related to information use aspects in the KU context that have focused on graduate students as a particular group will be discussed in detail below.

Hamade and Al-Yousef (2010) investigated the use of information by graduate students from the LIS Department using bibliometric methods. The study focused on identifying the preferred resources cited in their research papers, their preferred retrieval methods, the time span of the citations used by students, subject distribution and the most frequently cited journals. The study showed that the majority of the students used journal articles, websites and books as their preferred resources. They mostly used traditional library journals and preferred the print format.

The study revealed that the e-resources and services provided by the library were not fully utilised. Many students still depended on print resources more than electronic ones. This may be due to a lack of awareness and competence in the use of library resources. The study recommended that the university library needs to work closely with faculty members to improve the journal collection to include a combination of print and electronic formats.

The authors of previous studies used only quantitative data collection methods. The adoption of qualitative methods to complement these studies might have shed more light on the factors underlying the lack of awareness about and non-use of library e-resources.

Al-Muomen *et al* (2012) used both quantitative and qualitative data collection methods in a mixed methods approach to investigate the information-seeking behaviour and information use of graduate students at KU. The aim of this wide-ranging study was to model the information-seeking behaviour of the graduate students. The study revealed that significant factors influence these students' information-seeking behaviour and information use. Several factors, both micro and macro in nature, were recognised, with cultural issues ranked as the major factor. The study concluded that a better IT infrastructure was needed to improve the connection speed of the library network; the bureaucracy involved in gaining access to services should be reduced to speed up service; the university library should place fewer restrictions on the availability and types of information resources; both staff and students need in-depth training regarding information literacy and the degree of collaboration between the library staff and academics should be increased.

In summary, a number of studies conducted in developed countries have focused on the information-seeking behaviour of graduate students, but few have focused on information use as an isolated phenomenon. Studies in the Arab world are outdated and focus on one aspect of information use, such as the use of the Internet. This cannot provide the researcher with a clear picture of academics' information use and behaviour. Only two studies (Ibrahim, 2004; Al-Aufi and Genoni, 2010) investigated the use of library e-resources by academics in general, rather than by graduate students in particular. In addition, two recent studies at KU (Hamade and Al-Yousef, 2010; Al-Muomen *et al*, 2012) focused on the information-seeking behaviour and information use of graduate students. These two studies related to graduate students as a user group but are not enough to provide the researcher with a clear understanding of these students' information use and behaviour. There is a gap in the LIS literature regarding the information use and behaviour of graduate students in the academic context. Therefore, there is a pressing need for the current study. The next section will focus on information use in the studied

disciplines in relation to the various research stages.

## **2.5 Information use in the studied disciplines and the research process**

This section focuses on the information use and behaviour of graduate students in different disciplines—engineering, science, humanities (history) and law. These disciplines were chosen because they are the only disciplines at KU that have specialised libraries. Information use that is specific to particular disciplines is treated separately. Studies related to academic disciplines where graduate students undertake writing dissertations, theses or other research projects were reviewed with the aim of identifying the patterns of accessing, selecting and using resources in different disciplines at different stages of research.

### **2.5.1 Engineering graduate students' information use**

This section focuses on the existing literature concerning the information needs and information use of graduate students in engineering. Investigating the information behaviour of scientists and engineers was common from 1940 to 1970. In the mid-1980s, there seems to have been a relative decline. This is not to say that their information behaviour is no longer studied, but investigations into scientists' and engineers' use of sources is less common today. This may be because the phenomenon is now well-documented and so researchers have turned to less studied groups, such as humanities and social science researchers (Case, 2012). The literature review identified a few recent studies investigating the information use of engineers in general and of graduate students in particular. However, not many studies have investigated the information behaviour of electrical engineers as a unique user group. Therefore, to understand the information use and behaviour of electrical engineering graduate students, this section will discuss the literature related to the entire engineering discipline.

According to Du Preez (2008), engineering is concerned with the art and profession of applying technical, mathematical and scientific knowledge to design, structures, machines, devices and systems by processing acquired materials to meet the desired aim or invention. The nature of the tasks (Allard *et al*, 2008) in which they are usually involved exposes them to remarkable information needs and use. Therefore, the information needed by engineering researchers while performing their tasks falls into two types:

- Technical information: including documents about technical solutions and results.

- Contextual information: including undocumented data about the context of the design process. The best source of this information is colleagues (Hertzum and Pejtersen, 2000).

Their information needs change and become more specific as they develop knowledge of their topic of interest during the research process. Electrical engineering students have specific needs (e.g. for software to help with designing), use various web search tools to satisfy their needs and can find most of the information they need using *IEEE Explore* (Chu and Law, 2008). Due to the nature of the discipline and the risky tasks performed, they need to make the right decisions about their designs. Therefore, they tend to acquire accurate and immediate information from colleagues or publications. They are often challenged to get information quickly and regularly rely on colleagues rather than on the library (Hertzum, 2000).

Colleagues are perceived as the most accessible and familiar source of information for engineering researchers (Gerstberger and Allen, 1968; Gralewska-Vickery, 1976; Allen, 1977; Hertzum and Pejtersen, 2000; Hertzum, 2002; Tenopir and King 2004; Du Preez and Fourie, 2009). Typically, engineering students are engaged in highly context-specific information behaviour (Leckie *et al*, 1996) and focus on minimising the effort and time required to acquire information rather than maximising the value of the retrieved information. Therefore, they prefer to obtain information from colleagues and their private collections and rely heavily on Internet search engines (Fosmire and Radcliffe, 2014).

The majority of engineering students confirm that they use the Internet as a starting point to check information for projects and to get ideas about which topic to select for their research (Kerins *et al*, 2004). This supports the findings of Haglund and Olsson (2008, p.55), who concluded that 'For many researchers especially in science, Google is the first choice for information...all kinds of information'. They found that the use of the library's physical finding aids and catalogue has declined as starting points for engineering graduate students' research (Engel *et al*, 2011). Engineering graduate students tend to use e-resources more than other resources (Rowlands, 2007). Because of their increasing use of e-resources, their visits to the physical library have decreased (Engel *et al*, 2011). These findings are closely aligned with those of Hiller (2002), who concluded that engineering graduate students tend to use the library resources remotely and regard desktop delivery as the highest priority in terms of library support. Library study space was not highly valued with regard to conducting their research. They recommended more electronic access to journals and suggested improving DD services

(Engel *et al*, 2011). They might stick to using print text books because of the absence of electronic versions of these sources, in addition to the ease of accessing and reading physical books (Nwagwu, 2012). To make use of information sources, immediate availability is important, even if those sources are not perfect (Du Preez, 2008). Therefore, the most frequently used resources are e-journals, websites and personal communications (Niu *et al*, 2010). This is in line with Leckie *et al* (1996), who found that oral conversations with individuals are the preferred information sources for engineering researchers.

A recent study by Hasoomi and Mehraban (2011) confirmed that the preferred resources of nanotechnology engineering researchers are e-resources and that they use the information centre to meet their information needs. The major problems these students encounter when accessing information are inadequate Internet services and a lack of access to certain databases due to subscription issues.

A later study by Johnson (2013) employed a combination of citation analysis and interviews with faculty members at New Mexico State University (NMSU) to understand engineering graduate students' resource use in conducting research. Others (Kushkowsi *et al*, 2003; Williams and Fletcher, 2006) found that journals are the most heavily used resources by engineering graduate students. However, electrical engineering students use conference proceedings more than their peers in other departments. Standards, patents and websites are less frequently used for dissertation research.

The literature review indicated that the information behaviour of engineering scholars is relatively complex. In *Integrating information into the engineering design process*, Fosmire and Radcliffe (2014) mentioned several factors that can contribute to increasing the information use of engineering researchers.

- **Cost:** This includes the time spent finding, acquiring and processing materials, in addition to the mental and financial costs. The less time and effort the resources cost, the more they will be used by engineering researchers.
- **Accessibility:** Information can be available in the information system but can fall under subscription restrictions. Therefore, engineering graduate students use their supervisors as information sources before the library because they are accessible.
- **Familiarity:** A lack of familiarity with the information system provided by the library leads to its non-use. This is in line with the principle of least cost. When a student is

less familiar with the search system, it will take a lot of time and effort to use it effectively.

- **Quality:** Engineering researchers look for high-quality information resources, but these are not ranked highly in their research process. The difficulty of locating information in less time may lead them to look to the open web and stop them from using many high-quality sources in their research.
- **Relevance/overload:** When conducting their search of the information system, engineering students struggle with the vast quantity of search results and therefore often consult their supervisors to locate information. They also seek assistance with applying the information in the engineering context.

In his recent study about the information needs of engineering researchers and how they obtain information at The College of New Jersey (TCNJ), Tucci (2011) identified eight major information behaviour issues related to library use that need to be addressed, including relying on sources other than those at the library (e.g. the Internet, other online databases or pay-for-view or personal memberships to *IEEE Xplore*). Their use of the library's book collection is declining, and the online catalogue is rarely used because they believe the library's physical collection should be transformed into online resources. The migration to Google Scholar as an alternative source in the absence of a specialised database was identified. According to Baldwin (2009), Google Scholar is working to meet the demand for full-text articles in the engineering discipline (chemical engineering and mechanical engineering). However, the lack of communication between the library and the engineering faculty members at (TCNJ) has resulted in misunderstandings and confusion among the faculty about the difference between searching Google Scholar directly and via the library using journal linking software (Tucci, 2011). Given alternative sources for some information needs, Tucci (2011) stated that due to the availability of a vast amount of information via the Internet, if one article is difficult to access another that is more readily available can be found and used. Therefore, engineering researchers rely heavily on Internet sources that are readily accessible. Furthermore, the inability of ILL to go outside the normal academic process forces engineering researchers to ignore the library as a gateway and use Internet resources, while the development of a bio-engineering programme that involves medicine and biology makes the research culture more collaborative and international. This facilitates the sharing of knowledge through the use of technology, such as the Internet, rather than depending on the library.

Overall, the literature reviewed indicated that:



- Engineering students usually engage in highly context-specific information behaviour.
- Their information needs fall into two categories: technical and contextual information.
- Information needs develop from general to more specific and most current during the research process.
- E-resources are used more than other sources and colleagues are perceived as the most accessible sources.
- Library space is not highly valued with regards to conducting research.
- Accessibility, familiarity, quality, relevance and cost are the main factors that contribute to their use of information.

### 2.5.2 Life sciences graduate students' information use

By definition, science is a study-focused activity that includes gathering information to conduct experiments. Studies of the information-seeking behaviour and information use of scientists have revealed how they access and use professional and research literature (Davis, 2004; Haines *et al*, 2010; Niu *et al*, 2010). However, few scholarly works on information-seeking behaviour in the life sciences have been conducted recently. More specifically, there is a lack of scholarly work on microbiology graduate students as a unique user group. Therefore, to understand the information use and behaviour of microbiology graduate students, this section will discuss the body of work that specifically examines life sciences scholars.

A study conducted by Satish-Kumar *et al* (2011) on the information needs and information-seeking behaviour of life scientists in India found that life scientists make use of a variety of information sources and utilise both print and e-resources for different reasons. They need information for:

- Building background information about their research topics. Usually they use books and monographs for this purpose.
- Keeping up-to-date with current progress in their field. For this, they need to use journal articles to find out what scientists have done recently or are currently doing.
- Obtaining specific information. This need arises during the research process and is directly connected to the research problem. Researchers usually rely on journals, conversations with experts in the field and books. The least-used resources are dissertations and theses (Satish-Kumar *et al*, 2011).

Life sciences graduate students use the library. They frequently use ILL and DD services and often access the scientific digital collections of the library (Vezzosi, 2008). The library catalogue does not appear to be a popular tool for life sciences graduate students; checking for reference works is hardly done, and few of them depend on other libraries. These students use their supervisors as the second source of information after the library (Singh and Satija, 2008). When starting their research, they tend to use a subject-specific database, and this is consistent across the science disciplines (Schonfeld and Housewright, 2010).

Life sciences graduate students confirm that they make use of electronic databases, Google and Google Scholar for their theses (Newton Miller, 2009). This is consistent with the findings of Nicholas *et al* (2010), who found that life sciences researchers count on using general search engines more than browsing the library. Satish-Kumar *et al.* (2011) found that although life sciences researchers express positive attitudes about the library, they suggest that qualified library staff are urgently needed. In addition, they recommend extending the borrowing periods for books and reference materials.

In the study by Vezzosi (2009) on the needs and information-seeking behaviour of life sciences doctoral students at the University of Parma, Italy, nearly all the students confirm that their first point of access for any type of information is the Internet. The majority use the Science Direct database to meet their information needs. The students depend greatly on their respective libraries to check for relevant background information and mostly use the libraries' electronic systems. Almost all the students named Google as a crucial information tool as a starting point for their information searching. This is consistent with the findings of Barrett (2005) and Sadler and Given (2007). Vezzosi's study also revealed that the graduate students' own effort is the most highly ranked way of collecting information, while the librarians and library staff are ranked relatively low.

A large-scale study conducted by RIN (2009) to understand the information use patterns of life sciences researchers in the UK using interviews and focus groups found that life sciences researchers make little use of the university library facilities to access published information. They have replaced the traditional role of the librarian with online direct access, with a heavy reliance on Google, to identify online resources. They do not even use the library catalogue but rely on authoritative websites that contain comprehensive information about their field. Science researchers show a strong preference for using e-resources over print ones. According to Niu and Hemminger (2011), the top e-resources used by science scholars in their research activities are online journals subscribed to by their library and open access journals.

Sethi and Panda (2012) focused on the e-resource use and information needs of life sciences researchers (90.62% graduate students) at Sambalpur University in India using a structured questionnaire. They found that the majority of life sciences scholars (70%) use e-resources, primarily with the aim of updating their information and finding relevant information to complete their research. Their access point tends to be the department laboratory (51.65%), followed by the central library (43.75%). Ease of access is the major factor that influences their use of e-resources. E-journals and e-books are the most popular resources used by life sciences researchers. However, PDF is the preferred format for reading full-text articles. The main factor that prevents them from selectively using e-resources is a lack of training (56.25%), followed by a lack of subscriptions to more foreign journals in their field (40.62%) and a lack of expert help and support. The Google search engine remains the most preferred and extensively used search engine by life scientists.

In a recent study, Aqil and Ahmed (2011) investigated the use of Internet-based resources and services at Aligarh Muslim University (AUM) in India using a survey method. Of the 100 questionnaires distributed to researchers and postgraduate students in the Faculty of Science (including life sciences students), 59 completed questionnaires were returned. The study revealed postgraduate students use the Internet for their research. Their access point is either the department or the library itself. The Internet-based services are the most preferred (52.64%) resources to use for research purposes. The students use online journals (44.96%) through J-gateway and, to a lesser extent, Science Direct (20.15%). They believe that Internet-based services fulfil 26–50% of their information needs compared to print materials. Slow speed is a major barrier to accessing the Internet, and there are insufficient Internet connection terminals in the department or library. In addition, they feel the library staff lack technical knowledge and need further training.

In order to explore the use and preferences regarding article databases in the science discipline, Hightower and Caldwell (2010) surveyed science researchers (life sciences researchers included) at the University of California, Santa Cruz (UCSC). Graduate students constituted 44.5% of the study population. The study showed that science graduate students still rely heavily on article databases.

Atilgan and Bayram (2006) agree that most science researchers are aware of the library's e-resources, and the majority are heavy users of online databases. Because of the increasing focus of interdisciplinary research, as well as the need for readily available resources, the use of multidisciplinary databases has increased. Google Scholar and the Web of Science are preferred

to subject-specific databases across almost all science disciplines. However, this is not the case with life sciences, as researchers in that discipline still prefer to use a subject-specific database (e.g. PubMed) when starting their research. They use Google Scholar regularly along with the database. The quality of the source is more important for life sciences researchers than accessibility, ease of use and speed. These students rank PubMed as the main information source for their research, followed by Google, and they value the ease of access and speed of Google Scholar but perceive its quality as a limitation. This behaviour of life sciences researchers is inconsistent with a science faculty member's assertion in Tucci's (2010) study that 'all researchers' use Google Scholar' and 'soon they will not use licensed databases.' Moreover, e-books have become an important service provided by the library.

In addition to the vast range of print and e-books, journals, bibliographic databases and websites, bioinformatics tools are used by life scientists as relevant information resources. These tools (e.g. GenBank) generally consist of databases of primary biological data and software to help analyse data, such as gene sequences. They are freely and publicly accessible and allow biologists to take full control over the modification and refinement of the analyses they conduct (Bartlett *et al*, 2012). Recently, a small body of literature has examined the use of bioinformatics tools. However, there is a lack of empirical studies about the use of this type of tool (Bartlett and Toms, 2005; Brown, 2005; Haines *et al*, 2010). Quality, accessibility, familiarity and ease of use are the main reasons biologists choose these tools, as well as bibliographic databases.

Past studies on the use and selection of resources by life scientists have indicated that currency and accessibility are important criteria (Grefsheim *et al*, 1991; Curtis *et al*, 1993, 1997; Singh and Satija, 2008), while the preferences for resources vary depending on the specific discipline and research topic (Palmer, 1991a, 1991b; Rolinson *et al*, 1995; Rolinson *et al*, 1996). What is preferred by one group of biologists is often not preferred by another, depending on their research requirements (Bartlett *et al*, 2012). They tend to use the tools that can best help them accomplish what they need to do. Other important criteria include online availability, little or no cost, the ability to handle large data sets and compatibility with other tools (Bartlett *et al*, 2012).

In sum, the studies reviewed above showed that:

- Life scientists use different information sources but show a strong preference for e-resources over print ones.

- They prefer to use a subject-specific database to meet their information needs.
- They need information to build a research background, keep up-to-date and obtain even more specific information.
- Currency and accessibility are important factors when selecting a resource, but quality is the most important.
- They use their supervisor as a second source of information after the library to meet their information needs.

### 2.5.3 Humanities graduate students' information use

Many research studies have examined the information-seeking behaviour of arts and humanities scholars. However, few studies take into account the unique characteristics of each discipline in the humanities, as each group has its own information needs and research culture. To understand the information use and behaviour of specific humanities groups, such as historians, this section will provide a brief overview of the studies on the humanities and then discuss the body of work dealing with historians.

The studies revealed that the nature of humanistic research is non-linear and serendipitous. Because topics in various subject areas are often esoteric, scholars rely heavily on literature searches. Therefore, the use of various information resources in this discipline is necessary (Tahir *et al*, 2010). According to Stone (1982), the following research materials are necessary for the humanities:

- Primary materials: such as artefact, texts, manuscripts, tape-recordings, original literary work, etc.;
- Secondary materials: various editions of texts, drafts, works of criticism and backdated journals.

Secondary sources are often consulted to gain background information or awareness of current research in the field, while primary sources are regularly used for in-depth analysis and exploration of research topics. The ways of conducting research in the humanities are diverse and often haphazard, and researchers frequently dig out textual references from primary sources and review archival collections item-by-item (Chassanoff, 2013). Humanities scholars often focus on primary sources, but when they do need secondary sources, they tend to use books over periodicals (Ge, 2010).

Traditionally, it seems that humanities scholars have preferred print resources rather than electronic ones in deciding and developing research topics (Dahl, 2013). However, recent studies suggest this is no longer the case. Toms and O'Brien (2008) found that web search engines are used as regularly as library catalogues and other finding aids to locate primary and secondary resources. Ge (2010) and Barrett (2005) have both emphasised that the use of e-resources in the humanities is increasing, particularly among junior researchers, such as doctoral students. Studies by Adema and Rutten (2010) and Tahir *et al* (2010) have found that humanities researchers are increasing their use of e-resources along with print resources, while Levine-Clark (2007) found that humanities graduate students understand the library e-book services better than students in other disciplines. They are willing to use e-books and are comfortable with accessing them and using the search features (Levine-Clark, 2006; Quan-Haase and Martin, 2011). However, the increasing use of e-resources is probably due to their availability and ability to meet the students' information needs (Toms and O'Brien, 2008).

The academic library is described by Tahir *et al.* (2010) as a laboratory of humanities. Humanities researchers regularly fulfil their information needs by using the library and their personal collections (Tahir *et al*, 2010). Reference books and the library catalogue have been identified as the most important information sources humanities students' use for their research, while the preferred method for gathering information is consulting experts in their subject area and conversations with colleagues. They prefer to use print materials and make less use of audio-visual materials (Tahir *et al*, 2008). Although more e-resources are available at the library and via the Internet, they are less important than might be expected. The accuracy of e-resources is a concern for some senior humanities scholars, such as supervisors, and they do not accept citations of electronic versions in students' theses. In addition, accessibility is not a key factor in using e-resources for humanities graduate students. They do not depend heavily on e-resources and obtain most of the necessary documents from the library's print collection (Wu and Chen, 2010).

After reviewing the literature published from 1996–2008, Tahir *et al* (2010) concluded that the library is the main source used by humanities scholars to seek information. Books and journals are most preferred for research, and print books are preferred over electronic ones. However, the widespread IT has attracted them. The Internet, online catalogues and online bibliographic and full-text databases are regularly used. Those in the humanities are comparatively late in adopting IT and mostly use it to search for secondary sources. They believe in the value of e-resources for their research, but a major barrier preventing them from using the technology is

the lack of availability of the desired resources. Humanities scholars are unskilful in using information and communication technology (ICT) and require training.

In order to examine the use of e-resources by humanities researchers in the digital age, Ge (2010) conducted a study at Tennessee State University (TSU) that identified several factors underlying the low use of e-resources by humanities' graduate students. These factors include:

- a) Lack of accessibility: unavailability of the required sources or difficulty in using the library information system;
- b) Research topic and disciplinary restrictions: humanities topics require less use of digital resources.
- c) Source quality: humanities researchers are not confident that e-resources can provide accurate, reliable and high-quality information.
- d) Lack of awareness: an unawareness of the relevant e-resources provided by the library limits their use (e.g. specific databases or websites).
- e) Personal constraint: some users believe they are too old to learn how to use e-resources or that it is too difficult.

Wu and Chen (2010) studied the impact of e-resources on humanities graduate students' theses at National Taiwan University (NTU) using interviews with 20 students following a citation analysis of their theses. The study reveals that humanities graduate students regard the library as their primary source when finding information for their research. They use the library's OPAC, database and Google tools to retrieve information. If an item is unavailable in the library, they obtain it in other ways, such as requesting it via the ILL service, borrowing it from a supervisor or buying it themselves. Local libraries and libraries abroad are another possible way to acquire documents that are unavailable in students' university libraries.

Overall, the studies reviewed showed that:

- Academic libraries are the main source used by humanities scholars to locate information.
- Web search engines and the library catalogue are used regularly to locate primary and secondary sources.
- If the item is unavailable in the library, humanities students use several other methods to obtain it, such as ILLs, borrowing it from a supervisor or buying it themselves.
- The preferred source for gathering information is consulting experts in the field.

- Print materials are preferred and are used more frequently than electronic ones.
- The use of e-resources depends on their availability and ability to meet humanities scholars' information needs.
- Humanities scholars are unskilful in using IT and require training.

The section below will review the scholarly works related to historians' information use and behaviour.

### 2.5.3.1 History students' information use

Historians are a unique group of scholars in terms of their information use and behaviour. Their use of manuscripts as a primary source and books and journals as secondary sources means that their actions have been greatly altered by the recent shift towards digitisation (Martin and Quan-Haase, 2013). In the advent of new technology and the changing information environment, the way in which history students use primary source materials has changed. Nearly a decade ago, various studies were conducted on the information behaviour of historians using archive materials. Few studies have examined how this behaviour has changed in the electronic environment. Over the last few decades, there have been widespread changes regarding access to archival materials. Institutions now provide access to archival materials via finding aids and catalogues (Chassanoff, 2013). Warwick *et al* (2008) found that information resources, such as libraries, archives, museums, research centres and web pages, provide vital information for humanities scholars, particularly historians. They consider university library websites the most important resource for historians, even compared to Google. Dalton and Carnigo (2004) found that the application of e-resources has increased historians' use of online catalogues and indices in their effort to identify primary and secondary sources. However, history scholars acknowledge that it is difficult to find all the archival materials online (Catalano, 2013). The digitisation of primary sources and finding aids has changed many aspects of the archival search process of historians (Rutner and Schonfeld, 2012).

To explore how academic historians currently access and use primary source materials, Chassanoff (2013) surveyed faculty members and graduate students at the University of North Carolina at Chapel Hill. She found that history graduate students often begin their research in archives, usually consulting a large number of archival institutions, such as public or university libraries, academics' special collections, government archives, local historical societies and museums. The type of institution and archival materials they choose usually depends on their research topic. They often use published finding aids or consult archivists to locate primary



sources. They may begin their search by asking an archivist, who then might direct them to the online database from which they might retrieve the source. They frequently consult the library catalogue and Internet tools, such as Google, in the early stage of their research. Both print and e-resources are used. Usually, they consult periodicals, newspapers and books as secondary sources and manuscripts as primary sources. Based on their specific topics, some use photographs, oral history recordings or film and video recordings found online. It was found that history students use a combination of personal and online techniques to acquire information during their research process.

Rutner and Schonfeld (2012) interviewed 39 history professors and graduate students about their research practices. They reported that graduate students use archives for primary sources and the library for secondary ones. Although the archive remains central to their research process, the use of digital cameras has altered the way in which historians interact with archival materials; they have become more visual and less analytical. The role of the archivist is critical in their research process, and they are often involved in helping to achieve the historians' research goal. Therefore, it is important for historians to develop relationships with archivists, particularly in the early stages of their research, to facilitate access and support. Travel to archives has generally increased over time. Depending on the research topic, some history professors and graduate students travel to archives outside the country. Others travel locally to view collections of interest and seek advice from local subject matter experts. Overall, there is a consensus that it is now easier to locate, access and work with digital materials than before. The university library is still the first source for accessing secondary materials. However, historians do not limit their search to their institution's library; they keep up with current research in their field using journals, publishers' catalogues, book exhibitions and other sources. They may rely on citations, general web searches and subscription databases when exploring new topics. Generally, Google and Google Books are the most comprehensive discovery tools available on the open web. While graduate students are pleased with their campus library, they regard librarians as not deeply involved in their research process.

On the other hand, the use of e-books as a secondary source for historians has seen unprecedented growth in the past few years (Sporkin, 2012). In addition to the wide use of electronic tools by humanities scholars, the effect of e-books on historians' information use behaviour cannot be ignored (Dalbello, 2011; Toms and O'Brien, 2008). However, despite recent interest in the digital environment, the long-lasting perception that historians tend to be reluctant to adopt new technology and favour print formats continues (Goodrich-Jones, 1995).

Looking at previous studies on historians, the quick adoption of new technology has been shown to occur if it helps speed up their research process (Case, 1991; Delgadillo and Lynch, 1999).

In summary, the above-mentioned studies indicate that:

- Historians and history students use a combination of personal and online techniques to obtain information.
- They use archives as primary sources of information and the library as a secondary source.
- The role of archivists is very important, and developing relationships with archivists is essential in the early stages of their research.
- Some travel to archives outside the country and some travel locally to seek advice from experts.
- The advent of new technology has changed their ways of using primary sources (e.g. manuscripts).
- Google and Google Books are the most comprehensive discovery tools used on the open web.
- The quick adoption of new technology occurs when it helps to speed up the research process.

#### **2.5.4 Law graduate students' information use**

Studies on law students' information behaviour first appeared in the LIS literature in the 1980s. Several studies have included users of legal information resources, but most focused on professional lawyers whose work differs in many respects from that of academic lawyers (Davidson, 2010). Only a few studies have explored the information behaviour of law scholars when conducting research, either in the LIS literature or in the legal education literature, and some of these are very old (Anderson, 2011). Most of these studies are in the form of theses or dissertations (Otike, 1999). No study has explored the information use and behaviour of law graduate students in particular, even in developed countries. Understanding the information needs of law graduate students when conducting research is vital to support their work. According to Otike (1999), legal researchers use a variety of information, and their information needs in turn are influenced by the nature of their work. They appear to require two types of information:

- Detailed information: available in law journals, judgements or textbooks.
- Brief and factual information: basic data that normally takes less time to consult.

Both types of information are used by academic lawyers. They start with brief and factual information to get a basic understanding. To meet their information needs, they tend to use law books, law journals, reference books, newspapers, and law reports, with the most preferred method being consulting colleagues or personal contacts. They consult colleagues before moving on to print or electronic sources. Regarding law journals, most academic lawyers have their own collection as a quick reference source. Academic lawyers start with university libraries and then move to other sources when the library is unable to provide the required materials. They continue to rely heavily on print materials rather than electronic ones (Otiye, 1999). The availability of legal resources in libraries is among the primary factors that determine the use of law libraries (Feliciano, 1984).

Al Daihani and Oppenheim (2008) found that personal collections are the most heavily used sources by Kuwaiti legal researchers. The majority do not use electronic sources, such as databases and the Internet, possibly due to their lack of training in this regard. Large percentages also do not use the law library. The majority seek information themselves without assistance and rely on colleagues for information. They regard commentaries as a very important source of detailed information for their research. Although journals should be among the major information sources for legal researchers, the majority of them scan one or two journals. Books are the most popular source of information for their research. Newspapers rank first for serendipity for legal researchers. These results show that the legal information providers in Kuwait need to adopt new technology to satisfy the information needs of legal scholars.

Thanuskodi (2009) found that law researchers prefer print sources over library electronic ones. This is in line with the findings of Majid and Kassim (2000), while Nnadozie and Nnadozie (2008) found that monographs and journal articles are the most common information sources used by legal researchers. Burman and Sheela (2011) found that journal articles are the major information source used by Master's law students for their research, followed by books. However, Khan and Bhatti (2012) found that law researchers use computers and the Internet to search for information. They complain about the outdated stock, unavailability of required materials and insufficient provision of computers and Internet services in law college libraries. Although they utilise their law college library collection, they also develop personal collections to serve as quick reference sources for their pressing information needs.

In his study of the utilisation of information by University of Benin law students, Ossai (2011) found that most law students are heavy users of library resources throughout their academic careers. However, the study revealed that most have difficulty locating and identifying suitable library information resources for legislation and legal journal articles.

Makri *et al* (2008) showed that legal researchers use digital law libraries and e-resources. In addition, they use legal databases, such as Lexis Nexis and Westlaw (the two biggest digital law libraries in terms of cases, legislation and journal coverage) for their research. They often face difficulty in finding what they are looking for when using a digital library. The difficulty is due to their poor knowledge of the digital library system rather than their poor searching skills. They are aware that Google plays a significant role in their research process. Often, they use it as a starting point to gain an overview of a legal subject, citation or journal article (Makri *et al*, 2006; Makri, 2007).

In a recent study, Bhardwaj (2012) assessed the use of legal electronic databases in the faculty of law, University of Delhi, India, using a questionnaire. The case study revealed that the majority (95%) of Master's law students (LLM) are aware of electronic databases and use them frequently to locate case law. The main method used for learning how to use the library e-resources is their own efforts (51%), while 23.2% use the help of the library staff. Over half of the students have requested training to learn the necessary skills for using legal information systems. When asked about the various methods of training, their major response was tutorials. In 2013, Bhardwaj and Madhusudhan investigated the use of open access resources at the National Law University using the same method. It was found that Master's students frequently use Open Access legal information resources for the purpose of identifying case law, discussions based on commentaries and group discussions and debates about specific issues related to their academic research.

- In summary, there is a gap in the literature regarding the information use and behaviour of law graduate students.
- Few studies have been conducted in different countries about the library use of legal researchers.
- Most of the studies reviewed confirm that legal researchers are heavy users of information.
- They start with the library and move on to other sources when the library is unable to provide them with the required materials.

- More investigation is needed to understand the extent to which legal researchers rely on both print and online resources, including Lexis Nexis, Westlaw and other sources outside the library, and on their colleagues.
- Only one recent study assesses the extent to which legal researchers use the library database in their research work.
- The studies do not highlight the value and expertise of law librarians in the context of legal research work.
- It seems that legal researchers face difficulties in using the electronic legal information resources. Therefore, they claim they need systematic training on how to use a library's online resources.

To conclude, the literature about the information use of law graduate students is diffused across the context of information-seeking behaviour studies. Most of the reviewed studies focused not only on graduate students but also on larger group of users, including faculty members or undergraduate students. This makes it difficult for the researcher to build a coherent knowledge base. Studies on the patterns of information use mostly examined graduate students at specific universities or colleges, and some were only quantitative and small in scale. Some of the studies investigated the use of one type of information source, such as e-journals or e-books, and the effectiveness of library support and training with regard to that particular resource. Most of those studies failed to provide information about how resources are selected by graduate students or how they use those resources throughout the research stages. Although the focus has recently been on graduate students as a user group, a gap in the literature remains concerning this particular group in relation to their use of information during the different stages of research. No study has investigated the information use and behaviour of graduate students as a particular group throughout their research stages. This needs to be investigated in isolation, with a focus on the research stages, to support their research effectively. In the next section, the differences between the disciplines in terms of using library resources and services will be discussed.

## **2.6 Disciplinary differences and the theoretical frameworks**

About a decade ago, scholars such as Palmer (1999) studied how users from different disciplines gather and use information. During the last decade, several studies (e.g. Talja and Maula, 2003; Vakkari and Talja, 2005; Wang, 2006; Talja *et al*, 2007; Vakkari, 2006, 2008) have focused on disciplinary differences with regard to using information resources. While Fry

(2006a, 2006b) and Fry and Talja (2007) focused on the differences between the sub-disciplines, in a later study Krampen *et al* (2011) focused on the differences between sub-disciplines in the same fields. During the last decade, a number of studies have been carried out using a theoretical framework to study the differences between the disciplines in higher education. The most frequently cited conceptual framework included Becher's topology of disciplinary differences (Becher, 1994) and Whitley's theory of intellectual and social organisation of science (Whitley, 2000). These two theoretical perspectives will be discussed in the following sections in relation to disciplinary differences.

### 2.6.1 Becher's taxonomy

Becher (1987) argued that each discipline has a unique cultural identity based upon social and intellectual considerations. He developed a taxonomy that categorises the cultural configuration of disciplines into four groups. Table 2.1 summarises Becher's matrix of disciplinary cultures.

**Table 2-1 Becher's taxonomy (1987, p.278) of disciplinary differences**

Nature of Discipline	Soft Science	Hard Science
<b>Pure</b>	Humanities (e.g. history), pure social science (e.g. anthropology), <i>'soft-pure'</i> knowledge structure	Physical science (e.g. physics), <i>'hard-pure'</i> knowledge structure
<b>Applied</b>	Applied social science (e.g. education), <i>'soft applied'</i> knowledge structure	Applied science (e.g. mechanical engineering), <i>'hard applied'</i> knowledge structure

Source: (Fry, 2006a, p.306)

The above matrix is based on Biglan (1973) and Kolb's (1981) system, which is concerned with the extent to which knowledge structure can be classified as pure/applied or hard/soft (Fry, 2003) to identify the cultural differences between the various disciplines in terms of the role of formal and informal communication and the role of ICT in communication systems. Fry (2006 a) interviewed 30 academics from different universities in the UK representing the fields of high-energy physics, corpus-based linguistics and social/cultural geography using the domain

analytic approach and Becher's matrix to identify the nature of the researchers' information needs and information use within their scholarly community. According to Becher's matrix, the discipline of geography would be classified as a physical science. This discipline has two major areas of study, human geography and physical geography, which are divided further into specialisms. Social/cultural geography is a specialist field that has a different cultural identity from physical geography because it concerns people and their relationships with space, place and culture. Within Becher's taxonomy, Social/cultural geography falls into the pure social sciences category but share some cultural characteristics with the applied social sciences. The high-energy physics field is strictly aligned with the physical science group (Fry, 2003). However, corpus-based linguistics falls between the humanities, the pure social sciences and the applied social sciences, because it concerned with understanding the linguistic phenomena and development of products and techniques (Fry, 2006 a). Fields that fall into the same category in Becher's taxonomy (e.g both social/cultural geography and corpus-based linguistics fall into soft/pure category) can therefore have quite different styles of communication and patterns of information seeking, and fields that fall into different categories (e.g corpus-based linguistics falls into both soft/pure and hard/applied categories) of Becher's taxonomy may have similar patterns of communication and information seeking. This makes a strong case that for studies about e-resource usage, the specialist field is the most appropriate unit of analysis (Fry, 2006 a). Fry and Talja (2004) have argued that Becher's taxonomy is a useful indicator of general disciplinary differences but is limited in its usefulness as an explanatory tool due to the coarse-grained level of analysis. Therefore, Fry and Talja (2004) turn to Whitley's (2000) theory as an explanatory model of e-resource usage within specialist fields.

### **2.6.2 Domain-analytic approach**

A domain-analytic approach was adopted for the present study, based on Whitley's (2000) two analytic domain concepts of 'mutual dependence' and 'task uncertainty'. This approach was first formulated by Shera (1972, p.112) and focuses on 'problems in the theory of knowledge' that, according to Hjørland and Albrechtsen (1995, p.411), are 'more fundamental than knowledge about the users of information'. Ørom (2000) has argued that the theory of Hjørland and Albrechtsen (1995), which states that domain analysis, offers the possibility of examining how information is used within particular social and cultural contexts can be a useful approach. Hjørland (2004, p.18) states that domain analysis 'does not conceive of users in general but sees them as belonging to different cultures, social structures and domains of knowledge'. However, Sundin (2003) has explained that Hjørland's theory does not set out directive norms about

information needs, information relevance and the practice of knowledge organisation. The domain-analytic approach, as indicated by Hjørland (2004), can be used as an important theoretical addition to other research approaches. However, Fry and Talja (2004) have argued that this approach needs to be extended to create a more complete understanding of the cultural characteristics of various fields, both sociologically and epistemologically.

Whitley's theory (2000) is popular as it integrates both the epistemic and the social consideration of scientific fields into a single explanatory framework and helps extend the domain analytical approach in information science. It can be used as a powerful analytic tool for understanding information use across disciplines. Fry (2006a) has argued that the major differences between disciplines can be characterised in terms of their degree of 'mutual dependence' and 'task uncertainty'. The explanatory strength of these two concepts is that together they integrate social and cultural considerations into a unified framework. As indicated by Fry (2006a), the strength of Whitley's theory in investigating the differences in information use across disciplines compared to the analytic domain approach proposed by Hjørland and Albrechtsen (1995) is that it accounts for how science can be organised according to the influences on the research process through the interrelated aspects of 'mutual dependence' and 'task uncertainty'. Looking simultaneously at the social and epistemic structure allows the researcher to understand the mutual relationship between the specific cultural characteristics of the scientific field and the use of information throughout the research process. Therefore, the researcher has suggested that Whitley's theory can be effectively used as an explanatory model for the differences between disciplines regarding information use throughout the research process (Fry and Talja, 2004). The application of this theory to predicting the pattern of information use during research can help guide the provision of research resources to meet the information needs of graduate students (Fry, 2006a).

### **2.6.2.1 Whitley's theory**

Whitley (2000) argued that the nature of intellectual fields can be described based upon the variations of the two key domain analytic concepts of 'mutual dependence' and 'task uncertainty' (Fry, 2006a). 'Mutual dependence' refers to the degree of dependency of the scientific field on knowledge produced by other fields to make a competent and significant contribution to science and also includes the degree of dependency between groups and individuals within a field. For example, there is great variation across specialised fields in which scientists are required to show how their work is connected to other fields. In fields with a high degree of 'mutual dependence' (e.g. high-energy physics), at the individuals level,



scientists become more reliant upon particular groups of colleagues for building a reputation and to access resources to achieve a collective goal. ‘Task uncertainty’ relates to the degree of visibility and predictability of task outcomes, research procedures and the clarity of articulated goals shared between researchers (Fry and Talja, 2007). For instance, in fields with a high degree of ‘task uncertainty’ (e.g. sociology), scientists are uncertain about how to structure research problems, structure research procedures and predict research results, as they make diffuse contributions to achieve a broad intellectual goal (Talja *et al*, 2007). These two explanatory variables are interrelated and comparative. Whitley further divides ‘mutual dependence’ and ‘task uncertainty’ into two sub-categories, strategic and functional dependence and strategic and technical uncertainty. This results in a four-cell matrix. ‘Strategic dependence’ refers to the degree to which research programmes and task outcomes are coordinated across research sites. ‘Functional dependence’ refers to the degree to which researchers have to use the specific results, ideas and procedures of fellow specialists to construct knowledge claims (Whitley, 2000). The consequence of increasing the degree of ‘strategic dependency’ is greater reliance upon a particular group of colleagues for accessing materials (Fry, 2006b). Within the ‘task uncertainty’ dimension, ‘strategic uncertainty’ refers to the degree of uncertainty of scholars about the importance of research topics, their preferred methods for tackling them, their intellectual priorities and the task outcome, whereas ‘technical uncertainty’ refers to the degree to which common technical procedures are used in research (Fry and Talja, 2007). The consequence of increasing the degree of ‘technical uncertainty’ is greater reliance upon individual and direct control of how research is carried out (Whitley, 2000).

Fry (2006 a) conducted a study using Whitley’s theoretical framework and grounded theory as an analytical approach. The study showed that each case study used digital resources in a different way. Disciplines with a high degree of ‘task uncertainty’ were less successful in taking control of the channels of communication, whereas fields with low ‘task uncertainty’ readily coped with digital information resources. These findings revealed that the use of digital resources is significantly influenced by the way in which the scholarly disciplines control research problems and strategies. Furthermore, this study showed that Whitley’s theory can be used as an explanatory framework for understanding similarities and differences in the use of information resources across disciplines.

To explore the applicability of Whitley’s theory in explaining and understanding the differences between the domains in shaping digital resources, Fry and Talja (2007) conducted a study

covering seven fields in the form of qualitative case studies. The study combines data from two independent studies conducted by Talja (2002) and Fry (2006), both of whom used the same thematic analytic approach. The two studies were similar enough that a wide comparative analysis could be used to synthesise the findings. The fields studied by Fry (2006) were high-energy physics, social/cultural geography and corpus-based linguistics, while Talja (2002) investigated environmental biology, nursing science, history, literature and cultural studies. Fry and Talja (2007) concluded that the nature of the disciplines, their social structure, degree of integration and the nature of knowledge produced has great influence on shaping the studied fields' communication practises. A high degree of 'mutual dependence' plays a central role in shaping the design and use of e-resources (e.g. high-energy physics), while a high degree of 'task uncertainty' results in the heavy reliance of the studied field on formal print publications (e.g. social/cultural geography). In addition, this study confirmed that Whitley's domain analytic concepts offer a powerful approach for understanding and explaining the differences between the disciplines in shaping scholarly communication in environments where networking is critical.

The advantage of Whitley's matrix over Becher's taxonomy is its thoroughness in explaining the multi-dimensionality of the scientific field. The emphasis of Whitley's matrix on the degree of either 'mutual dependence' or 'task uncertainty' allows for more fine-grained analysis, which can be applied at a number of levels of granularity, including the specialist field. Therefore, Whitley's theory is more effective in explaining the disciplinary differences across the specialised fields (Fry and Talja, 2004). Whitley offers an encompassing approach to explain both the intellectual and social organisation of science<sup>1</sup>. Moreover, Whitley's theory is relevant to the current research because it allows insight, investigation and interpretation of the intellectual and social development of information use concepts within scientific fields (Fry and Talja, 2007; Talja *et al*, 2007; Krampen *et al*, 2011). Therefore, the researcher suggests that using Whitley's theory in this study can be a powerful analytical tool for understanding the differences between the disciplines in shaping the information use and information behaviour of graduate students during their research stages.

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<sup>1</sup> According to Whitley (2000), sciences refer to systems of knowledge production that vary in their intellectual and social organisation.

The following section shifts from a theoretical perspective based on a conceptual framework to studies that focus on disciplinary differences related to information behaviour and use. A detailed account of these studies is presented below.

### 2.6.3 User studies of disciplinary differences

Most of the studies that investigate graduate students' information behaviour and use of e-resources have found differences between science students and humanities students. Table 2.2 summarises the studies focusing on the effect of disciplinary differences on information behaviour and preferences with regard to resources.

**Table 2-2 Studies on the effects of disciplinary differences on information use**

<b>The study</b>	<b>Scope</b>	<b>Findings</b>
<b>Urquhart (2003)</b>	Highlight trends in <i>JUSTEIS</i> report	Among the disciplines, arts and humanities students use the database least. Science students make the most use of e-journals.
<b>Ge (2005)</b>	Information-seeking behaviour in the Internet age	E-resources are used less in the humanities than in the social sciences. Those in the humanities tend to rely on print resources more.
<b>George et al (2006)</b>	Graduate student information behaviour related to research activities	<ol style="list-style-type: none"> <li>1. Use of non-library Internet: 50% in humanities, 39% in computer science.</li> <li>2. Use of library database in the arts and architecture is 50% and is 95% in the humanities.</li> <li>3. The majority (82%) reported using print resources; 85% in science and the humanities use print materials vs. 80% in the humanities.</li> <li>4. Arts students find the quality of information on the Internet to be less reliable for their research topic.</li> </ol>
<b>Gardiner et al (2006)</b>	Information behaviour of academics in the digital age	<ol style="list-style-type: none"> <li>1. English majors use print resources and tend to have the lowest use of e-resources.</li> <li>2. Computer science students make great use of e-resources and the least use of print ones.</li> </ol>
<b>Liu (2006)</b>	Exploring the extent to which graduate students use print and e-resources	E-resources are more frequently used than print resources across all disciplines.
<b>Voorbij and Ongering (2006)</b>	Experience of faculties with e-journals	75% of scientists have moderate or extensive experience with e-journals compared to less than 40% of humanities researchers

<b>Kemp and Jones (2007)</b>	Disciplinary differences in the academic use of digital resources	Subject area is a significant factor affecting the use of digital resources between disciplines.
<b>Sadler and Given (2007)</b>	Exploring graduate students' expectations about library services	Engineering and science graduate students view the shift towards using e-journals as positive, whilst humanities students perceive a dependence on technology as problematic.
<b>Chu and Law (2008)</b>	Search expertise of research students in different disciplines	Engineering students use a specific database, while education students use a more general one.
<b>Jamali and Nicolas (2008)</b>	Difference in information-seeking behaviour among the sub-fields	Information use behaviour varies within the disciplines.
<b>Xie and Joo (2009)</b>	Explore types of factors influences resources selection.	Selecting information sources is affected by students' information needs and source accessibility.
<b>Tenopir <i>et al</i> (2009)</b>	Influence of disciplinary differences on information-seeking patterns of academics	Journals are the primary source relied on by the engineering and science disciplines. Those in the humanities use books, manuscripts and primary materials.
<b>Al-Muomen (2009)</b>	Information-seeking behaviour of graduate students in different disciplines	<ol style="list-style-type: none"> <li>1. Science students use e-resources (e.g. e-journal, databases) more than arts and humanities students and fewer print materials.</li> <li>2. Engineering students use theses and dissertations, the least, while education students make great use of them.</li> <li>3. Science students make more use of the library's computerised system and have a more positive attitude towards library services than arts students.</li> </ol>
<b>Vezzosi (2009)</b>	Information behaviour of graduate students in biology	The availability of different types of resources (e.g. e-journals) in a field could influence the information use behaviour of researchers in that field (e.g. microbiology graduate students tend to rely heavily on specialised journals for their research).
<b>Gowda and Shivalingaiah (2010)</b>	Information-seeking behaviour of researchers	Disciplinary differences with regard to preferences for information channels, literature searching and the purpose of library visits

<b>Al-Aufi and Genoni (2010)</b>	Disciplinary differences regarding the use of online resources for research	Science scholars use e-resources for research more than humanities scholars.
<b>Niu and Hemminger (2011)</b>	Factors affects information-seeking behaviour of academic scientists	The type of discipline has a strong effect on the researcher's frequency of using books, journals, conference proceedings and web pages. Engineering researchers make less use of books and journals but more use of conference materials compared to scientists.
<b>Kayongo and Helm (2012)</b>	The extent to which library collections meet graduate students' needs	The use of resources varied between different disciplines. Science and engineering students use journals more than books, while arts and humanities students use books more than journals.
<b>Catalano (2013)</b>	Information-seeking behaviour of graduate students	<ol style="list-style-type: none"> <li>1. Differences in research topics can play a role in the variation of information use behaviour across different disciplines.</li> <li>2. Scientists are more reliant on e-resources, whereas historians rely on archives or other special sources.</li> <li>3. Those in engineering prefer the current information provided by periodicals.</li> </ol>

It is evident from Table 2-2 above that the knowledge domain, the nature of the discipline and the research topic affect the ways in which researchers use information. Some studies adopted a broader approach by examining all the disciplines at their institutions, while others focused on a limited set of disciplines. It can be inferred from the studies described in Table 2-2 that those in the arts and humanities make the greatest use of print resources and the least use of electronic ones, while those in the sciences rely heavily on e-resources, such as e-journals and databases, and less on print resources.

Regarding Arab countries, few studies have focused on how disciplinary differences influence the use of information resources by academics, particularly e-resources. Only three studies (Ibrahim, 2004; Al-Muomen, 2009; Al-Aufi and Genoni, 2010) have identified differences between the disciplinary groups with regard to using e-resources. The study by Al-Muomen (2009) shed light on the use of e-resources by graduate students in the Kuwaiti context. The findings revealed that arts and humanities students are more reliant on print resources than science students, while science students are more active users of the library's electronic resources than arts and humanities students. However, because of the nature of their Master's

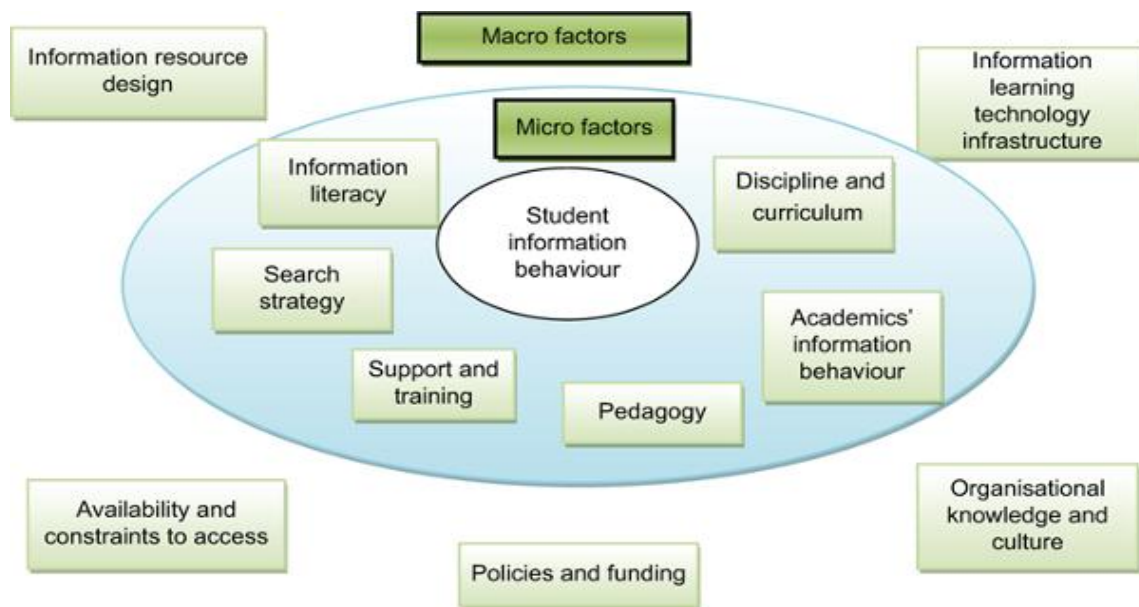
programmes (which are based more on course work, exams and projects than on dissertations), engineering students use these less than students in other disciplines. Female graduate students are more likely to search for information in the library than their male counterparts, and part-time students are more likely to search for information from their offices or homes.

Al-Aufi and Genoni (2010) investigated the use of online resources in the Omani context from a multi-disciplinary perspective. The study revealed significant disciplinary differences regarding the use of and attitudes towards online resources at Sultan Qaboos University (SQU). These results can be compared with those of similar studies conducted elsewhere.

In summary, it is evident from the review of the studies that the discipline has a significant effect on the information use behaviour of end users. The knowledge domain, the nature of the discipline and the subject area influence how researchers use information. The following section reviews the literature with respect to the factors affecting the information use and behaviour of graduate students throughout the research process.

## **2.7 Factors affecting the information use and behaviour of graduate students**

A number of factors influence the information use and behaviour of students. A study by Urquhart and Rowley (2007) on the information behaviour of students in the electronic environment at UK universities (e.g. community colleges) resulted in the development of a non-sequential model that identified factors that can be used as variables for future research. This model has the advantage of bringing together both micro (individual) and macro (organisational) factors that influence students' information behaviour in the academic context. According to the authors, individual factors are those that have a direct impact on the information use and behaviour of students (e.g. pedagogy, discipline and curriculum, information literacy; support and training; search strategies and academics' information behaviour). Organisational factors have to do with the context in which students' information use and behaviour occurs (e.g. the information and learning technology infrastructure; availability and constraints to access; organisational leadership and culture; information resource design and policies and funding). The macro factors would mostly be constant if the focus is on one educational institution. Figure 2.2 illustrates the information behaviour model, which shows various micro and macro factors that influence the information use and behaviour of students.



**Figure 2-2: Information behaviour model (adopted from Urquhart and Rowley, 2007; 1190).**

*(Reproduced with the permission of the key author, Christine Urquhart (see Appendix 9A))*

Micro and macro factors may interact in a complicated way. Not only do macro factors influence micro factors, but specific micro factors also interact. For instance, different disciplines have different ways of knowing, which impacts the type of learning and teaching strategy adopted by the academic staff. The interaction between pedagogy and discipline affects the specific information behaviour of the students. Therefore, the complex interaction between the various macro and micro factors governs the information use of the students (Urquhart and Rowley, 2007). In the present study, this model has been used as a framework to explore the factors that may influence the information use and behaviour of graduate students in the Kuwaiti context. The specific factors chosen to be the focus of the current study and that require further analysis and discussion are listed below:

- The culture of the discipline
- The role of academics
- Availability and accessibility issues
- Training and library support
- Cultural aspects

These factors appear to be closely related to the research, the aim of which is to investigate the factors that influence the information use and behaviour of graduate students. Moreover, these

factors are the most common issues in the literature relating to the use of information resources by graduate students. Regarding the use of electronic services in general, such factors depends on focus on individuals and their reasons for choosing the source. As the element of individual choice is influenced by the context, the present study allows the exploration of new factors that shape the information use and behaviour of graduate students in the context of KU. The section below consists of a detailed discussion of the chosen factors.

### **2.7.1 The culture of the discipline**

Discipline can be defined as ‘the area of study and in the way in which knowledge and skills development is structured in a learning experience’ (Urquhart and Rowley, 2007). User studies have shown that the discipline influences the information use and behaviour of students. Therefore, any investigation of information use and preferences should be carried out within the context of particular user groups. It is important to address the major elements of the environment in which the user group functions, including the characteristics of the group, the atmosphere in which they function and the types of problem they encounter (Zach, 2005).

Regarding the different contexts of user groups, a longitudinal study conducted by RIN (2011) using a survey, focus group and interviews found that information searching dominates humanities graduate students’ research work. For science graduate students, however, less information searching is required due to their greater dependency on lab work and experimentation; therefore, managing the references is a smaller task. However, not all humanities research falls within a supervisor’s area of expertise/interest, as happens in science research. Therefore, research students in science are more likely to work as part of a team with their supervisors, while humanities students tend to work autonomously.

In the Arabic context, the language used in teaching and researching the discipline affects the use of e-resources. In the Arab world, as indicated by Al-Aufi and Genoni (2010), the disciplines are divided by language. The science disciplines are taught in English, and the humanities and social sciences are taught in Arabic. This presents a challenge with regard to using e-resources across disciplines that use the Arabic language. The results suggest less reliance by humanities and social science scholars on Internet-based sources of information due to the under-representation of Arabic on the Internet and in other online information sources.

The section above showed that the culture of the discipline has an impact on the information use and behaviour of graduate students. Cultural elements, such as the research language used by the discipline, have a greater impact on the use of e-resources.



## 2.7.2 Role of academics

The role of supervisors as an information source affects students' information use. Supervisors always play a role as models and mentors for students in terms of how to use information resources. The students' choice of information resources might be explicitly influenced by the recommendations of their supervisor about using specific resources (Urquhart and Rowley, 2007). Some graduate students need training by their supervisor on using e-resources, due to the supervisor's competence in searching for subject-specific information (Barry, 1997). A number of studies show that students look to their supervisors to guide them and improve their information skills. For example, a study conducted by Williamson *et al* (2007) at Monash University in Australia concluded that supervisors guide students on how to locate information resources.

Dingley (2010) studied over 1,300 graduate students at Cambridge University and found that supervisors are perceived as the most common source of advice on information searching and the second most popular source of advice on managing and gathering information. In 2010, the first annual report of British Library and Joint Information Systems Committee (BL/JISC), *Researcher of Tomorrow*, concluded that 'Generation Y' graduate students are heavily influenced by their supervisors, particularly with regard to selecting and using information resources for their research. The second BL/JISC annual report in 2011 confirmed that supervisors influence graduate students' behaviour with regard to the adoption of the latest IT.

RIN (2011) investigated the influence of supervisors on the development and use of graduate students' information skills based on the conclusions of their 2008 report *Mind the skills gap*. Although the graduate students were found to be consistent in perceiving their supervisors as key sources of information and guidance, the qualitative data revealed that there are major differences at the departmental level with regard to the training support provided. For example, in the discipline of law, supervisors encourage students to be autonomous and provide support only when needed. However, in science (microbiology), the role of supervisors is to help students devise experiments. In the discipline of history, supervisors guide students about where to find information. However, Johnson (2013) found that dissertation advisors in the engineering discipline might be involved in the information use process but are not necessarily aware of what resources are available in the library. They play a key role in guiding graduate students towards finding the type of information sources to be used. Help with conducting comprehensive information searches is ranked as the top characteristic of supervision by the graduate students (RIN, 2011).

A study carried out by Wu and Chen (2010) in Taiwan confirmed that supervisors play an important role as information provider for humanities graduate students because mentorship is a respected tradition in Taiwan and in the rest of Asia. Supervisors usually have a strong desire to help. Therefore, they often choose their students' research topics and supply them with relevant bibliographic references as a starting point. They also lend students documents from their own personal collections if not available at the library. Students seek various types of guidance from their supervisors, who play a key role in their social network. This supports the findings of Barrett (2005) and George *et al* (2006), which confirmed that professors play a vital role in graduate students' information use and behaviour.

Al-Muomen *et al* (2012) found that academics at KU influence their students' information use and behaviour. Over half of the students indicate that their tutors recommend journal articles by well-known authors and guide them in projects that require them to use information resources in the library. They encourage them to explore a wide range of information resources held by the library and to make effective use of all library resources. In addition, most academics offer guidance on literature searching. This also supports the findings of Barrett (2005), Kerins *et al*, (2004), Serotkin *et al*, (2005) and Tenopir (2003). The results of the interviews suggest that academics are aware of their role in enhancing the information literacy skills of their students. In general, it was found that there is confusion among academics and librarians about their expected role regarding students' information skills.

The section above reviewed the studies relating to the influence of supervisors on graduate students' information use. The students' choices of information resources are often influenced by supervisors' recommendations. The studies indicate that supervisors might play a role in improving the students' information skills. However, there are major differences at the departmental level regarding the training support provided by supervisors.

### **2.7.3 Availability and accessibility issues**

The accessibility of information sources is an important issue related to the use of information sources by students. Resources may be available in the library and may be identified bibliographically, but the students may be unable to locate them. This affects decisions about source selection significantly (Aguolu and Aguolu, 2002; Foster and Urquhart, 2012). Information resources encompass a variety of print resources and e-resources. The manner in which these resources are organised and the tools used to locate information they contain are important factors affecting their accessibility (Maybee, 2006). Home-based access to library

online resources is demanded by users across all disciplines, particularly when there is heavy use of campus resources (Urquhart and Rowley, 2007). However, researchers often use the information sources that are available and that require little effort to access. The availability of the information resources needed does not mean that information is readily accessible by users (Aguolu and Aguolu, 2002; Foster and Urquhart, 2012). The following section provides an overview of the range of information resources available in higher education, with a special focus on e-resources. This section reviews studies related to the Internet and the search engine Google, OPAC and e-journals and e-books that are not widely used within the context of Kuwait, the country being studied here.

### **2.7.3.1 Electronic information resources and the constraint on access**

E-resources are used to supplement print information sources in university libraries. Over the last few decades, a considerable body of literature has examined the use of e-resources by different user groups in academic contexts. In the LIS literature, there has been a lack of consistency regarding the definition of e-resources. Some studies refer to them as ‘electronic library resources’ (ELRs), others refer to them as ‘electronic information resources’ (EIRs) (Appleton, 2006) and still others use the term ‘online resources’ (ORs) (Hughes and Bruce, 2006). Here, the term ‘EIRs’ is used.

Basically, e-resources that are accessible on the Internet are described as Internet-based resources and include e-journals, e-books, online databases, e-theses/e-dissertations, electronic conference proceedings, electronic technical reports, electronic reference documents and CD-ROM databases (Costa and Meadows, 2000; Lee, 2002; Dadzie, 2005; Appleton, 2006; Parameshwar and Patil, 2009; Swain, 2010). A number of studies investigating the issues affecting the use of e-resources and libraries (Liu and Yang, 2004; Korobili *et al*, 2006; Posada, 2006) have tended to focus on accessibility and the factors hindering or enhancing the use frequency of the Internet and the skills needed for Internet use. Several studies have investigated different aspects of EIRs, including:

- Internet availability
- The Google search engine
- Access to and use of e-journal and e-books
- Web-based OPACs

### 2.7.3.1.1 Internet availability

The Internet is described as an exciting technological tool for accessing e-resources that has brought innovation to the research process (Basque, 1995). Therefore, it is usually referred to as a global information source that contains all resources of information across every academic discipline (Nwagwu *et al*, 2009). Studies that investigate the use of the Internet in higher education in the developed world have focused on Internet use patterns and its impact on teaching, learning and research in different disciplines.

In a study carried out by Tenopir *et al* (2008), faculty members in Australia, Finland and the US were surveyed to examine their use of Internet-based resources. The study found that there is significant variation in the use of e-resources according to discipline. In Finland and the US, the medical sciences use e-resources more than other disciplines, with a score of 20.9% (with science at 16.5%, engineering at 14.4%, social sciences at 11.3% and the humanities at 7.0%). However, the findings also revealed that humanities faculty members in these three countries make the least use of e-resources. This is mainly due to the availability of the majority of science, technology, medical and social sciences journals in electronic format, unlike the situation for the humanities. In addition, humanities scholars typically read relatively fewer journal articles, even in print format, compared to their counterparts in other disciplines.

Deng (2010) studied the patterns and trends of e-resource use among all categories of staff and students in higher education in Australia and found that more than 59% of the respondents accessed and used e-resources more than once a week. According to the respondents, the basic benefit of using e-resources is their accessibility, which is not limited by time or location. The study revealed that the Internet is used to access online journals (80.5%); obtain website information (71.2%); read online newspapers (51.7%) and access e-books (31.5%).

A recent study by Shelton (2011) on the use of Internet-based resources by academic staff at UK universities has shown that 87% of the respondents use e-resources in their academic and research activities. However, the study concluded that access to and the use of Internet-based resources by academic staff is influenced by differences between cultures and research contexts.

In developing countries, most of the research on the use of Internet-based resources has been conducted in Indian and African contexts. Many researchers have investigated the extent of access to and use of Internet-based resources at Indian universities (Ali, 2005; Sanjay and Vijendrasingh, 2006; Dhamija and Panda, 2007; Rajput, 2008; Haridasan and Khan, 2009;

Sharma, 2009; Parameshwar and Patil, 2009; Madhusuudhan, 2010; Sujatha and Murthy, 2010; Swain, 2010; Kumar and Ansari, 2012).

According to Khan and Dominic (2012), the use of the Internet is vital for research at every university. They conducted a survey to assess the extent of Internet use by academic staff at engineering colleges in Moradabad, India. Their findings revealed an increasing use of the Internet in the research conducted by the respondents (Khan and Dominic, 2012). A survey conducted by Swain (2010) focused on the use of e-resources by graduate students and found that access to and the use of e-resources is common at Indian universities, therefore playing an integral part in the research process in India.

Rajput (2008) and Dhamija and Panda (2007) found that the attitude of graduate students also plays an important role in Internet use. They are likely to rely on computer-based information, depending on the Internet to collect relevant information for their research. However, Bahati and Javed (2014) found that the problems graduate students face in using the Internet include finding authentic information; the expense of subscriptions to the latest e-journals; the slow speed of the Internet and the unavailability of the Internet in their departments. They face difficulties due to a lack of search skills, a lack of time and the inaccessibility of the information required.

Parameshwar and Patil (2009) explored the electronic information environment at Gulbarga University in India in terms of Internet access. They found that the major access points to the Internet for the academics who participated in the survey are the university library (63.55%), individual departments (37.24%), Internet cybercafés (35.51%) and their homes (18.22%). This study revealed that Internet connections in the offices of academic staff are apparently lacking, thus confirming the poor electronic information environment at the university.

In the African context, recent studies seem to report increasing levels of access to and use of the Internet and e-resources (Ajala *et al*, 2010; Ani, 2010; Ani *et al*, 2010; Azubogu and Madu, 2007; Egberongbe, 2011, Emojorho and Adomi, 2006; Nwezeh, 2010; Nwokedi, 2007; Ojokoh and Asaolu, 2005; Osunade and Ojo, 2006).

Although the ICT revolution has impacted teaching and research in developed countries, Ani *et al* (2010) found that at African universities, particularly in Nigeria, Internet access is not widespread. In view of this, they investigated the extent/level of Internet access and use by academic staff at the University of Calabar in Nigeria as a teaching/research tool. The findings revealed the extensive use of the Internet by the respondents, although official access to the

Internet is reportedly low at the university. Most of the respondents reportedly lack access to the Internet in their offices and mainly use commercial Internet cybercafés off campus to access e-resources for their research.

A recent study by Nwezeh (2010) revealed there is a high-quality electronic information environment at Obafemi Awolowo University in Nigeria. The findings indicate that 95.7% of the academic staff members have a computer in their office, 56.5% have one at home, 69.6% have Internet access in their office and just 8.7% have Internet access at home. This study contradicts the findings of Ani *et al* (2010), who reported a very poor electronic information environment at the University of Calabar, where they found that only 3.08% of the respondents have Internet access in their offices.

With regard to Arabic countries, a few studies have focused on the use of the Internet in academic contexts (e.g. Al-Shanbari and Meadows, 1995; Abdullah, 1999; Boma'rifi, 2001; Al-Khezzi, 2002; Bin-Alsabti, 2003; Al-Mansori and Mohsen, 2003; Ibrahim, 2004; Rehman and Ramzy, 2004a, 2004b; Abdul-Aziz, 2005; Abdulla, 2005; Alasmari, 2005; Al-Ansari, 2006). Most of these studies are outdated and do not provide a clear picture of the current status of Internet use in the Arabic context. However, in the recent study *How higher engineering researchers in Libya perceive the use of Internet technology*, Elzawi *et al* (2012) established that the most important barriers preventing engineering faculty members from using the Internet at Alfateh University in Libya include the lack of access to computers, to the Internet and to specialised databases; the low speed connection and the lack of English language skills. The lack of training and support also makes the faculty members reluctant to use the Internet.

In Kuwait, only the studies by Rehman and Ramzy (2004a, 2004b) and Al-Ansari (2006), discussed earlier in Section 2.3, have investigated Internet use by faculty members. Both studies surveyed Internet use patterns and the problems hindering its effective use. In the recent study *Modelling information-seeking behaviour of graduate students at Kuwait University*, Al-Muomen *et al* (2012) found that the most important factors affecting the information use of graduate students in the Kuwaiti academic context is having access to the Internet, computers and printers. The major problems faced by the students are slow Internet connections, database connection failure and difficulties in obtaining usernames and passwords from the library for remote access (off campus).

Although the studies discussed above focused on Internet use, other research has studied the role of search engines in shaping the information use and behaviour of graduate students. The

following section focuses on Google Scholar, one of the main search engines for academic purposes.

### **2.7.3.1.2 The Google search engine**

Since 2005, a number of studies have investigated the Google phenomenon or ‘Googling’ (e.g. Brophy and Bawden, 2005; Griffiths and Brophy, 2005; Lippincott, 2005; Godwin, 2006; Head, 2007; Jung *et al*, 2008; Hartman and Mullen, 2008; Cothran, 2011; Herrera, 2011; Wang and Howard, 2012). ‘The “Google generation” is a popular phrase that refers to the generation of young people, born after 1993, growing up in a world dominated by the Internet’ (Rowlands *et al*, 2008, p.292). Students usually prefer the ubiquitous Google search engines to more sophisticated, time-consuming subscription online databases provided by the library. They search the online catalogue and other online databases at the library only after first searching Google to identify which databases might be relevant. Net generation students do not just need speedy answers but want information that will meet all their potential needs, as not all their searches using library catalogues or databases yield full-text material (Lippincott, 2005).

In a study on the role played by the general Google search engine in the information-seeking behaviour of scientists at the Department of Physics and Astronomy, University College, London, Jamali and Asadi (2010) used a mixed methods approach that included 56 semi-structured interviews and a questionnaire survey with 114 respondents (a 47% response rate), in addition to critical incident techniques. The study revealed that Google is the most commonly used tool for problem-specific information seeking. Scientists’ reliance on general search engines, particularly Google, to find scholarly articles is growing. They are increasingly relying on Google to find scholarly literature as they become more aware of the quantity of scholarly papers searchable by Google. They initially depend on a general Google search to find articles rather than focusing on searching more specialised databases for papers.

Several studies have discussed students’ preference for Google Scholar over library databases. Cothran (2011) found that Google Scholar is perceived as an easy tool to use and as useful for research and that it is the first choice of 35% of graduate students when searching for scholarly articles. Herrera (2011) showed that Google Scholar is second only to the EBSCO subscription database. It was also found that those in the science and technology and social sciences disciplines use Google Scholar more than those in the humanities.

In a more recent study, Wu and Chen (2014) examined graduate students’ behaviour and perceptions regarding their use of Google Scholar at the National Taiwan University (NTU).

The authors interviewed 32 graduate students in the humanities (10), social sciences (11) and science and technology (11). They found that graduate students use Google Scholar mainly to search for full-text documents and prefer its usability over that of library databases. The students appreciate the quality of the documents retrieved from the library's databases and regard these databases as crucial tools for finding scholarly articles. Science and technology students favour Google Scholar more than those in the humanities and social sciences. This study found that Google Scholar does not generally compete with library databases. However, it is predicted that Google Scholar will continue to attract more academic users when more scholarly documents become retrievable as collaboration with publishers increases.

#### **2.7.3.1.3 Access and use of e-journal and e-books**

Some of the studies investigated just one aspect of information sources, such as e-journals or e-books, and the effectiveness of library support and training for that particular resource. According to Egberongbe (2011), the emergence of ICT has tremendously affected how information is accessed and used by academics at Nigerian universities. She surveyed the use of e-resources by academic staff at the University of Lagos and found that 90.6% of the respondents accessed and used e-journals, the Internet (53.6%), e-books (28.6%) and online databases (17.86%), among other resources. User training was recommended as a major tool to facilitate and optimise the use of e-resources.

Sharma (2009) found the availability of e-resources is now widespread in university libraries in India and carried out a survey to determine the preferences and frequency of use of online resources among research scholars at Guru Gobind Singh Indraprastha University. It was found that the use of e-journals is relatively high among the researchers, with a high frequency of use. This shows an increasing trend towards the access and use of relevant e-resources. A similar study by Kumar and Ansari (2012) revealed the daily use of e-journals by the majority of academics in their research at Chaudhary Charan Singh University.

Zhang and Beckman (2011) conducted a study to gain a better understanding of e-book services awareness and use. They surveyed and interviewed faculty members, scientists and graduate students in the chemistry and biology departments at Indiana University, Bloomington (IUB). They found that e-books, like e-journals, are becoming acceptable among biology graduate students; 74% of the total study population are aware of the e-books services provided by the library. This percentage is higher than those reported in the literature by Levine-Clark (2006) and Shelburne (2009). The advantage of e-books over print ones is their availability 24/7. Although there is a shift in the sciences towards using e-resources, these students use print



books in addition to e-books in their research. What hinders their use of e-books is the difficulty of reading them on screen and finding them through the library's online catalogue. If users cannot find an e-book related to their research topic, they will switch immediately to Google books. Science researchers suggest increasing the communication between libraries and professors regarding e-book availability so professors can pass e-books on to their students.

Martin and Quan-Haase (2013) examined historians' attitudes about the use of e-books in their research using the interview method. They found that historians are at the beginning stage of e-book use; they are aware of their existence but have not taken full advantage of them. They show both a negative and a positive attitude towards e-book use. Many factors affect their use of e-books negatively, such as historians' traditional way of using historical resources, loss of serendipity, the cost of purchasing e-readers and e-books and the lack of availability of specific historical materials online. Convenience and speeding up the research process are the main factors that lead to a positive attitude towards using e-books.

#### **2.7.3.1.4 Web-based OPACs**

OPACs not only provide access to resources held by a particular library but also to other regional, national and international resources that are obtainable from linked libraries (Islam and Ahmed, 2011). In the developed world, OPAC is not a new innovation, as it has been in use since the late 1970s and became common in the 1980s (Tedd, 1994). Approximately 5–10 years later, OPAC started to appear in developing countries (Sirdahar, 2004). The advent of the Internet revolutionised the way in which library catalogues are used and accessed. Over the last four decades, a major evolution of OPACs has occurred; they have become much more user-friendly and have improved search features. They have also been improved to provide links to external full-text indexes, databases and e-journals via the Internet (Fattahi, 1997; Voon, 2003).

The literature review revealed a number of studies investigating the use of online library catalogues (e.g. Dinet *et al*, 2004; Malliari and Kyriaki-Manessi, 2007; Alam-Ansari and Amita, 2008; Mulla and Chandrashekara, 2009; Yusuf and Iwu, 2010; Kumar and Vohra, 2011; Fabunmi and Asubiojo, 2013). Malliari and Kyriaki-Manessi (2007) reported that 58% of OPAC users are graduate students, while 25% are undergraduates and 11% are faculty members. Their study revealed that academic disciplines do not yield any significant differences with regard to OPAC use. A survey conducted by Mulla and Chandrashekara (2009) showed that 52% of library users of engineering colleges in Karnataka, India, access OPAC within the library building, while only 10.44% access it via the Internet and only 9.34% access it remotely (on campus). Adedibu (2008) investigated the use of the library catalogue by science

students at the University of Ilorin in Kwara State, Nigeria. He found that OPAC users represent a small percentage (7.9%) of the respondents.

In their study, Yusuf and Iwu (2010) found that 61.9% of students at Covenant University in Ota, Nigeria use the OPAC to access library resources. This positive development is attributed to the compulsory training sessions organised by the university library. The study concluded that with the development of ICT and the tendency for the provision of effective library services, users should be able to access the library's OPAC from their home, office, lecture rooms or laboratories at any time before going to the library to borrow materials. Kumar and Vohra (2011) examined OPAC use by students and faculty at Panjab University Library in Chandigarh, India and found that of 190 respondents, 111 uses the OPAC occasionally, rarely or are not even aware of it.

In a recent study, Fabunmi and Asubiojo (2013) investigated the awareness and use of the OPAC by students at Obafemi Awolowo University in Ile-Ife, Nigeria. The study found that 51.9% of undergraduates and 16.2% of postgraduates do not use the OPAC at all. However, 68.7% are aware of it, but only 19.8% use it to access the library's resources. It was found that both undergraduate and postgraduate students use the manual catalogue more than the OPAC. The most common factors hindering respondents from using the OAPC are network failure and a shortage of computers.

In summary, several studies have investigated the impact of the availability and accessibility of e-resources on graduate students' information use and behaviour. The literature reviewed includes studies relating to the availability of the Internet, the Google search engine, OPACs and the accessibility of e-journals and e-books. The studies emphasised that there is a significant difference in the use of e-resources by graduate students according to discipline. However, the academic disciplines do not yield any significant differences with regard to OPAC use.

#### **2.7.4 Training and library support**

The advent of the Internet and emergence of the digital library has increased the need for information skills in academic research in terms of accessing and searching for information resources, linguistic/logical skills and judging the quality of information. Information skills training is a requirement for graduate students and faculty members to establish training strategies within the graduate supervision process (Barry, 1997). Training strategies should take into account training researchers successfully, recognising the problems encountered in using e-resources, adopting different models of library skills training, recognising the developmental

nature of training courses, the important role that supervisors play in addition to librarians, the need for training and support for the supervisors themselves, the need for academics and students to take responsibility for their learning in their area and the need for national and local institutions to formulate training policies (Barry, 1997).

Several studies have investigated the development of information skills for graduate students' research (e.g. Barry, 1997; Smith, 2003; Duke and Tucker, 2007; Chu and Law, 2007; Hoffman *et al*, 2008; Rempel and Davidson, 2008; Blummer *et al*, 2010; Harkins *et al*, 2011). Some articles in the literature have examined the need for information skills training for graduate students.

Smith (2003) emphasised that graduate students must be aware of subject-specific resources to be able to complete their research-intensive activities effectively. George *et al* (2006) found that graduate students tend to consult their advisors as the first source to locate literature. Harkins *et al* (2011) found that graduate students lack the required information literacy skills and are unaware of many library resources and services. Given that many Master' students immediately start their PhD studies, it is important that they develop the critical evaluation skills that will be expected of them as doctoral candidates (Barry, 1997). Rabin and Cardwell (2000) found that students who had attended other academic courses that integrate basic information literacy components are more familiar with the use of library resources and services than those who had not.

A number of researchers discuss the benefits of students receiving information literacy skills training (Rempel, 2010; Boote and Beile, 2005; Barry, 1997). Using focus groups, Fleming-May and Yuro (2009) found that graduate students show a lack of information literacy and overestimate their information skills. They are also hesitant to ask librarians for help, even if they feel they need it. They state that liaison librarians working through faculty advisors can be useful but are not always successful; therefore, direct contact with graduate students is recommended to develop a trusting relationship.

Eckel (2009) conducted a study of the Western Michigan University (WMU)'s College of Engineering and Applied Sciences in Kalamazoo using a citation analysis of 96 Masters' theses and 24 PhD theses. He found there is little formal training in literature searching for graduate engineering students at WMU. Some electrical engineering graduate students commented that they were completely unaware of the library's resources and services before meeting the engineering librarian. Based on the research evidence, the author established that supervisors

were no doubt aware of the fact that their graduate students were finding more of their sources via Internet search engines, but few advised their graduate students or deterred them from this practice. Engineering librarians took the initiative to help meet graduate students' needs by providing voluntary literature review workshops designed for specific disciplines, but only three students turned up. Barry (1997) documented how supervisors do not see the information skills training of their students as their responsibility. They would rather direct the students to ask the librarian rather than teach them how to conduct a literature search. Engineering librarians continue to struggle with how to effectively help engineering graduate students' supervisors teach their students the 'rules of the game' (Eckel, 2009).

Al Muomen *et al* (2012) found that graduate students at KU who attend library training sessions are often dissatisfied with their outcome and perceive the training as insufficient. However, there were more positive views in Social Sciences regarding the departmental and faculty training, particularly regarding courses offered by the LIS department. It is worth noting that in 2004; KU introduced a compulsory three-credit hour information literacy course at the undergraduate level in the College of Social Sciences after seeing the benefits of a previous course required of students majoring in biology. The course was designed to provide two equal components of basic computing skills and information literacy and became part of the general education requirement of the college in 2008 (Rehman and Al- Awadhi, 2013).

Both Manuel (2003) and Graham (2008) have stated that publicity is important to the success of information literacy workshops. They discuss similar points with regard to marketing library instruction efficiently. Both also recommended that librarians use various methods to advertise workshops and involve faculty members in the process of advertising to inspire reluctant students to attend. Graham (2008) encourages the use of non-course-related student groups in publicity efforts.

The section above reviewed the literature concerning the needs of graduate students with regard to information skills training. The reviewed studies indicated that graduate students lack the information skills required to support their research and are unaware of many library resources and services. They are also hesitant to ask the librarian for help even when they feel they need it. A number of studies have identified the benefits of receiving information literacy skills training in improving the information skills of graduate students, and some studies state that publicity is important in encouraging students to attend information literacy sessions.

## 2.7.5 Cultural aspects

As defined by Sitzman and Eichelberger (2004, p.95), cultural aspects are ‘factors related to religion, social structure (e.g. language), political/legal concerns, economics, educational patterns, the use of technologies, cultural values and ethno-history that influence cultural responses of human beings within a cultural context’. Cultural theory has been applied in LIS based on the socio-cultural Hofstede model (1986), which identifies four dimensions of cultural aspects (Liu *et al*, 2010). Hofstede’s theory of culture originated from a survey of IBM employees around the world between 1968 and 1970. Based on the data obtained, Hofstede classified countries within four dimensions: power distance, individualism/collectivism, uncertainty/avoidance and feminine/masculine (Komlodi, 2005, p.10). A detailed description of each dimension related to the information use of students is given in Table 2.3 below.

**Table 2-3 Four socio-cultural dimensions based on Hofstede’s theory (adapted from Liu *et al*, 2010, p.178)**

Dimension	Description
power distance (PD)	Power distance is the degree of acceptance of the unequal distribution of power and wealth by people in a society (Gunawardena <i>et. al</i> , 2001). Students in a higher PD culture tend to depend largely on their tutors and therefore are less likely to use information sources that differ from those recommended by their instructors (Steinwachs, 1999).
individualism/collectivism	Individualism is the tendency of the members of a society to act as individuals or members of a group, while in collective society a collaborative action dominates (Mercado <i>et al</i> , 2004). Students in a low PD and high individualism culture are encouraged to use various sources of information, as they are accustomed to independent problem solving (Steinwachs, 1999)
uncertainty/avoidance (UA)	This refers to the extent to which society feels threatened by uncertain and ambiguous situations and tries to avoid them (Bagchi, Hart and Peterson, 2004). Students with high UA tend to be largely dependent on their tutors as an information source because they perceive him/her as an expert (Komlodi, 2005), while those with low UA have a better awareness of the use of various information sources, which is considered an important skill.
feminine/masculine	Cultures that rank the feminine highly emphasise the value of encouragement, family and concern about relationships and the quality of life, while those who rank the masculine highly are more focused on competition, masculine confidence, career development and financial success (Mercado <i>et al</i> , 2004).

Despite the long tradition of studies about information behaviour in electronic environments, limited studies have investigated the effect of cultural factors on the use of information systems (Liu *et al*, 2010). Information use-related studies with a more specific focus on cultural variables, such as language and patterns of education (learning style), are discussed below, with the emphasis on the impact of culture on the use of online resources.

#### **2.7.5.1 Impact of culture on use of information**

A number of studies on culture and information use have emerged since 2005 (e.g. Hughes, 2005; Hughes and Bruce, 2006; Hughes *et al*, 2007; Liao *et al*, 2007; Liu *et al*, 2010; Waheed, 2011; Medved *et al*, 2013). There are two broad types of studies on the impact of culture on information use: empirical and analytical. However, the empirical studies are mostly comparative, for example, international graduate students compared to American or Australian students. The most common finding among these comparative studies is that linguistic differences and learning patterns seem to be the most influential factors affecting how students seek, interact with and use information. Although they differ in terms of focus, such as online information use (Hughes and Bruce, 2006) and information seeking (Liao *et al*, 2007), they all tend to use interviews as the dominant research method.

Hughes *et al* (2007) found that cultural and linguistic differences hinder effective online information use. In her culture-related information study, Hughes (2005) argues that differences in education patterns are a significant factor in terms of how international students use information. Students, who used a teacher-centred approach, such as in East Asian countries, tend to depend on textual materials and have little experience of using online resources in their research. These findings are consistent with Hofstede's (1986) results, which indicated that individuals in East Asian countries tend to have high uncertainty avoidance and are uncomfortable with unstructured ideas or situations; this confirms the high power distance of Asian culture. However, in a culture-learning related study, Liu *et al* (2010) reported that the biggest concern for Chinese students in learning seems to be language barriers. On the other hand, Hughes *et al* (2007) found that most of the difficulty faced by international students with regard to using information is related to limited vocabulary, academic and technical linguistic style and differences in teaching and learning styles in various cultural contexts.

In the recent study by Al-Muomen *et al* (2012), English language proficiency was found to be among the main cultural influences on KU graduate students' use of e-journals and searching of databases from their offices. Most Arabic databases at KU, as Al-Abassi (2007) indicated,

offer resources in English, and good English language skills are needed to make sense of the database's instructions, to use appropriate key words, to understand the search results and to evaluate the materials. Therefore, it is essential to increase the quantity and quality of the Arabic indexes and databases in the Arabic world. Another specific cultural concern reflected by the part-time students is the lack of expertise among library staff when they visit the library in the evening and cannot find professional librarians to support them. Al-Aufi and Genoni (2010) stated that the Arabic country context presents socio-cultural challenges, as the disciplines are divided by language; the science disciplines use English in teaching and research, while the humanities and social sciences use Arabic. He found that the science disciplines at SQU rely heavily on online resources compared to the humanities and social sciences. This reflects the difference between the disciplines regarding the effect of language barriers on the use of online resources.

In their information use study on the use of online resources by the arts and humanities departments at the University of Punjab in Lahore, Pakistan, Tahir *et al* (2010) found that although humanities students still prefer to use print materials, they do pay attention to e-resources. They mostly use Internet search engines, followed by web pages and e-journals. Online databases are rarely used in this field because of the language barrier, as most of the materials provided by the databases are in a foreign language. It has been argued that for humanities researchers pursuing their research in their mother tongue, e-journal use is less useful due to the language barrier, while those who conduct their research in English find using e-journals very useful (Pareek and Rana, 2013).

The section above provided a review of the studies focusing on how culture affects the information use and behaviour of those in higher education. Macro-culture theory in the literature was discussed, followed by various culture-related aspects. Overall, the studies suggested that English language, education patterns and learning styles are the main cultural variables that impact information use, particularly in developing countries.

To conclude, a number of factors impact the information use and behaviour of graduate students. Specific factors that appear to be closely related to the present study were chosen, such as the culture of the discipline, the role of academics, availability and accessibility of resources, training and support and cultural issues. The user studies reviewed have shown that not only does discipline influence the information use and behaviour of graduate students but also the role played by the supervisor as an information source. A number of studies show that students' choice of information sources might be influenced by their tutors' recommendations.

Resources may be available in the library, but the students might be unable to locate them, which may affect the source selection decision. In addition, the tools used to locate information might also affect the accessibility of that information. A considerable body of literature has examined the use of e-resources in the academic context, such as the Internet, the Google search engines, e-journals, e-books and OPACs. A number of studies (e.g. Liu and Yang, 2004; Korobili *et al*, 2006; Posada, 2006) have focused on accessibility and the factors hindering or enhancing the use of e-resources, and several studies have discussed students' preference for Google Scholar over the library database. Some studies investigated the use of one information sources, such as e-journals, e-books or OPACs, and others focused on the effectiveness of library support and training for particular resources. However, few studies have examined the needs of graduate students regarding information skills training for research. Studies on how cultural issues affect the information use and behaviour of users in higher education based on macro-culture theory were also discussed, in addition to various culture-related aspects.

To understand how university libraries have reconsidered their role to meet researchers' information needs in the academic environment, the section below will discuss the intervention services provided by academic libraries to support researchers effectively in their research activities.

## **2.8 Academic libraries' supporting role**

The main role of university libraries is to support academic learning, teaching and research. The traditional services provided by academic libraries to support research are the acquisition of materials, cataloguing and subject descriptions, as well as making those services benefit users. Due to developments in IT, new needs and types of services for researchers have emerged (Forsman *et al*, 2012). Recent studies have examined the role of academic libraries, considering the new needs of researchers in the digital age. To effectively support researchers in their research activities, libraries need to improve their relationship with researchers and to better understand their needs, hopes and expectations (Pinto *et al*, 2010). Therefore, academic libraries must consider that users' research-related service needs vary through the different stages of the research process and according to discipline, and must ensure that users perceive their role as that of 'mediator' and 'information consultant' (Du and Evans, 2011). This may entail embedding information specialists with relevant, subject-based knowledge on departmental and research teams (RIN, 2010; University Leadership Council, 2011; Association of Research Libraries, 2012; Richardson *et al*, 2012).



### 2.8.1 Role of academic librarian

The Canadian Association of Research Librarians (CARL) studied the proficiency of academic librarians by providing a useful analysis of the librarians' competency that might be applied in all technologically advanced countries. They argue that the dramatic changes in the academic environment are forcing decision makers to reconsider the library's role, even though the main role of the librarian of bringing together information seekers and sources has not changed (CARL, 2010). CARL identifies seven competencies related to librarians' supporting role in an evolving research environment, as follows: 1) foundational knowledge about librarianship, the higher education environment, scholarly communications and legal issues, such as the licensing model and copyright; 2) information literacy, including reference services, knowledge of learning models and strategies and engagement in patrons' education; 3) collections development, including the preservation of collections and archives and managing records and digital curation; 4) IT skills, for example, with regards to emerging web technology, institutional repositories and database management; 5) interpersonal skills, including writing, speaking and sponsorship skills, as well as the capability to collaborate with diverse groups; 6) leadership, including strategising to build collaborations and partnership with relevant communities and 7) professional development and research, including knowledge of the research lifecycle and basic research methods and the ability to carry out research (CARL, 2010).

The findings of CARL and the competencies necessary for librarians to engage in the research environment and build relationships with researchers are consistent with the findings of Webb *et al* (2007). They have stated that librarians should facilitate research activity by ensuring that researchers can easily access library services and have the skills to use those services effectively and that librarians should be engaged in the local research community and become accepted members by participating in the research process. Hart and Kleinveldt (2011) have stated that librarians need to be acquainted with the disciplinary differences and the different requirements of each knowledge domain and that the expectations of young PhD students might well differ from those of senior researchers. Knowledge about the information needs and information-seeking behaviour of those in different disciplines enables subject specialists to provide postgraduate students with competent service to help them reduce the amount of time spent seeking information (Nwagwu, 2012). In a small-scale study carried out at Charles Sturt University in Australia, Miller (2008) argued that librarians need to be aware of how the information needs and behaviour of researchers vary through the different stages of research.

For example, researchers need information about research funding bodies and well-known authors in their area of interest and to interact with their colleagues to develop the research problem at the proposal preparation stage.

### **2.8.2 Research support services**

Regarding the support services provided for researchers during their research life cycle, RIN studied the research support services offered by four UK universities (the University of Leicester, University College London, the University of Warwick and the University of York). The aim was to determine how effective these services are in meeting researchers' information needs. They reported that the focus of the support services was on the initial stage (proposal development) and the final stage (results dissemination and publication) of the research process. In the middle stages, where the actual research takes place, less support is reported. For example, information skills training, such as tutorials, seminars and web-based information and library instruction are provided in the initial stage at all four universities to help researchers develop their research proposals (RIN, 2010). Libraries initially provide assistance with developing the research idea via literature searches of their collections and ILL services for materials that are not readily available on the shelves (Parker, 2012).

Training courses are the most important services provided by university libraries, as suggested by the literature. For instance, information literacy training is provided to help users find and use resources and any other information relevant to their research (Sidorko and Yang, 2009). However, researchers show little interest in making use of their information skills training, especially in the initial stage of their research (RIN, 2010). To close the gap in supporting researchers through their research process, Australian academic libraries have made progress in seeking to become involved in the less visible stages of research (experimentation, data collection and analysis). Swinburne University of Technology's library established a new position to provide information management skills training to support researchers during the actual research (Parker, 2012). According to UK researchers, data management is an expected future role for libraries in supporting research (RIN, 2007).

In a recent study by the Association of Research Libraries (ARL), *Research library services for graduate students*, the leaders of ARL libraries were interviewed about the current status of graduate students' programmes. They reported that intervention groups have been set up in libraries to support graduate students when writing their dissertations and to provide them with

instruction they are not likely to get from their academic department. For example, the University of Illinois Urbana-Champaign (UIUC) provides sessions on ‘getting past writer’s block’ and ‘last mile’ services, including awareness of e-submissions, scholarly communication, author’s rights, copyright, and open access models (ARL, 2012).

An institutional repository (IR) is an example of a library-based research support service that meets the needs of researchers in managing all their publications (Parker, 2012). It can be defined as ‘a web-based database (repository) of scholarly material which is institutionally defined (as opposed to a subject-based repository); cumulative and perpetual (a collection of record); open and interoperable (e.g. using OAI-compliant software); and thus collects, stores and disseminates (is part of the process of scholarly communication)’ (Mark, 2004). Overall, research services can raise the value of a library in the eyes of scholars and university administrators when more collaboration and confidence is built between librarians and researchers (Forsman *et al*, 2012).

To conclude, this section has provided a review of recent studies focusing on the role of academic libraries in supporting users in higher education. The services provided by libraries to support researchers in their research were discussed. Overall, the studies suggested more engagement by librarians in the research environment to provide support for researchers throughout their research life cycle, particularly in the less visible stages of research.

## 2.9 Summary

The literature reviewed in this chapter concerned various themes relating to the information needs, information use and information behaviour of graduate students in the academic context. Their needs change according to the requirements at the different research stages. Graduate students’ behaviour is also affected by a set of complex influences, ranging from personal to environmental to cultural, in the course of using information for their research. These issues are the result of a combination of disciplinary requirements, the existence of online resources in higher education and the role of academics in supporting students’ research. Differences between the disciplines were identified regarding the use of information resources, particularly electronic ones, in supporting students’ research. Theoretical frameworks used to study the disciplinary differences in higher education, such as Becher’s taxonomy and Whitley’s theory, have been recognised. The role of the library in supporting graduate students in their use of information was highlighted. Graduate students in different disciplines have different needs;

therefore, librarians should understand the information needs of different disciplines to be able to support researchers in all disciplines. The majority of the studies reviewed focused on information use in the context of information-seeking behaviour. However, there is a need to investigate information use in isolation and as a separate concept in relation to how students access and select information resources. It should also be studied as part of the socio-cultural context of academic courses, the research process, the graduate students' goals and tasks, their perceptions regarding information resources and the tools available to support their research both inside and outside the academic environment.

Overall, the review reveals a gap in the literature regarding information use in light of recent changes in the digital environment, particularly in developing countries. A gap was also identified in terms of user studies relating to disciplinary differences with regard to information use. Research on how graduate students access and select online information is hard to synthesise due to these gaps. A gap has also been identified with regard to the research process in the context of information user studies. No study has yet investigated the information use and behaviour of graduate students as a particular user group in relation to the role of the library in supporting their research, either in developing or developed countries. This study is therefore necessary in order to explore the role of the academic library and its provision for supporting graduate students throughout their research activities. The findings of this study will provide a meaningful addition to the LIS literature in the area of user studies.

## CHAPTER 3 – RESEARCH METHODOLOGY

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### 3.1 Introduction

This chapter discusses the methodology of the research project, which employs a mixed-methods approach. First, the research paradigm is discussed, followed by a review of the different approaches used for the research. Next is a description of the research method, research design and research strategy of the study. The sampling procedure is then described, followed by the data collection methods used, with the focus on the use of survey questionnaires and interviews as research tools. This is followed by a discussion of the quantitative and qualitative data analysis processes. The validity and reliability of the measures used are assessed, followed by a discussion of the ethical issues. The chapter closes with an account of the challenges encountered during the study.

### 3.2 Ontology and epistemology

Research in the social sciences is highly influenced by the two major philosophies of knowledge, ontology and epistemology. These two philosophical paradigms are considered to be the two world views of what research is and how it should be carried out. Ontology is concerned with what constitutes reality and existence. This understanding of what constitutes reality impacts the research approach. For example, if reality is viewed as a set of facts waiting to be discovered, then the researcher is likely to take an experimental (quantitative) approach. However, if reality is viewed as existing through people's claims, then the researcher is concerned with the constructivist (qualitative) approach, with reality being regarded as a constructed account.

Epistemology is concerned with the nature of knowledge itself. How can we know if something really exists? If one's epistemological view reflects the idea that the world can be discovered using data then the experimental design is based on the way of gathering knowledge. If the epistemological view is that knowledge can be constructed subjectively by people, then the researcher is likely to engage in constructive research, working with the interactive construction of knowledge (Bryman, 2008).

Epistemology and ontology are about our theoretical understanding of knowledge and our view of reality. The understanding underpinning our theoretical perspective on research in turn affects the choice of research approach and methodology. Before discussing the research approaches, strategy and design, it is important to review three essential paradigms in the social

sciences, the post-positivist, constructivist and pragmatic paradigms, and discuss how they align with the ontological and epistemological perspectives. An explanation of each paradigm and justification for its selection or rejection for this study is provided in the following sections.

### **3.3 Research paradigms**

Research paradigms have a direct effect on the research approach, design and methods. They refer to a set of beliefs and feelings about the world and how it should be explored and studied (Denzin and Lincoln, 2011). The researcher's decision about which approach should be used is usually informed by the philosophical assumptions underlying the study, as the approach represents the world view adopted when conducting research (Guba and Lincoln, 2005). Understanding the philosophy underlying the research is essential in identifying the real distinction between research approaches, whether quantitative, qualitative or mixed methods (Creswell, 2014). To determine whether a mixed methods approach in the form of a case study design is suitable to address the research problem, the major paradigm related to the research methodology is discussed in the following sub-section.

#### **3.3.1 Post-positivism**

Post-positivists believe that there are theories that govern the world and that these need to be tested so the world can be understood (Creswell, 2014). They believe that observation and measurement are at the core of logical endeavour. Being objective is the most important aspect of their research inquiry, using measures to examine the relationship among variables and to explain those relationships statistically (Teddlie and Tashakkori, 2009). According to this paradigm, the role of the researcher is to provide material for the development of laws by testing the theory (Bryman, 2008). The majority of post-positivist studies are associated with the quantitative approach using an experimental design, which is regarded as an ideal way to carry out research (Creswell, 2014). The investigator works from the 'top down', from the theory to the hypothesis, and collects data with the aim of either rejecting or accepting a theory.

#### **3.3.2 Constructivism**

Constructivists (interpretivists) assume that the 'social scientist should grasp the subjective meaning of social action (Bryman, 2008, p.13). They believe that people understand the world through their experience and develop subjective meanings for objects or things. This leads to the search for a complex view rather than narrowing down the meaning to a few categories or ideas. The specific context in which people live and work is also a focus for constructivists to

understand the cultural and historical settings of participants (Creswell, 2014). In this form of inquiry, researchers attempt to make sense of meanings that are inductively developed from the data collected rather than starting with a theory. The research is shaped from the ‘bottom up’, from the individual perspective to the broad pattern and is ultimately developed into a theory (Creswell and Plano Clark, 2007, p.22). In this paradigm, the researcher’s role is recognised, and the participants together with the researcher create new constructions that to them are more sophisticated and real. This constructed knowledge can then be transferred to other contexts to enable others to determine if it fits with their experiences in their own environments (Guba and Lincoln, 1998). In this paradigm, researchers tend to use a qualitative approach, such as case studies or ethnography, as their main research method (Weber, 2004).

### **3.3.3 Pragmatism**

Pragmatism has been discussed by many people, such as Cherryholmes (1992), Murphy (1990) and Rorty (1990). Pragmatism is based on employing ‘what works’ in research, using diverse approaches and valuing both objective and subjective knowledge (Creswell and Plano Clark, 2007). Pragmatists believe that researchers’ decisions to combine qualitative and quantitative methods depend on the type of research question. The pragmatic assumption is consistent with the method used by many social sciences researchers to conduct their research (Teddlie and Tashakkori, 2009). According to Creswell (2014), pragmatism can provide a complete picture when quantitative and qualitative data are both collected sequentially in one research design, providing a complete understanding of the research problem. In this kind of study design, the researcher focuses on the problem instead of the methods and uses whatever approach works to understand the research problem (Rossman and Wilson, 1985). Therefore, pragmatism is not associated with any philosophy or social reality and attempts to answer both ‘what’ and ‘how’ questions. The researcher can use any method, technique or procedure that best fit the aims of the study (Cherryholmes, 1992; Morgan, 2007; Creswell, 2014). Thus, pragmatism opens the door for the use of multiple research methods and different forms of data collection and analysis.

#### **3.3.3.1 The pragmatic perspective as the stance of the researcher in this study**

For this study, it was decided that to take a pragmatic approach to address the research question ‘How do KU libraries support the research of graduate students?’ This decision was made because at some points during the research (in the qualitative phase), the researcher needed to

interact closely with the participants (and be subjective) to understand the complexity of the situation and to understand what library support for the students means to them. At other points (in the quantitative phase), the researcher did not need to interact with the participants (be objective), for example, when attempting to test the hypothesis to verify a theory (Teddlie and Tashakkori, 2009). Therefore, it is useful to use both quantitative and qualitative methods within one study. Post-positivists believe in the existence of a reality independent of socio-cultural factors and therefore assume that a questionnaire developed in one culture can be applied in another culture without any modifications. However, the researcher of the current study believes that people's perceptions about a phenomenon are shaped by the social, cultural, political and economic aspects of a specific context. Due to the complex situation of KU libraries, the above-mentioned factors and the context in which a certain phenomenon occurs should be considered when conducting the study. Therefore, using the post-positivism assumption alone is not useful for the present study. In contrast, the constructivist approach is able to capture graduate students' perceptions and experiences in the context of KU and acknowledges the role of the researcher who brings her own experience of the role of university libraries in supporting her research. In addition, it accepts the presence of reality in the perceptions and experiences of graduate students that are influenced by their specific environment (KU libraries). Because of the complex situation of KU libraries, this paradigm alone is not enough to provide the researcher with a complete picture about the real situation at KU. As the researcher collected both quantitative and qualitative data in a single study, this has the advantage of strengthening the study and providing the researcher with a complete understanding of the phenomenon under investigation. Therefore, the epistemological position for this research is assumed to be pragmatic. At the same time, the current study can be characterised as having a constructivist approach, whereby the researcher relies heavily on the qualitative method. An overview of the study design is illustrated in Figure 3.1 in Section 3.5. Before considering the research design and strategy, the different approaches used for this research will be discussed in the following sections.

### **3.4 Research approaches**

In line with the research paradigms discussed in Section 3.2, there are three broad approaches to consider when selecting an appropriate methodology: quantitative (aligned with the post-positivist paradigm), qualitative (aligned with the constructivist paradigm) and mixed methods (aligned with the pragmatic paradigm) (Denscombe, 2007; Bryman, 2008; Berg, 2009; Creswell, 2014). The term 'methods,' refers to 'the techniques that researchers employ for practising their crafts'. This may include 'instruments of data collection like questionnaires,



interviews or observation’, sampling techniques and tools employed in the analysis of data, which may involve ‘statistical techniques’ or emerging themes from ‘unstructured data’ (Bryman, 2008, p.161). Researchers must take into account the nature of the inquiry, the nature of the research population and the kind of research questions to which answers are sought (Cohen *et al*, 2007; Bryman, 2008; Berg, 2009; Creswell, 2014).

### **3.4.1 The quantitative approach**

For this study, a quantitative approach was selected for the first phase, in which questionnaires are the method of collecting quantitative data. This approach was used to produce measurable, objective data and facts about the situation in KU libraries, which could then be analysed using statistical methods. In the case of this research, it seemed more practical to adopt a deductive, quantitative approach, as there was limited time available to conduct this phase of the study. Using quantitative approaches can have many benefits; they allow us to make inferences about a large group by studying a relatively small number selected from the large group (Bryman, 2008). For this study, using a questionnaire enabled the collection of a large quantity of data, about which generalisations could then be made.

### **3.4.2 The qualitative approach**

For the second phase of the study, a qualitative research strategy was used to explore individuals’ own perspectives regarding the research phenomenon under investigation (the role of KU libraries in supporting graduate students’ research) (Creswell, 2014). The qualitative research technique adopted was the individual in-depth, semi-structured interview. Collecting text data can help to explore the participants’ views in greater depth to obtain a fuller picture of the KU libraries’ real situation.

### **3.4.3 The mixed methods approach**

In this study, the distinctive feature of the design is that a deductive (starting with a theory), quantitative approach was employed first and was used to inform the inductive (building theory from the data), qualitative approach (Gorman and Clayton, 2008) to provide a fuller picture of the real situation of KU libraries regarding their role of supporting graduate students’ research. The mixed methods approach involves the use of both quantitative and qualitative methods. It can be defined as ‘research in which the investigator collects and analyses data, integrates the findings and draws inferences using both qualitative and quantitative approaches and methods in a single study or program of inquiry’ (Tashakkori and Creswell, 2007, p.4). Using more than

one method has the advantage of providing a fuller or more complete picture of the phenomenon being studied because the questionnaire alone cannot provide the same depth of information as semi-structured interviews (Denscombe, 2007). Therefore, researchers tend to combine the quantitative and qualitative approaches when they cannot depend solely on either (Bryman, 2008). They choose approaches, as well as variables and units of analysis, that are most appropriate for finding an answer to their research questions (Tashakkori and Teddlie, 1998). As Bryman (2006, p.101) argued, ‘several researchers have pointed out that quantitative and qualitative research can be combined at different stages of the research process: formulation of research questions; sampling; data collection and data analysis’. The conclusions drawn from this mixed methods approach improve the quality of the research (Gorman and Clayton, 2008). In order to address the research question of this study, different methodological approaches have been studied and evaluated. This study used a mixed methods strategy to explore in-depth the situation in KU libraries in the form of a single case study. Mixed methods enabled the researcher to obtain a better understanding of the phenomenon and to bring together comprehensive details about the complex topic of inquiry. Therefore, both quantitative and qualitative approaches were used, whereby the findings of one method were used to explain the results generated by the other. Table 3.1 shows how quantitative and qualitative approaches combine in a mixed methods research design.

**Table 3-1 Quantitative and qualitative approaches combined into mixed method research design.**  
 Adapted from: Creswell, 2014; Creswell and Plano Clark, 2007; Hancock and Algozzine, 2006;  
 Hoepfl, 1997

Items		Quantitative approach	Qualitative approach	Mixed methods approach
<b>Philosophical assumptions</b>		Post-positivist	Constructivist	Pragmatic
<b>Purpose</b>		Test theory deductively to accept or reject it	Understanding the meaning individuals give to a phenomenon inductively	Integrate the data at different stages of the inquiry to present a visual picture of the study
<b>Strategies</b>		Survey and experiment	Phenomenology, grounded theory, case study, etc.,	Sequential, concurrent, parallel or transformative
<i>Process</i>	<b>Data collection</b>	Numbers From many participants at different sites	Words and images From few participants at few sites	Uses both numbers and words to provide stronger evidence for a conclusion
	<b>Data analysis</b>	Numerical statistical analysis, reject or accept hypothesis	Thematic or content analysis of text or images	Uses both statistical and text analysis to increase generalisability
	<b>Report findings</b>	Findings are independent of the researcher and can be generalised	Findings can be described in rich detailed phenomenon as they are situated in a local context	Combining different methods through the convergence and corroboration of the findings
<b>Advantages</b>		<ul style="list-style-type: none"> <li>• Uses an unbiased approach by employing a statistical procedure</li> <li>• Tests a hypothesis before the data are collected</li> <li>• Less time-consuming</li> </ul>	<ul style="list-style-type: none"> <li>• Conducted in a natural setting and focused on the participants' meanings and views</li> <li>• Can conduct a cross-case comparison, and data collection and analysis are interconnected</li> </ul>	<ul style="list-style-type: none"> <li>• Answers a broader, more complete range of research questions</li> <li>• Collecting both quantitative and qualitative data strengthens the research</li> </ul>
<b>Disadvantages</b>		<ul style="list-style-type: none"> <li>• Validity and reliability issues</li> <li>• Using theories might affect the population's understanding</li> </ul>	<ul style="list-style-type: none"> <li>• Researcher might influence the findings</li> <li>• Time-consuming</li> </ul>	<ul style="list-style-type: none"> <li>• Difficult for a single researcher to use more than one method at the same time</li> <li>• More expensive and time-consuming</li> </ul>

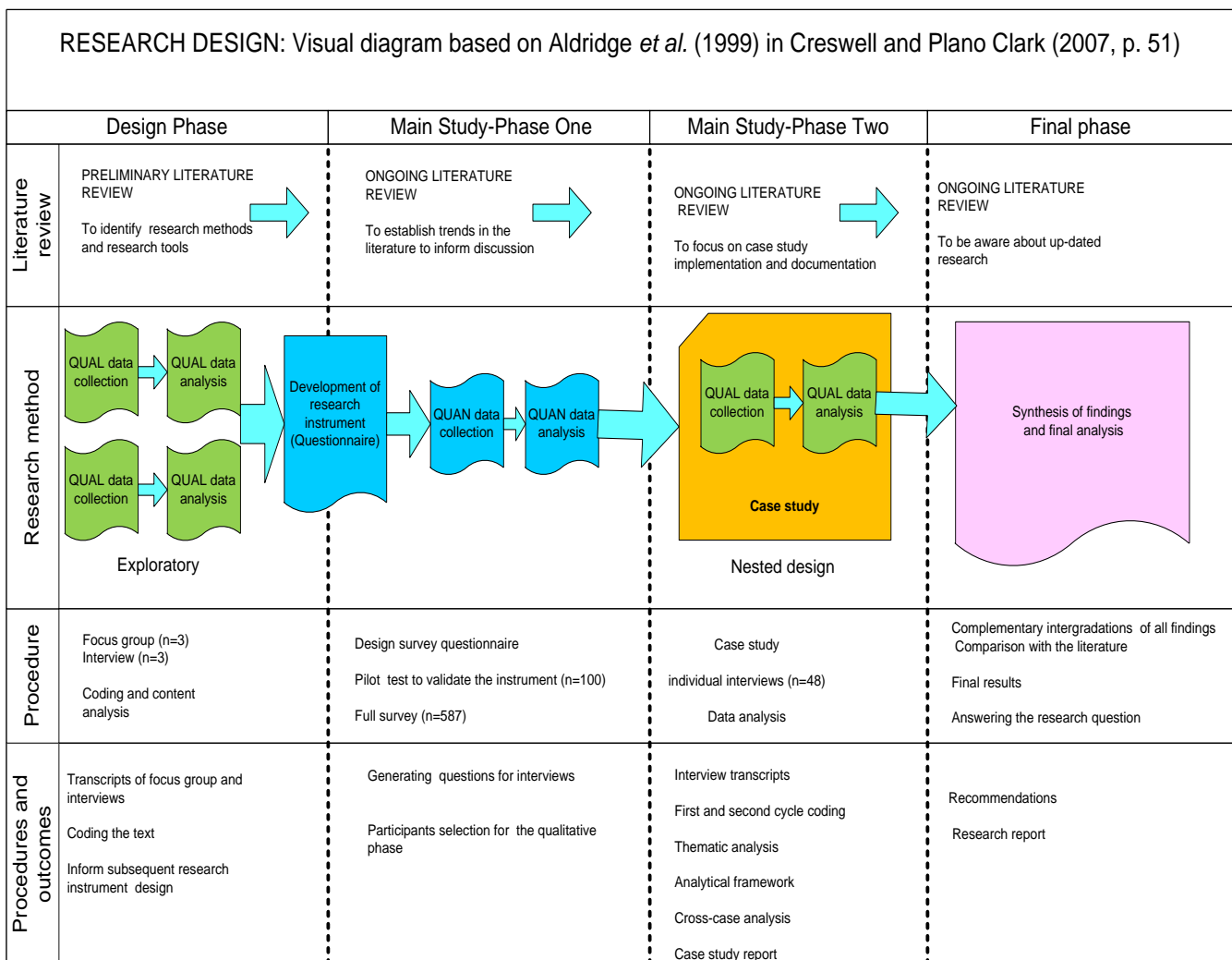
### 3.5 Research design

A research design sets up a framework for the collection and analysis of the data (Bryman, 2008). The most appropriate mixed methods design for this study is the sequential explanatory design. In this design, quantitative data is collected and analysed in the first phase, followed by the collection and analysis of qualitative data in the second phase based on the results of phase one (Creswell, 2014). In this study, the quantitative, numeric data were collected using a self-administered questionnaire. In this research, mixing of the methods took place when designing the survey questionnaire. Mixing of the methods is valuable ‘as a means of developing research instruments, e.g. researchers who are designing a questionnaire for use in a survey can employ qualitative data through focus groups and interviews to improve the validity of a subsequent survey questionnaire that produces quantitative data’ (Denscombe, 2007, p.110). Mixing also occurred in several stages during the research process for qualitative analyses to support the quantitative one, which was designed to answer the research question. In this study, the quantitative phase provides a general picture of the situation regarding KU libraries’ resources and services, while the qualitative phase helps to refine and explain the quantitative, statistical results by exploring the participants’ views in more depth to obtain a fuller picture.

When designing a mixed methods strategy, three things need to be considered: priority, implementation and integration (Creswell *et al*, 2003). Priority is related to which method is given more weight in the study, either quantitative or qualitative. In this design, the priority is given to the qualitative method because qualitative research represents the main aspect of the data collection process and analysis in the study. Implementation is related to whether the quantitative and qualitative data collection and analysis will be conducted in sequence with one following the other (sequential), at the same time (concurrently) or in parallel (convergent parallel). In this study, the purpose of having the quantitative phase first is to identify the power of the selected variables in detecting the perceptions of the graduate students regarding support for their research provided by the university libraries. In addition, it makes it possible to select the interviewees for the second phase. Integration relates to the phase in which the mixing of quantitative and qualitative data occurs in the research process.

Integration takes place at one stage (final phase) of the research process within the single case study, as illustrated in Figure 3.1. The results of the two phases are integrated during the discussion of the ability of the study outcomes to help answer the research question. The purpose of mixing both the quantitative and qualitative approaches is to capture the trends and

details of the situation and to fully understand the research problem, which in this case is the complex issue of how KU libraries support graduate students' research. The use of both approaches strengthens a study more than would be possible by using either qualitative or quantitative research alone (Creswell and Plano Clark, 2007). It is common, of course, for a researcher to use several research methods, as this makes it possible to verify and validate the information being gathered and helps prevent significant errors from occurring that might affect the process of data analysis (Blaxter *et al*, 2006). Therefore, the best design that fits the purpose of this study is the sequential explanatory mixed methods approach. Figure 3.1 shows the procedures of data collection and analysis throughout a research project.



**Figure 3-1 Visual representation of the sequential explanatory mixed method strategy**

A detailed explanation of the research process is provided in Section 3.5.1, Section 3.5.2 and Section 3.5.3.

### 3.5.1 Design phase (questionnaire development process)

Interviews and a focus group were conducted to enable the researcher to capture the graduate students' perspectives regarding the role of academic libraries in supporting their research and to gain an understanding of the research problem. Semi-structured interviews were conducted with three graduate students from the University of Sheffield, and a focus group was conducted with three graduate students from KU to address the following specific objectives:

- To explore how graduate students use library resources and services to support their research.
- To examine to what extent graduate students think that the provided materials are valuable for their research.
- To investigate to what extent graduate students are satisfied with the library resources and services offered to support their research.
- To inform the research design and prepare the questionnaire for the pilot study.

An interview schedule was drawn up, and open-ended questions were used to elicit the opinions, insights and attitudes of the participants (see Appendix 7-A for a copy of the schedule). The interview questions were tested by conducting preliminary interviews with two graduate students at the University of Sheffield. Based on feedback, the interview schedule was revised after the testing of the questions. The formal interviews were then conducted in April 2009 with three respondents from the LIS department who agreed to participate in the research project. All were international students; two were from the University of Sheffield and the other was from KU. The first two interviewees participated in face-to-face interviews and the third participated in an e-mail interview. Although English is the second language of the interviewees, the interviews were conducted in English, as the participants are fluent in English. The interviewees remained anonymous.

A focus group was conducted in May 2009 with three graduate students from KU (see Appendix 7-B for a copy of the schedule). The focus group session was conducted in the first language of the participants (Arabic) to gain in-depth insight into the respondents' perceptions and attitudes relevant to the research. As Morgan (2006) emphasised, the members of a focus group share their opinions and experiences in relation to what others have said. This sharing is particularly useful for hearing and understanding a wide range of responses to a research project. The purpose and scope of the project was explained on an information sheet (see Appendix 6-A), and consent was obtained to record the discussion (Appendix 6-B). The focus

group was held at Jaber Al-Ahmed Central Library. The confidentiality and anonymity of the respondents was assured before the session began. The discussion was recorded and took about 53 minutes to complete. The discussion was transcribed to elicit the main responses relevant to the research project. Using a focus group proved extremely useful in assisting the researcher to identify the main issues emerging that were relevant to the study.

The data gathered from the interviews and focus groups were analysed manually due to the small number of participants. After recording the interviews, the researcher listened carefully to each one, looking for significant statements, and then transcribed them accordingly. The data were initially categorised (content analysis) into codes or concepts. Afterwards, the researcher analysed all the data presented in each interview, together with any suggestions or comments made by the interviewees.

The findings of the interviews revealed that graduate students use the library in the way that can support their research, but they tend not to seek the librarians' assistance when trying to satisfy their information needs. However, the focus group results suggested that taught graduate students at KU are unaware of the services offered by the library to support their research and that qualified library staff are urgently required. These findings helped the researcher to identify issues related to the use of the library by graduate students, such as the lack of marketing the services and a lack of communication between the graduate students and the librarians. Denscombe (2007, p.110) notes that 'the qualitative data collected through interviews and focus groups can be valuable initially as a way of shaping the kinds of questions and...to ensure that the questions have been worded suitably'. After examining the responses, a draft questionnaire was prepared. The results from the interviews and focus group informed the questionnaire design.

To ensure the validity of the data collection technique, Information School faculty members at the University of Sheffield reviewed the draft questionnaire, after which it was revised accordingly. The questionnaire is straightforward and was designed to progress in a logical order, avoiding misleading or ambiguous questions. When the questionnaire was ready, it was converted into print format. It was designed to take no more than 15 minutes to complete (see Appendix 2-A).

Next, the questionnaire was translated into Arabic. To ensure the accuracy of the translation, the researcher emailed both the Arabic and English versions of the questionnaire to two faculty

members of the Library and Information Science Department at KU who are fluent in both Arabic and English to check and approve the translation.

### ***What was learnt from the design phase?***

The researcher learnt that qualitative data collection can be employed in the design phase:

- At the exploratory stage of the project, when the research problem is not well defined, the data collected through the focus group and the interviews provided the researcher with new ideas and direction.
- Learning about the subject by engaging with the participants enabled the researcher to understand the area of study in a preliminary way and helped in refining the research problem.
- The interviews and the focus group provided the researcher with insights regarding the research topic.
- By restricting the range of topics considered by the focus group, it was possible to investigate scientific topics in detail.
- The interviews allowed the researcher to go more deeply into issues of interest and to explore the problem at hand.
- The design phase helped to improve the quality of the questionnaire and strengthen its design. Understanding the target respondents' attitudes, opinions and behaviours associated with the subject of the research survey helped in developing the questionnaire.

This phase informed the subsequent research instrument design by identifying the study dimensions that needed to be tested, helping to shape the relevant questions and generating options for the survey questions. The findings from the design phase suggested that graduate students studying at KU are not aware of the library support available to them, which is in contrast to the University of Sheffield graduate students' perceptions.

### **3.5.2 Main study - phase one (questionnaire)**

For the purpose of this research, the developed questionnaire was first pre-tested on a small sample to ensure its validity and was then distributed to the targeted sample to collect the quantitative data. A detailed description of each process is provided in the following sub-sections.



### **3.5.2.1 Pre-testing questionnaire**

Before distributing the questionnaire, a pilot study was conducted in which the questionnaire was pre-tested on a sample of 100 graduate students who were selected randomly from the colleges of KU to check whether the Arabic words were understandable to the respondents, and to seek comments on the suitability of the content. The purpose of conducting a pilot study is to eliminate any bugs from the instrument by carrying out a preliminary analysis in order to avoid any difficulties that may arise during the data analysis (Bell, 2005). The questionnaire for this study was piloted with graduate students from KU in May 2009. After examining the responses from the pre-testing, the questionnaire was modified. It was divided further into five sections, with the fifth section being about familiarity with the library services. It was decided to include the four KU colleges that have their own specialised libraries managed by one senior librarian. Therefore, regarding the demographic information on the questionnaire, the question about the colleges was limited to the College of Engineering, the College of Science, the College of Arts and the College of Law. Another question was added that asked about the frequency of library visits. Based on the input received during the pre-test, the final version of the questionnaire was developed (see Appendix 2-B).

### **3.5.2.2 Distribution of the questionnaire**

In April 2010, permission was received from the Dean of Students Affairs of the CGS allowing the researcher to conduct the survey (see Appendix 3). The Dean's letter was distributed to all graduate programmes in the four selected colleges. Next, a copy of the full schedule of the courses, with a list of the classes in each department, the number of students enrolled and the name of the faculty members teaching the courses was provided. To ensure a high response rate, a self-administered questionnaire was distributed to the graduate students during their lectures. The researcher distributed the questionnaire personally with the help of the coordinators of each department of the targeted colleges. Questionnaires can be managed in many ways: self-administration, by post, face-to-face interview, telephone, email, group administered, or household drop off survey (Cohen *et al*, 2007; Gay and Airasian, 2003; Wilkinson and Birmingham, 2003). In addition, permission was granted for the researcher to attend the last 15 minutes of certain midterm exams to distribute the questionnaire to the graduate students and ask them to complete it there and then after they had finished the exam. The advantage of personally distributing the questionnaire is that it allows more room to explain the objectives of the research and its value and to answer any questions the graduate

students might have about the survey questions. On average, the students spent 10–15 minutes answering the questionnaire.

### **3.5.3 Main study - phase two (case study)**

A case study is defined as a research strategy that focuses on understanding the dynamics present within a single setting (Eisenhardt, 1989). This approach has been used widely in LIS research (Eisenhardt, 1989; Yin, 2009; Stake, 2005; Thomas, 2012) and involves mixing data sources within single settings, such as interviews and questionnaires. Its evidence can be in a form of numbers (quantitative), words (qualitative) or both (Eisenhardt, 1989). This approach allows the researcher to use multiple research methods and different sources and types of data, depending on the specific needs of the situation (Denscombe, 2007) and thus allows the researcher the opportunity to provide a rich description of the context of KU libraries and the support they provide to help graduate students with their research.

#### **3.5.3.1 Type of case study design**

There are number of case study designs. These have been evaluated, and the most appropriate case study design for this study is discussed in the following sub-sections.

##### **3.5.3.1.1 Single or multiple**

Case study designs can be single or multiple. The disadvantage of single cases is the generalisability limitations and the several potential information-processing biases (Eisenhardt, 1989). Due to the limitations of the single case study, it is desirable to include more than one case as the embedded unit of analysis. Yin (2009) defines four types of case study, single holistic; multiple holistic; single embedded and multiple embedded. In holistic case studies, the researcher examines the total nature of a studied case, while the embedded case study design involves one or more units of analysis. In a multiple case study design, the researcher focuses on all the selected cases. Yin (2009) recommends that a single case study include sub-units of analysis (embedded) and that the researcher focuses on the units. Therefore, this study should be considered a single embedded case study because it focuses on a single context (Kuwait University libraries) and investigates the use of specialised libraries (engineering, science, law, arts) as embedded cases (embedded units). The research stage is the sub-unit of analysis, which allows the researcher to extensively analyse the studied situation. In this study, the role of the library (library use) is the single case study phenomenon. The cases, electrical engineering

(EED), microbiology (MCD), Islamic history (IHD) and public law (PLD), in this setting will be of secondary interest and are used to facilitate our understanding of something else (e.g. the disciplinary differences related to library use) rather than studying the case itself. Figure 3.2 illustrates the single embedded case study design employed in this study.

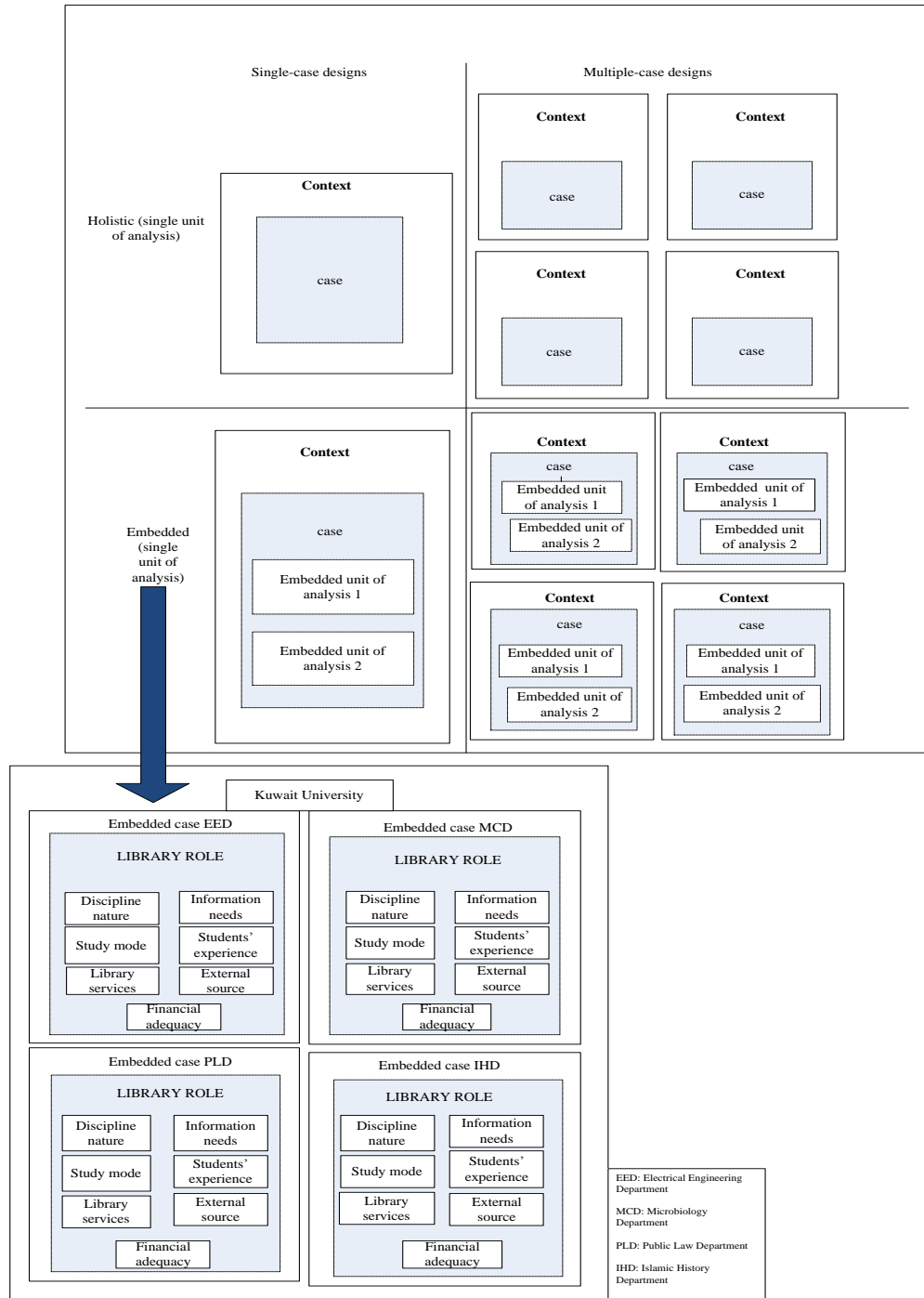


Figure 3-2 The single embedded case study design employed in this study

### 3.5.3.1.2 Case study types

Different scholars offer different case study topologies. Yin (2009) identified three types of case studies—explanatory, exploratory and descriptive. For researchers who focus on causality and aim to provide detailed explanations, Yin (2009) suggests using an explanatory case study. When the researcher is challenged by a shortage of related literature about the examined topic, the case study would be exploratory. If the researcher is interested in describing a specific phenomenon in a very detailed context, this would be defined as a descriptive case study. According to Yin's topology, this study would be classed as exploratory.

Stake (2005) defines case studies differently than Yin (2009), categorising them as intrinsic, instrumental and collective. According to Stake, if a researcher is interested in a unique situation, the case study would be intrinsic. If a researcher aims to gain insights and a better understanding of a particular phenomenon, the case study would be instrumental. The term 'collective case study' is used by Stake when more than one case is being examined. Based on Stake's topology, this study would be classed as instrumental.

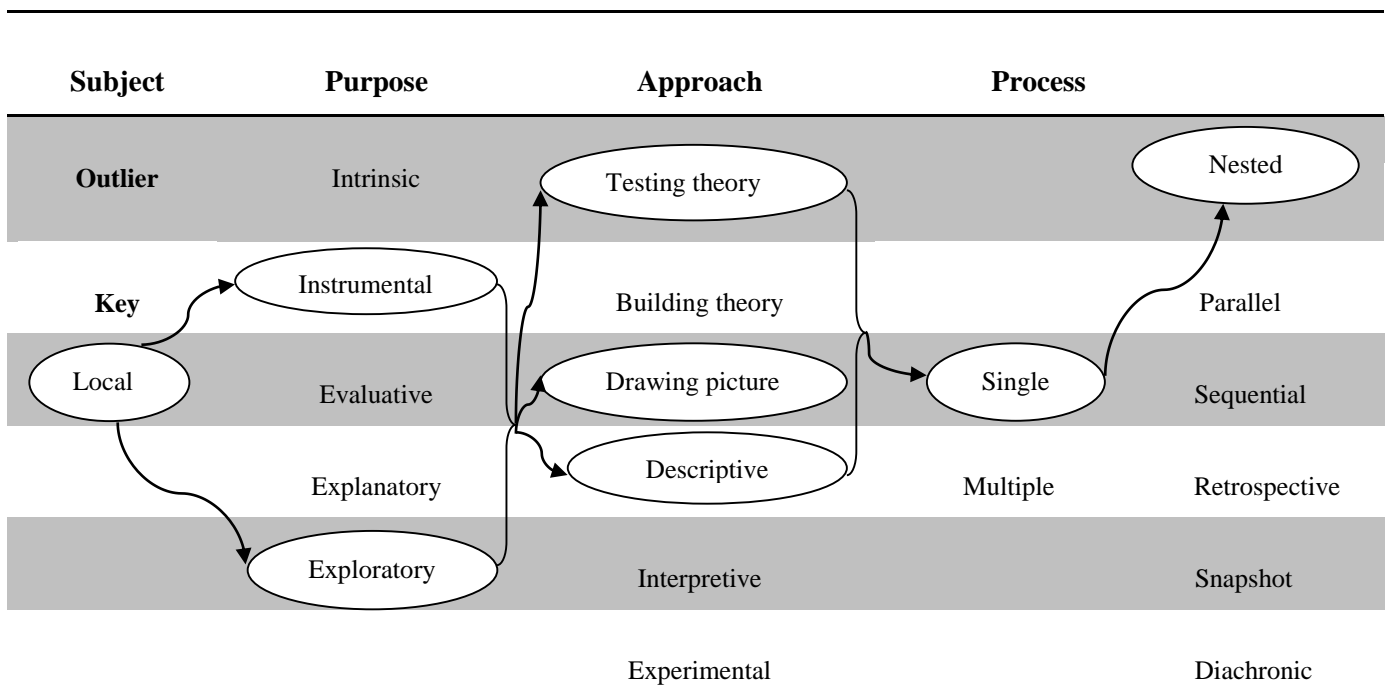
Thomas (2012) added new categories to identify case studies. He suggests that the researcher should decide how the study should proceed, such as explaining, evaluating or exploring, and what approach will be undertaken, whether it is describing, interpreting or trying to build or test theory. Thomas's (2012) approach to case study design is comprehensive in contextualising and framing the type of case study, more so than those of Stake (2005) and Yin (2009). The researcher is familiar with KU libraries from her own experience of being a Master's student. Thomas (2012, p.77) defines this type of case study as a 'local knowledge case', that is, '... an example of something in your personal experience...' rather than a 'key case', that is, a good example of something, a classic or exemplary case or an outlier that shows something different from the norm.

The researcher has a particular purpose in studying KU libraries, which is to gain a deeper understanding of its role in supporting graduate students' research. Thomas (2012, p.98) defines this type of case study as instrumental rather than intrinsic. The case is also exploratory, as there is little previous research on this topic in the specific context of Kuwait. As the researcher is attempting to gain a better understanding of KU's situation by studying small working units—the EED, MCD, PLD and IHD departments—this would suggest the drawing picture approach (illustrative) which makes the major differences between these working units understandable (Table 3.2). The researcher uses a conceptual framework based on the dimensions of Whitley's theory (discussed in Chapter 2, Section 2.6.2.1) to explore the cultural

difference between the studied cases, and the graduate students' information use and behaviour at KU. The case study was undertaken to test the applicability of this theory in a library context rather than to build theory.

Yin (2009) draws a useful distinction between single embedded case studies and multiple case studies, while Thomas (2012) refers to the embedded case study as 'nested'. Following, Thomas' classification of case study design, Table 3.2 illustrates the pathway for this research.

**Table 3-2 Design of nested case study, based on Thomas (2012)**



An explanation for why the case study approach was selected to be the possible research design for this study is provided in the following section.

### 3.5.3.1.3 Justification for selecting case study approach

To ensure the most suitable approach is adopted for analysing the qualitative data, the researcher must choose the approach that helps most with collecting and analysing the data to produce a complete and successful research project. Creswell (2007) identifies five research approaches that can be used within a qualitative inquiry: phenomenology, narrative research, ethnography, grounded theory and case study. These approaches are similar with regard to data

collection methods, although there are differences, particularly in terms of the data analysis process.

Phenomenology studies the lived experiences of persons (Creswell, 2007). The participants need to be chosen carefully according to their experience, and the focus is on their common experience (Creswell, 2007). In the current study, the researcher is concerned with examining disciplinary differences in relation to information use and information behaviour based on various experiences and not a common experience; therefore, this approach would not best fit the aims and objectives of the study. Similar to phenomenology, phenomenography is an approach that focuses on the various ways in which people experience things (Walker, 1998), with the focus on the collective meaning (Marton, 1986) rather than on studying the given phenomenon. The researcher aims to investigate the information use phenomenon based on the students' experience and not to describe differences in understanding the phenomenon. Therefore, this approach is unsuitable for achieving the overall aims of the study.

Narrative research focuses on studying one or two individuals and telling the story of an individual's single life experiences, described chronologically within their personal, social and historical context (Clandinin and Connolly, 2000). In this study, the researcher is interested in exploring the research phenomenon based on the students' own experiences within one context (Kuwait University) and not in reporting the life experience of a single individual. Therefore, this approach is unsuitable for meeting the aims and objectives of this study.

According to the nature of this research, ethnography, grounded theory and case study would be possible approaches to help answer the research questions in this study. The researcher's interest in disciplinary cultures makes ethnography a potentially useful approach, as this technique focuses on individual experience as it occurs within the context and involves many people interacting over time as a culture-sharing group. It is based on observation of the participants, during which the researcher should become immersed in the day-to-day lives of people (Creswell, 2007). However, the limited time available for the research meant that the researcher could not fully immerse herself. Ideally, she would have to observe people in the library, as well as interview them about their information use and information behaviour.

The present theory (difference between the studied disciplines in using the library) resulting from quantitative data does not address variables of interest that are valuable to the researcher, and nor does it explain how the graduate students experienced the research phenomenon. Therefore, there is a pressing need to complete the theory based on the participants' experiences

(Strauss and Corbin, 1998). In this case, grounded theory would be a suitable approach for illuminating the studied phenomenon. It takes considerable time to collect the data from the field and analyse all of it. The significant amount of time required for this is not possible for this research. This is perhaps the main reason for not adopting grounded theory.

Both ethnography and grounded theory are time-consuming. This is the main reason for not adopting grounded theory or ethnography for this research project, as they would not provide a pragmatic solution to the research problem.

The researcher has a particular purpose in studying KU libraries, which is to gain a deeper understanding of their role in supporting graduate students' research; the specific question to be answered is 'How do KU libraries support graduate students' research?' The type of research question is the most significant issue in determining the most appropriate approach for this study. The case study approach can be very useful in providing answers to 'how' questions and for conducting exploratory research (Thomas, 2012). 'Case study is a good approach when the inquirer has clearly identifiable cases with boundaries and seeks to provide an in-depth understanding of the case or a comparison of several cases' (Creswell, 2007, p.74). In this study, the researcher employs four cases with boundaries (EED, MCD, IHD and PLD), and exploring the information use and information behaviour in those cases is the main aim of the researcher in order to investigate the support role of the library. Using the case study approach within a 'nested' (or embedded) design enabled the researcher to analyse the studied situation deeply within a single context (Kuwait University). The strength of the case study is that it allows researchers to investigate a phenomenon in its context (Thomas, 2012). The 'nested' studies ask questions only about the unit of analysis and any sub-units, and the evidence gathered is determined by the boundaries that define the nested units. This research studied small working units of analysis (EED, MCD, PLD and IHD) as nested units and sub-units (research stages) that enable the researcher to seek evidence within the limits of different units of analysis. In addition, the case study strategy enables the researcher to adopt a comparative approach across a number of cases in a systematic way, which can be very helpful when exploring different research issues related to information use and behaviour (Thomas, 2012). Importantly, the case study often takes less time than ethnography and grounded theory, offering a pragmatic research approach.

### **3.6 Choice of unit of analysis**

Defining the unit of analysis is a major step when conducting a single case study. A unit of analysis can be an individual, a small group, a set of policies or a whole organisation (Creswell,

2007). As the rationale for this study is to explore the disciplinary differences regarding the use of the library for research and which factors influence the role of the library, the researcher had to decide what the main unit of analysis was to be—groups, individuals or an organisation. A decision was made by the researcher to focus on individuals (graduate students) because it was believed that this was the most suitable unit for understanding the phenomenon under investigation (library use). Individuals in the case being studied can be a primary unit of analysis for data collection (Yin, 2009). Therefore, the researcher collected data from graduate students (Master's students) at KU to understand how KU libraries support them in their research. The researcher in this case study, attempts to access the phenomena via individuals to understand the disciplinary differences regarding library use rather than studying the subject itself.

### **3.7 Study population**

For the purpose of this study, it was decided to select graduate students studying at KU in the Colleges of Engineering, Science, Arts and Law, whilst students at the Colleges of Education, Health Sciences, Islamic Studies, Business Administration and Social Sciences were excluded. This is because these colleges do not have specialised libraries serving only one discipline, and one of these college libraries (Health Science) is not administered by KULA. In the first phase of this research project, the study population was restricted to all graduate students studying at the four colleges. In the second phase of the study, the participants were selected purposely from different departments in the same colleges, namely the Electrical Engineering Department (EED), the Microbiology Department (MCD), the Islamic History Department (IHD) and the Public Law Department (PLD). As the study deals with graduate students, the research focuses on the services that are offered by KU libraries to graduate students. Furthermore, the findings of this study cannot be generalised to a wider population in the university unless they have similar characteristics.

The following sections (3.7.1, 3.7.2, 3.7.3 and 3.7.4) provide a brief account of the KU graduate programmes that are the focus of this research project—engineering (electrical engineering), science (microbiology), arts (Islamic history) and law (public law).

#### **3.7.1 The Engineering Master's Programme**

The Electrical Engineering Department at KU (College of Engineering and Petroleum) offers a Master's degree of science in electrical engineering. The research requirements of this programme are either to write a thesis or undertake a project in addition to producing a report



(thesis option vs. non-thesis option). The main language of instruction in the electrical engineering programme is English. The programme is designed to demonstrate the individual's capabilities in the production of work that fulfils the criteria expected by professional and academic standards. Both part-time and full-time students are enrolled in this programme. In order to pass the programme, students must complete at least 33 credits and submit a report for the non-thesis option, whilst the students who choose the thesis option must complete 24 credits in addition to the thesis (CGS, 2013 b).

### **3.7.2 The Microbiology Master's Programme**

The Department of Biological Science (College of Science) offers a Master's degree of science in microbiology. This programme offers only a thesis option. The main language of instruction in this programme is English. Only full-time students are admitted to this programme. It is designed to prepare graduates for further academic study or career development. In order to meet the programme requirements, students must complete at least 31 credits, including a three-credit course run by the Faculty of Medical Science, in addition to a thesis (CGS, 2013 b).

### **3.7.3 The Public Law Master's Programme**

The College of Law offers a Master's degree in public law. Arabic is the main language of instruction. Both full-time and part-time students are admitted to this programme. A thesis is the only option offered by the public law programme to meet the requirements. The programme is designed to equip graduates with a high academic level of legal specialisation. In order to pass the programme, students must obtain 30 credits at least and submit a thesis (CGS, 2013 b).

### **3.7.4 The History Master's Programme**

The College of Arts offers a Master's degree in Islamic history. The main language of instruction is Arabic. Both full-time and part-time students are admitted to this programme. A thesis is the only option to fulfil the requirements. The programme is designed to acquaint graduates with historical sources and to train them to develop their analytical faculties and to make adequate use of their skills for the purpose of research. In order to pass the programme, students must complete 36 credits, including a thesis (CGS, 2013 b).

## 3.8 Rationale for selecting the case of Kuwait University Libraries

The decision to focus on KU was made for the following reasons:

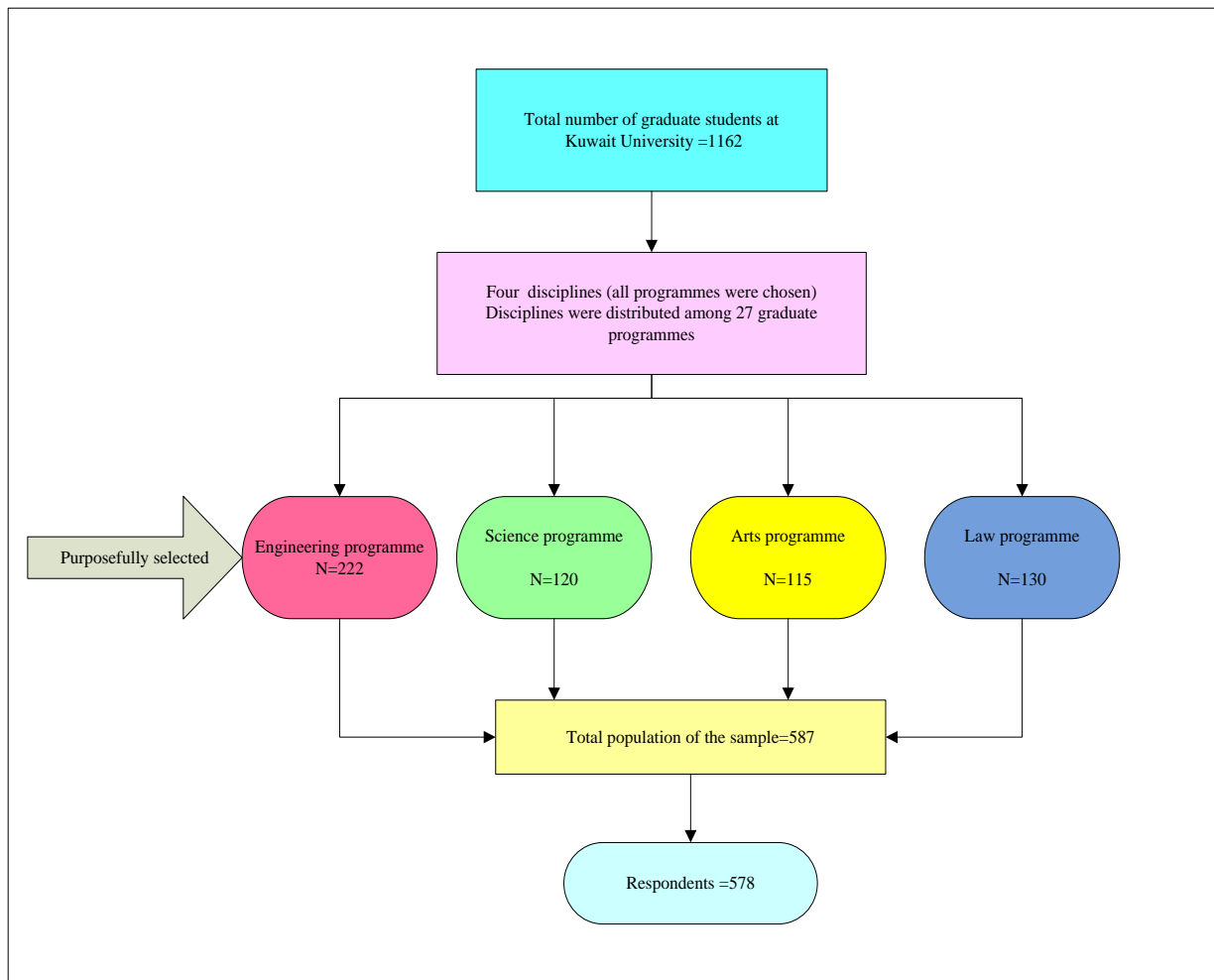
1. KU is the oldest university (established in 1966) and the largest university in terms of its landscape coverage. It is the only public university in the state of Kuwait, although there are a number of private universities.
2. The university covers a wide range of academic fields in which research and teaching is carried out and can support the aims and objectives of such research.
3. The university represents a wide range of graduate programmes, including different Master's degree programmes and academic departments.
4. The researcher has a personal interest in understanding the role of KU libraries in supporting graduate students' research as she was a Master's student there.

## 3.9 Sampling

A sample is a 'subset of the population, usually with the implication that the subset resembles the population closely on key characteristics (is representative of the population). If the sample is representative of the population, then what is true of the sample will also be true of the population' (Sapsford, 2007, p.7). For the purpose of this study, purposive sampling techniques were used. Tashakkori and Teddlie (2003, p.713) have stated that 'purposive sampling techniques involve selecting certain units or cases based on a specific purpose rather than randomly'. These techniques are designed to make it possible to select a small number of cases that can reveal more detailed information about the particular phenomenon under investigation (Patton, 2002).

### 3.9.1 Phase I: quantitative sampling

For this study, four libraries were selected. Based on statistics from KU's College of Graduate Studies for 2009–2010, the total population of graduate students (N=587) enrolled at the four selected colleges was surveyed. The questionnaires were distributed to those graduate students, and 578 valid responses were obtained (a response rate of 98%). Figure 3.3 illustrates the purposive sample drawn from the total population of graduate students at KU.



**Figure 3-3 Purposive sample of graduate students drawn from total population of Kuwait University**

### 3.9.2 Phase II: qualitative sampling

For the second phase of the study, four specialist fields were selected randomly from the four disciplines (Arts, Sciences, Law and Engineering). These specialised fields are Islamic history, electrical engineering, public law and microbiology. Hjørland and Albrechtsen (1995) state that the most general implication of domain analysis is that it is more productive to take domains, be they specialisms, disciplines or broad disciplinary groupings, as the basic unit of analysis. Fry (2003) states that within a single discipline, specialisms vary in terms of their knowledge creation and work organisation, which makes a comparison of information use and behaviour based on broad disciplinary groupings, such as natural sciences and humanities, challenging in developing a theoretical model. Fry (2004) also states that an explanatory framework based on broad disciplinary groupings as the units of analysis does not support the understanding of information use and information behaviour during the research process. The

discipline reflects a pedagogical and administrative role, while the specialised field represents the research activities (Lenoir, 1977). Furthermore, Chubin (1976) argues that the specialist fields are reasonable cultural entities that can represent the research process more effectively than the conventional use of disciplines as a basic unit of analysis. Based on the literature presented, the researcher decided to study information use and information behaviour within a specialist field as a unit of analysis rather than within broad disciplinary groupings, such as engineering, arts, science and law.

In this phase, a sub-set of 48 graduate students was selected purposefully from the four specialised fields (Islamic history, electrical engineering, public law and microbiology) based on a desire to gain a deeper understanding of the phenomenon. This target population was divided into strata (homogenous sub-groups within a population) based on the stages of their research (e.g. first stage, mid stage and final stage). The aim was to discover the elements of the information needs, information use and information behaviour across the different sub-groups (Tashakkori and Teddlie, 2003). Next, participants were selected randomly from each sub-group. This strategy is called ‘stratified purposeful sampling’ and was chosen by the researcher based on her study purpose, question and objectives (Onwuegbuzie and Leech, 2007).

All the specialised fields that were selected randomly from the four faculties offer only Master’s degree programmes. It should be noted that electrical engineering graduate students can complete the course requirements within two years by submitting a research project or dissertation, while in other selected fields it is possible to complete the course requirements within four years after submitting a dissertation (KU’s College of Graduate Studies, 2012). Table 3.3 shows how the stratified purposeful sampling strategy was implemented with the target population of the study.

**Table 3-3 Purposive sampling design by level of study\***

<b>Specialised fields</b>					
<b>Research stages</b>	EED	MCD	IHD	PLD	<b>Total</b>
First stage (proposal development )	n=4	n=4	n=4	n=4	n=16
Mid stage (writing up and data analysis)	n=4	n=4	n=4	n=4	n=16
Final stage (reflection on experience)	n=4	n=4	n=4	n=4	n=16
<b>Total</b>	n=12	n=12	n=12	n=12	n=48

\*This is called a 3 × 4 sub-group sampling design

It should be noted that selecting the sample of 48 students from the four academic fields and dividing the selected target population into strata (stratified sample) based on the stages of their research (e.g. first stage, mid stage and final stage) was challenging. The iterative nature of the research in some of the selected disciplines (e.g. Islamic history and public law) where the writing-up stage proceeds in parallel with the data analysis made it difficult for the researcher to identify what stage the participants were at. In this case, the researcher merged the writing up and data analysis into one stage called the mid stage for all the studied disciplines, which may have affected the study findings. This is discussed in Chapter 11, Section 11.5.2 (Sampling Limitations).

### **3.10 Data collection methods**

In addition to the focus group that was used in the design phase, two basic data collection methods were used in this study—survey questionnaires and research interviews. The reason for selecting these two basic methods is discussed below.

#### **3.10.1 Questionnaires**

Referring to the literature review, the first research tool used in the sequential mixed methods strategy is the questionnaire. It was selected because it allows the collection of information from a large population of graduate students spread over a wide range of disciplines and courses (Busha and Harter, 1980). Therefore, it was used as a quantitative method to obtain information about KU libraries' resources and services. For the purpose of this research, printed questionnaires were the most appropriate data collection technique because of the lack of online access to the list of graduate students through the CGS, which would have reduced the response rate.

### 3.10.2 The research interviews

To meet the aims and objectives of this research, in-depth semi-structured interviews were conducted to collect qualitative data for the study. Interviews are known to be useful when the researcher intends to access people's experiences, inner perceptions, attitudes and feelings about the reality of a specific topic under investigation (Fontana and Frey, 2005). Therefore, in-depth interview data enabled the researcher to access the experiences of the participants (the graduate students and librarians) within a particular cultural context (KU) (Zhang and Wildemuth, 2009).

Importantly, most of the data collected via the questionnaire (see Chapter 4) suggest there are significant differences between the respondents from the four faculties (arts, law, science and engineering) in terms of their perceptions of the role of the library in supporting their research. However, the quantitative results do not provide the researcher with a fundamental understanding of the differences between the disciplines in using information for research. Therefore, for this research, face-to-face interviews were conducted to strengthen and 'deepen' the data obtained from the questionnaires. Therefore, in-depth interviews are necessary to provide a deeper understanding of the disciplinary differences involved in library use (George *et al.* 2006).

#### 3.10.2.1 Advantages and disadvantages of interviews

Interviews as a data collecting technique have many advantages, as identified by qualitative researchers. According to Marshal and Rossman (2010), some of the advantages are as follows:

- Flexibility to explain the interview questions and adaptability to find out about the topic investigated.
- Facilitates interaction with the participants and allows for effective consultation.

Despite the richness of the data that can be obtained by using interviews, they have limitations, as follows:

- Interviews should be carried out by a researcher who has been properly trained (Fink, 2003) and who has the ability to code the data, which is time-consuming and requires detailed analysis (Bernard, 2000, p.19).
- Interviews are known to have high subjective bias (Bell, 2005).

### **3.10.2.2 The interview process**

The literature suggests that collecting qualitative data via semi-structured interviews can be done in several stages. Cassell and Symon (2011) state that the process of constructing and using semi-structured interviews can be divided into four steps:

1. Preparing the interview: choosing an interview type, according to the aim and objectives of the research.
2. Creating the interview guide: listing and suggesting probing questions to elicit further details from the participants.
3. Recruiting the participants: ensuring that the sample represents the total population to increase the number of different viewpoints.
4. Carrying out the interview: contacting the participants, setting up an interview appointment and confirming the venue. Open the interview by greeting the participant. Following this, assure confidentiality, obtain permission to record the interview and ask open questions and appropriate follow-up questions. Close the interview with concluding remarks and thanks.

The researcher followed these steps as a useful guide and prepared a semi-structured interview, including open-ended questions, to explore the experience of the participants regarding using the library and to obtain their reflections on the role of KU libraries in supporting their research. The interview questions were based on the quantitative findings from the first phase of the study. The semi-structured interviews were based on the use of an interview guide (see Appendix 7-C).

### **3.10.2.3 The pilot study**

In order to test the techniques and make any necessary modifications to the interview questions, a pilot study was conducted in April 2012. The researcher sought a list of graduate students enrolled in each selected department from the targeted colleges, together with their telephone numbers, so that she might contact them. In order to access the list of graduate students, a permission letter was issued by the Dean of the CGS. The study involved a pilot group comprised of eight students selected randomly from the total sample population of 48: two electrical engineering students (first year, second year), two microbiology students (first year, final year), two public law students (second year, third year) and two Islamic history students

(third year, final year). The researcher attempted to incorporate two students from each year and two students from each specialised field to create a reasonable mix across the four disciplines. The interviews were digitally recorded and the interview transcripts analysed. Upon further analysis of the pilot interviews, new themes were highlighted, such as:

- Language difficulty
- Awareness
- Personal networking
- Modes of information use

The data collected via the pilot study were rich enough to provide the researcher with fundamental information about the differences between the disciplines with regard to information use and information behaviour. Therefore, the researcher decided to consider the data collected in the pilot study as part of the main study findings.

The pilot interviews were useful in many ways. They enabled the researcher to gain confidence and familiarity with the in-depth interview questions. In addition, the pilot interviews were good practice for the researcher in constructing qualitative descriptions and conceptualising the data. It should be noted that the content and wording of the interview questions have not been changed.

#### **3.10.2.4 The actual interviews**

The actual interviews were conducted with the remaining 40 graduate students from the stratified sample in November, 2012. The researcher rang the interviewees personally to invite them to attend a face-to-face interview. Due to Kuwaiti cultural practices, some of the interviewees did not wish to be interviewed face-to-face, particularly females. Although the researcher had an initial awareness of cultural issues in Kuwait, she only encountered the reality of these when she became more deeply involved with the participants. Therefore, the researcher removed those who refused to be interviewed from the sample and replaced them with other randomly selected students from the list. The researcher continued to ring each participant to invite them to an interview and overlooked those who did not wish to attend. Once a participant agreed to be interviewed, the researcher set up an appointment and venue with him/her. The interviewees were asked to reflect on their experience and opinions regarding their use of library resources and services during the course of their research. Many questions emerged while interviewing the participants, and therefore the collected data were rich and sufficient for obtaining a full picture of the real situation of KU libraries regarding their role in supporting



graduate students' research. All the information was recorded, with the interviewees' permission. Conducting the interviews was a learning process that enabled a responsive interview protocol to be developed. This allowed the researcher to ask additional probing questions to explore particular themes introduced in the initial interviews (see Appendix 8).

### **3.11 Data analysis procedure**

The analysis of the collected data was conducted in different stages. In the first phase, quantitative data were coded and entered into the Statistical Package for the Social Sciences (SPSS). Before conducting the actual analysis, the data were screened and cleaned to check for errors where the values fell outside the range of possible values for the variables. In the second phase, the qualitative data were recorded, transcribed, translated into English and analysed using NVivo 9.0 and 10.0, qualitative data analysis software. The data analysis will be discussed in the following two sections (3.11.1 and 3.11.2).

#### **3.11.1 Phase I: quantitative analysis**

The questionnaire data were analysed using two main types of statistics, descriptive statistics and inferential statistics.

##### **3.11.1.1 Descriptive statistics**

Descriptive analysis is a technique used to analyse the characteristics of and relationships among different variables based on systematic observation (Williams and Monge, 2001). In this study, this technique was used to obtain the frequencies and percentages for the demographic and academic background variables and the group of variables included in each dimension of the questionnaire, such as library provision, the types of material used, user satisfaction, service familiarity and perceived library role.

##### **3.11.1.2 Inferential statistics**

Inferential analysis was used to determine whether the observed differences between the independent variables (IVs) and the dependent variables (DVs) were statistically significant by using the Chi-square test of independence, the Mann–Whitney U test and the Kruskal–Wallis test. A Spearman's correlation test was also used to determine the strength of the relationship between the DVs and the IVs. Table 3.4 summarises the statistical (non-parametric) test used to analyse the quantitative data.

**Table 3-4 Statistical tests used in questionnaire data analysis**

<b>Statistical test</b>	<b>Usage</b>
<b>Descriptive statistics</b>	To calculate frequencies and percentages
<b>Inferential statistics:</b>	To determine the significant differences between the respondents in terms of IVs with one or more levels of nominal data (e.g. compare students' ages and perceptions of the library's role)
<b>1. Chi-square</b>	
<b>2. Mann–Whitney U test</b>	To determine the statistical differences between two IVs (e.g. males and females) and those between the IVs and the DVs (e.g. age group against familiarity with library services)
<b>3. Kruskal–Wallis test</b>	To find the significant statistical differences across the four academic disciplines and compare the score for various ordinal (dependent) variables for two or more groups (e.g. the differences between the four colleges with regard to the graduate students' perceptions of the library materials)
<b>4. Spearman's correlation</b>	To establish the strength of the relationship between two sets of data (e.g. the relationship between library visits and academic year or students' ages).

### 3.11.2 Phase II: qualitative analysis

Given the priority of the inductive approach in this study, a combination of qualitative analysis and case study techniques was adopted. Based on the domain analytic approach, Whitley's theory, thematic analysis and cross-case analysis were used. These techniques are discussed in the following sub-sections.

#### 3.11.2.1 The use of Whitley's theory - domain analysis

From the organisational management perspective, Whitley argues that the epistemic and social organisation of scholarly fields can be conceptualised within the two concepts of 'mutual dependence' and 'task uncertainty' (Whitley, 2000). The application of these two concepts reflects the degree of 'mutual dependence' between the researchers within the discipline in making competent and significant contributions to existing knowledge, and the degree of 'task uncertainty' in producing and evaluating that knowledge (Fry, 2006b). A variation in these two concepts explains the cultural difference between each discipline that shaped the graduate students' information use and information behaviour throughout the research process (Talja *et al*, 2007). Whitley (2000) argues that 'task uncertainty' and 'mutual dependence' are usually interrelated. For example, it is unlikely that there would be a high degree of 'mutual dependence' and 'task uncertainty' or a low degree of 'mutual dependence' and 'task uncertainty' at the same time. However, there is an exception to this rule, established by Talja

*et al* (2007), when these two dimensions are used initially and are analytically independent. This is the strength of Whitley's approach.

#### **3.11.2.1.1 Rationale for using Whitley's theory**

For this study, the researcher used Whitley's domain analytic approach to analyse the qualitative data, as discussed in Chapter 2 (Section 2.6.2). Using an explanatory tool such as Whitley's (2000) allows both the cultural and social aspects of the phenomena to be considered, which in turn allows a richer understanding of the cultural shaping of information use and information behaviour throughout the research process (Fry, 2004). In this study, the researcher applied Whitley's key domain analytic dimensions to identify the disciplinary differences in shaping the students' use of information resources and their information behaviour during the research process.

As the quantitative results indicate disciplinary differences regarding the use of library resources and services, Whitley's theoretical approach can provide a comparative framework under which the descriptions of and theories about these differences can be organised (Fry, 2006a). Focusing on disciplinary culture as the factor explaining the differences may help in reaching a clearer understanding of what lies at the heart of shaping the information use and behaviour of graduate students in the studied cases (Fry and Talja, 2007).

Therefore, it is suggested that the domain analytic approach of Whitley's theory can provide a powerful analytical tool for understanding the disciplinary differences that may impact information use and behaviour throughout the research process (Fry, 2006a). Although Whitley (2000) based his theory on a comparison of the disciplines, Fry (2006a) has shown that it can be used to explore research practices within specialist fields, which best fits the aims and objectives of this study.

#### **3.11.2.1.2 Applying Whitley's theoretical framework**

As seen from the discussion above, a comprehensive range of theoretical literature was consulted before Whitley's theory (2000) was selected as the main vehicle for applying the domain analytic concepts. Whitley's theory is one of the most common theories used by scholars (for example, Fry and Talja, 2004; Fry, 2006a, b; Matzat, 2004) to illustrate the factors that shape researchers' interactions with information and communication practices. Whitley (2000) proposes two dimensions to use when formulating the intellectual and social

organisation of scholarly fields, namely ‘mutual dependence’ and ‘task uncertainty’ (Chapter 2, Sections 2.6.2.1). In the same vein, cultural identity refers to the main factors that emerged from the studied field and shaped the researcher’s communication and information practices. Table 3-5 shows Whitley’s theoretical framework, which was used in this study as a pre-existing coding framework.

**Table 3-5 Implications of Whitley’s dimensions for information use (adopted from Fry and Talja, 2007, p.1678; extension of Whitley’s concepts to include information and communication practices)**

<b>Cultural identity</b>	<b>High mutual dependence and low task uncertainty</b>	<b>Low mutual dependence and high task uncertainty</b>
Domain boundaries	Clearly delineated and less vulnerable to tribal skirmishes	Fuzzy and subject to contestation; considerable mobility between topics and areas
Results	Not too difficult to discern and agree on	Ambiguous and subject to a variety of conflicting interpretations
Collaboration	A high people-to-problem ratio, goals tightly coordinated and integrated through a high degree of specialisation, contiguous with the parent discipline	A low people-to-problem ratio, decentralised coordination of goals subject to local variations in the division of labour
Literature reviews and field monitoring	Formalised; a requirement to demonstrate how the contribution fits in with existing research	Based on the choice of theory and discourse communities; greater variation in literature use and monitoring practices; greater reliance on personal informal networks in the choice and interpretation of the literature
Concentration of communication channels	Communication channels are more concentrated due to the relative stability of the research object	A greater diversity of communication channels due to the relative instability of the research object
Scatter of the literature	Relevant material is concentrated within the core disciplinary resources.	Relevant material can be found and is produced across diverse fields and resources.
Use of search methods	Direct searches of databases whose materials have been indexed, catalogued, and classified can be undertaken without major obstacles.	Semi-directed mode of searching; greater reliance on browsing and linking

The researcher in this study used Whitley’s theoretical framework in the earlier stages as a guide in collecting the data. Afterwards, it was used as a pre-existing coding framework to analyse the data. However, when designing the interview guide, the researcher did not include questions about the domain boundary that can help in developing a structural understanding of the differences in terms of the dependency characteristics between the four case studies. This is because the participants in this study are Master’s students and not faculty members who can provide the researcher with a clear picture about the disciplinary boundaries. This is discussed in Section 11.5.5 of Chapter 11, which covers the limitations of Whitley’s theory. A detailed

explanation of the interview data analysis process based on Whitley’s theory is provided in the following section.

### 3.11.2.2 Interview data analysis

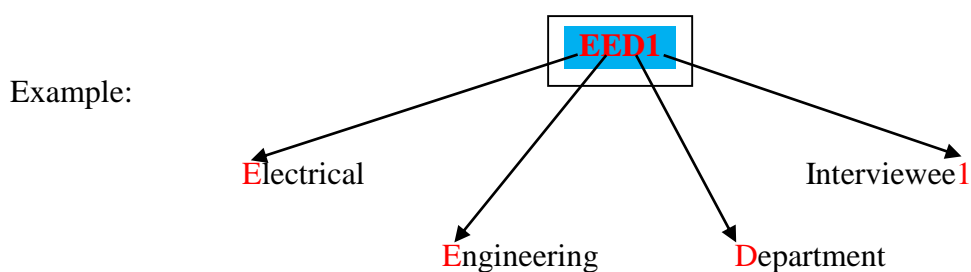
The data collected through the in-depth semi-structured interviews were transcribed and translated into English. Following this, they were analysed thematically using Whitley’s (2000) analytic concepts as a framework for the analysis. The analytic process was carried out as described in the following sub-sections.

#### Step 1: Transcription

The interviews were digitally recorded and then transcribed in Arabic because it is the mother tongue of both the researcher and the interviewees. The average length of the interviews was 40 to 80 minutes. The researcher listened to the taped interviews more than once to ensure they were transcribed in full. To check the transcripts for errors, the researcher listened back to the audio recordings while reading the transcripts.

#### Step 2: Labelling the transcripts

The researcher labelled the transcripts by choosing the first letter(s) of the name of the department followed by a D (for department) and then a number to indicate the participant. Therefore, electrical engineering participants were coded EED, public law participants were coded PLD, Islamic history participants were coded IHD and microbiology participants were coded MCD. The transcripts from each discipline were then numbered sequentially, for example, EED1, EED2, etc., as below.



### **Step 3: Translation**

As the research instruments were designed and used in an Arabic context, the researcher translated the transcripts before entering the data into NVivo 10.0 because the software does not support Arabic and also to share the interpretation with the supervisor. The researcher made every possible effort to present the interviewees' views as accurately as possible. In addition, a native Arabic speaker who specialises in the English language was consulted to confirm the accuracy of the translation and to validate its meaning.

### **Step 4: Coding the data**

Once the interviews were transcribed and translated from Arabic into English, the coding process commenced.

#### **a. Data familiarisation**

To gain an overview of the data coverage, the researcher initially familiarised herself with the data source to understand the participants' perspectives. During the first reading, the researcher made notes on major issues or ideas related to attitudes, behaviour or views as they emerged. The researcher then re-read the text line by line and segment by segment to examine it closely and facilitate a micro-analysis of the data (Ritchie *et al*, 2003). The familiarisation process continued for each case until the researcher had gained a deep understanding of the data set. Reading and making notes enabled the researcher to find her way easily around hundreds of pages of transcripts later in the analysis.

#### **b. Coding process**

Following the familiarisation, the researcher read the transcripts line by line and assigned phrases or labels (codes) to describe what she had interpreted in the passage as important. Throughout the coding process, the researcher tried to answer the question, 'What's going on there?' Coding can be defined as applying a brief verbal description to a small chunk of data (Ritchie *et al*, 2003). It is about managing, locating, filtering, categorising and querying the data rather than about data reduction (Bazeley, 2013). The translated data was imported into NVivo 10.0 and the coding procedure carried out. NVivo was selected for ease of data management and data analysis processing. In this study, the coding procedure progressed through two levels of coding: first cycle coding (open coding) and second cycle coding. The second level coding adopted two approaches, one of which built on the emergent codes from the first level phase (inductive). Whitley's theory (Table 3.5) was used to guide the coding and

categorisation of the data deductively. Figure 3.4 demonstrates the coding process for the raw data during the qualitative data analysis.

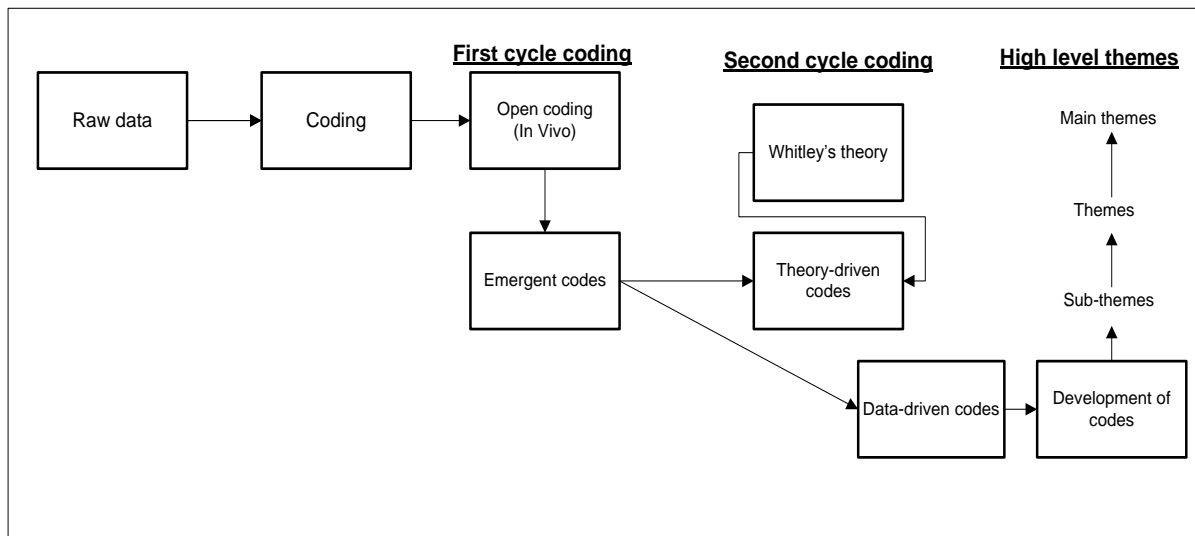


Figure 3-4 Raw data coding process

A detailed description of the coding procedure is provided in the following sub-sections.

### First cycle coding

First cycle coding is an initial stage that involves identifying and labelling the data, where the focus is on the data source. For the purpose of this study, the researcher used InVivo coding; this type of coding refers to words or short phrases from the actual language used by the participants themselves found in the data sets (Saldana, 2012). Using NVivo 10.0, the researcher highlighted every interesting word or phrase that she considered worth coding, based on her understanding of what the passage was about. In this stage, the emergent codes were created inductively as a way of locating the data to help to track them, as well as to cover the content of the interview transcripts. This kind of coding has the potential to be refined developed later for deeper analysis. A highlighted passage as an example of the first level of (InVivo) coding is presented in Figure 3.5 below.

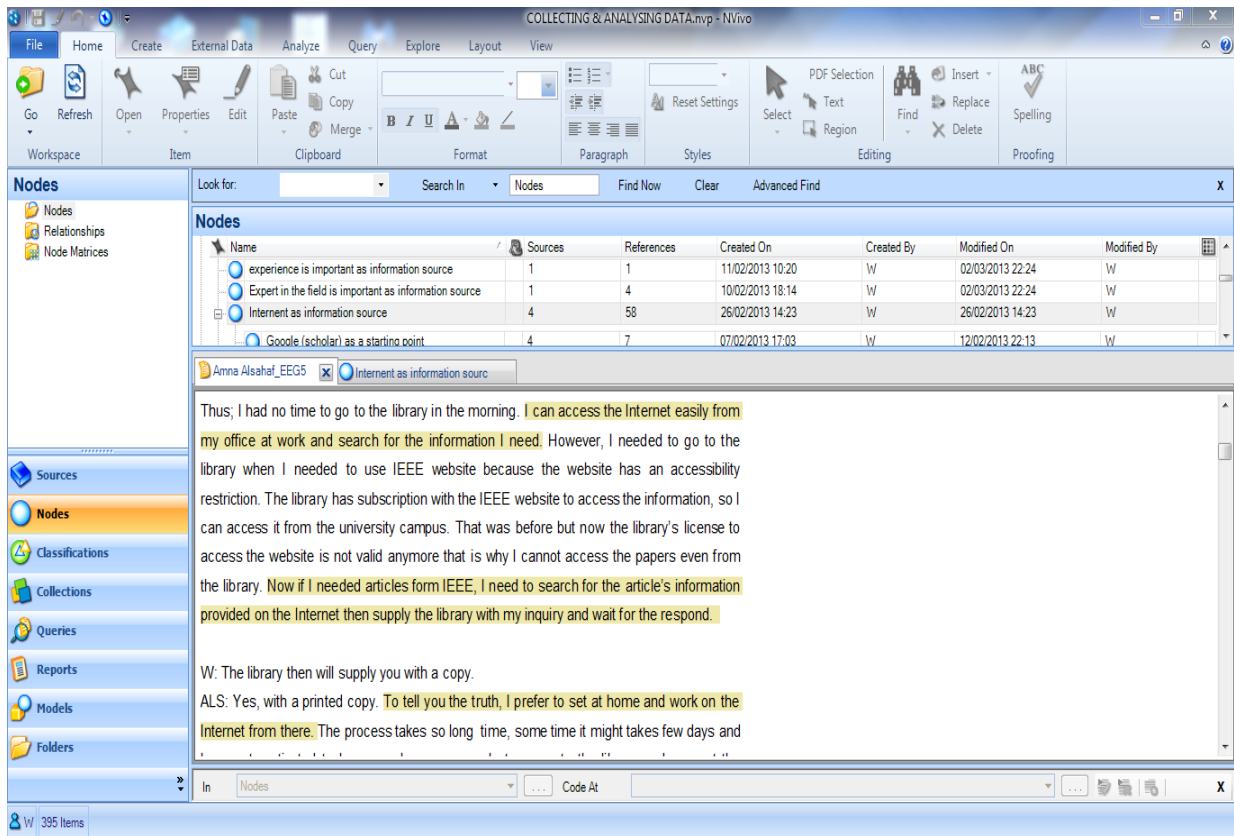


Figure 3-5 An NVivo document showing a short coded passage (first cycle coding)

## Second Cycle coding

The second cycle coding is a stage in which the researcher attempts to make sense of data by refining and interpreting the initial codes to develop more analytical categories. This was achieved by grouping the emergent codes from the first cycle coding and developing links between similar codes to make sense of the data and create the themes. The researcher's approach to analysing the data was a combination of the data-driven inductive approach of Frith and Gleeson (2004) and the theory-driven deductive approach of Boyatzis (1998). In a deductive approach, the themes tend to be driven by the researcher's theoretical, analytic interest in the area and by the pre-existing theoretical framework (Fereday and Muir-Cochrane, 2006). In this case, the researcher searched the data for materials that could be coded under headings related to Whitley's theoretical framework. An example for applying Whitley's framework of information practice as a guide for deductive coding while examining the engineering discipline data is provided in Appendix 12-A Table 3.6.

In an inductive approach, the themes are allowed to emerge directly from the data and may have little relationship with the specific questions the participants were asked. It is a process



of coding the data without trying to fit them into a pre-existing coding framework. The inductive codes were assigned to the segments of the data that described a new theme observed in the text (Boyatzis, 1998); this is described as focused coding (Saldana, 2012). Focused coding is an analytic process that includes searching for the most frequently repeated initial codes to develop the main categories or themes from the data sets (Saldana, 2012). The aim here is to cluster the number of first level codes by collapsing some of those that are similar into broader categories. An example of inductive codes that emerged while examining the engineering discipline data is provided in Appendix 12-B Table 3.7.

### **Constructing high-level themes**

The second cycle codes were refined and clustered into credible themes and sub-themes. The term ‘theme’ reflects the ‘outcome of coding, categorising, and analytical reflection’ (Saldana, 2012, p.139) and is usually used to describe the integration and relational accounts derived from the data that identify both the content and meaning (Bazeley, 2013). The main recurrent themes that reflected a group of codes were selected. For example, the main theme ‘library information services’ was selected to reflect the clustered theme of ‘training and support’ that developed from an identified group of sub-themes, such as ‘promotion of the services’, ‘self-training’ and ‘supervisor support’. The clustered themes were categorised based on their relationships to the main themes identified (see Appendix 7-D for further examples of themes). The researcher grouped similar themes together within a high-level conceptual construct that describes the most important aspect of the participants’ experience (Saldana, 2012). The researcher thematised the data to capture the complex phenomenon under investigation (information use) and to try to understand it from the graduate students’ perspectives. Theme construction was based on the nature of the research question, aims and objectives; the literature review and the need to develop a framework to describe the concept of the research topic under investigation (see Appendix 7-D for a list of themes). Themes can provide descriptions of information behaviour within KU culture and explain how the information use and behaviour occurs based on the participants’ accounts (Saldana, 2012), to explore the real situation regarding the research support role of KU library. The additional themes were separate from the pre-existing framework or used to expand a theme within it (Fereday and Muir-Cochrane, 2006). (See Appendix 12-B for a list of all the codes discovered in the interviews data as a code book).

### **Step 5: Developing a new analytical framework**

Based on the themes that emerged during the data analysis process, and in respect of the library's role in supporting research, it was necessary to develop a new conceptual framework that shaped the graduate students' library use throughout their research process. As the analysis developed, a new analytic framework was created. The resulting analytical framework has been used to structure the way in which the cases studied were described and analysed, based on seven themes that emerged from the data (cultural identity factors): 1) the nature of the discipline, 2) information needs, 3) study mode, 4) students' personal experience, 5) library services, 6) external sources and 7) financial adequacy. These were used as the main themes for analysing the data collected from the case studies. The initial analytic framework was then refined by examining the sub-themes that emerged from the data to formulate a final thematic framework. Structuring the thematic framework using the main theme and the sub-themes is in line with Ritchie and Spencer's (2002) notions. Each of the explored themes was synthesised by the researcher to refine its meaning and definition. The newly proposed themes that resulted from the analysed data suggest that cultural identity represents a set of factors that shape the patterns of graduate students' interactions with the library and information resources. This framework organises the pattern of the library's role in supporting research around a number of cultural elements of information use, based on the seven themes. The results of the analysis were presented using direct quotations from the participants' responses. Information use and behaviour were discussed within the seven categories of the new theoretical framework. The findings were reported for each discipline, Whitley's theory and key domain analytic concepts of 'mutual dependence' and 'task uncertainty' were applied to explain the variations in information use and behaviour across the studied disciplines, and then the studied cases were contrasted and compared using a cross-case analysis approach to identify the differences between them.

#### **3.11.2.3 Towards understanding the disciplinary shaping of information use and behaviour**

In order to develop an understanding of the cultural contexts of the intellectual field and how these shape the information use and information behaviour of graduate students, a domain analytic approach based on Whitley's theory was adopted. It is an appropriate analytical approach, given that the graduate students' research environment was concerned with their academic experience and their social interaction with sources and resources. Four case studies from diverse cultural fields were examined: electrical engineering, microbiology, Islamic

history and public law. The rationale for selecting fields distributed across the applied sciences, physical sciences, arts and humanities was the expectation that by making comparisons, an understanding of the mutual interaction between the academic research culture and pattern of information use and behaviour would be reached. Other than cultural diversity, the selection of these fields was made randomly, but they happened to provide some interesting comparisons.

Each case study uses information resources differently, and this is linked to the pattern of co-ordination and control in the research culture across the academic fields. The co-ordination and control of research problems, strategies, techniques, outcomes and reputations are important aspects that are influenced by the degree of ‘mutual dependence’ and ‘task uncertainty’ (Whitley, 2000). These are critical aspects in shaping the interdependency between tasks and groups in specific fields (Fry, 2006 a), and they play an important role in shaping the cultural characteristics of the scholarly field.

Although the researcher did not intentionally ask the participants about the nature of their discipline, several issues related to the cultural context of the studied disciplines emerged from the analysed data when the participants provided detailed accounts of their research environments. Based on the literature and what was discovered about the cultural characteristics at the field level of each case study, the researcher decided to categorise the case studies in relation to one another based on the presence of qualitative indicators, such as a hierarchy of the problems, the establishment of standardised research techniques and the degree of consensus about methods and integrative collaborative work. Therefore, the electrical engineering field is categorised as having a high degree of ‘mutual dependence’ and a low degree of ‘task uncertainty’, whilst microbiology is characterised as having a moderate degree of ‘mutual dependence’ and ‘task uncertainty’ compared to electrical engineering. However, Islamic history is characterised as having a low degree of ‘mutual dependence’ and a high degree of ‘task uncertainty’ compared to electrical engineering, while public law field is characterised as having a moderate degree of ‘mutual dependence’ and ‘task uncertainty’ compared to electrical engineering and Islamic history. A detailed description of the cultural characteristics of each case study and how they shaped the information use and information behaviour of the graduate students is discussed in Chapters 5, 6, 7 and 8 (Sections 5.5, 6.5, 7.5 and 8.5).

It should be noted that the comparative nature of Whitley’s framework makes it difficult to measure the levels of ‘task uncertainty’ and ‘mutual dependence’ in absolute terms, but as these

two concepts are interrelated it allows us to conclude, for example, that Islamic history has a low degree of ‘mutual dependence’ and a high degree of ‘task uncertainty’ compared to electrical engineering. The absence of a definitive measure for the levels of the two concepts makes it difficult for the researcher to characterise the fields that fall somewhere between the dichotomous combinations of Whitley’s theory in relation to each other, such as the multidisciplinary field of microbiology and the interdisciplinary field of public law). This is discussed in Section 11.5.5 of Chapter 11, which deals with the limitations of Whitley’s theory.

#### **3.11.2.4 Looking for patterns a cross the data - cross-case analysis**

Cross-case analysis is a qualitative method widely used in the social sciences (McGuiggan *et al*, 2008). By definition, it refers to comparisons across different cases (Ryan, 2012). Miles and Huberman (1994) define it as searching for patterns, similarities and differences across cases with similar variables and similar outcome measures, while Ring *et al* (2011) argue that it is a synthesis method that uses tables or matrices to summarise data across qualitative case studies, and Yin (2009) defines it as a method of comparing and synthesising research cases that involves at least two cases. The selected cases can be conducted as independent studies or as nested units within one case study.

According to Yin (2009), a cross-case study approach explains the causal link in real-life situations. A single case study with nested units of analysis would enable the researcher to explore the case while considering the various factors (cultural identities) that influence library use. Looking at the nested units situated within a larger case is powerful when considering that the data can be analysed both within the cases and across all cases (cross-case analysis). This can better illuminate a holistic perspective (Gerring, 2007; Blaxter and Jack, 2008) and enhance the researcher’s ability to capture any novel findings that may exist in the data (Eisenthart, 1989).

Qualitative cross-case analysis can be informed by various theoretical approaches. Miles and Huberman (1994, p.599) claim that there are few guidelines for conducting cross-case analysis. The analysis is caught in ‘...the steady tension between the unique, contextually specific nature of a single site, and the need to make sense across a number of sites’. Regarding this approach, Miles notes that accurate but thin generalisations across cases are likely to be the only result, while Eisenthart (1989) asserts that the key to effective cross-case analysis is to examine the data in many different ways. One technique is to select categories or dimensions, and then seek within-group similarities and intergroup differences. Another technique is to select pairs of

cases and then list the similarities and differences between them. Looking for differences between similar cases can break simplistic frames. In the same vein, searching for similarities between different cases can lead to a more sophisticated understanding. The results of these comparisons can be new categories that the researcher did not anticipate.

#### **3.11.2.4.1 The cross-case analysis strategy**

The cross-case analysis used in this study employs the process that Yin (2009) calls ‘replication logic’ or ‘pattern-matching’. This broad approach is unique to the inductive, case-based strategy of theory elaboration. As the process was initially guided by the conceptual framework, each of the studied cases (EED, MCD, IHD and PLD) was examined for its own uniqueness while considering the graduate students’ interaction with their college library within the context of KU and the characteristics of the surrounding environment (cultural identity factors). The cases were compared to identify any similarities and differences between them and any subsequent consequences for the theoretical framework. The process of theory elaboration was repeated several times to explain all the relevant aspects regarding the support role of KU libraries and to eliminate any contradictory explanations (Bazeley, 2013).

### **3.12 Use of mapping technique**

As this study required a wide exploratory focus on the situation of inquiry, the researcher used a mapping technique, a rich picture, to promote reflection and analysis of the data content. A rich picture is a simple, free-form diagram that uses symbols, sketches or ‘doodles’ to present a complex situation. It was developed by Peter Checkland at Lancaster University as part of the soft system methodology (SSM) during a research programme from 1960 to 1970 and is within the socio-technical tradition of system design (Monk and Howard, 1998). It is a useful method of communicating and developing ideas about an area of uncertainty to gain understanding. The need to draw a rich picture emerged as a vital step for further analysis. The researcher used the visualisation technique (e.g. creative thinking, brain storming, imagery, etc.) to draw rich pictures of the complex role of KU libraries in supporting graduate students’ research. Drawing using different visualisation techniques enabled the researcher both to call things to mind and to record insights about the situation (Checkland, 1981; Checkland and Scholes, 1990). The purpose of using this method is to create a pictorial representation of the elements that need to be considered in a particular situation, as in studying library resources, users’ behaviour and the interactions between them. It is important to note that this method is used to help articulate the situation and not to provide solutions (Monk and Howard, 1998).

For an example of the rich picture depicted by the researcher to understand the situation of the Engineering College library, see Appendix 10.

### **3.13 Writing up the case study report**

In order to report the case study findings, the researcher started writing up the individual cases first and then reported the cross-cases based on the similarities and differences between them. In the early stage, after analysing the collected data, all the themes arising from the analysis of the studied cases relating to the library's role, based on Whitley's theoretical framework, were gathered, and each case was reported separately. Next, the researcher moved on to report the cross-cases, depending on the developed analytic framework. At this stage, after reporting the cross-case examples (which are considered part of the findings chapter in most theses) the researcher referred to the related literature in the area to synthesise the meanings and seek extra evidence to support or contradict her argument.

### **3.14 Validity and reliability**

For this study, it was necessary to understand the differences between quantitative and qualitative validity and reliability. In quantitative research, instrument reliability and validity are very important for reducing the errors that might arise from measurement problems in the research study. Reliability refers to the extent to which the measures draw out consistent responses (De Vaus, 2007), while validity refers to 'how well the research instrument measures what it purports to measure' (Nunnally and Bernstein, 1994, p.83). These two measures (validity and reliability) were taken into account to meet the requirements of the study.

#### **3.14.1 Questionnaire reliability and validity**

A reliability analysis of the items measured on a Likert-type scale was conducted, and the internal consistency and reliability (Cronbach's alpha) of the items was measured using a five-point Likert scale (see Appendix 4). The corrected items (total correlation and alpha if an item is deleted) were examined following the procedure of De Vaus (2007). Reliability analysis indicates that all the 38 items that represent the five dimensions of library support for research measurement (response to library use; type of materials used; user satisfaction; familiarity with library use; and role of the library) appeared to be worthy of retention, except for question 27. The removal of item 27 increased the Cronbach's alpha from 0.75 to 0.77. The Cronbach's alpha coefficient for the overall sub-scales was 0.89, indicating good internal consistency. An alpha exceeding 0.7 indicates that the scale is reliable (Nunnally and Bernstein, 1994).

A reliability analysis provided information about which items needed rewording or needed to be removed from the scale. This helps in assessing how well the various items in a measure appear to reflect the perceptions of graduate students about their college library services in supporting their research. Based on this, some of the questionnaire items were revised slightly following the pilot study. One question regarding the frequency of library visits was added to the demographic information. Question 10, which reads ‘On average, how often do you visit the library?’, was divided into two questions. The phrase ‘How to’ was added to question 27, and item ‘f’ was changed from workstation to e-books. Question 32 was removed from the questionnaire because it did not give any important information about library support for research. Another open-ended question was added: ‘What do you particularly value about the university library services?’ The research instrument was completely revised to prepare it for use in the actual study.

#### **3.14.1.1 Construct validity**

Construct validity can be used to test whether the results of the measures match what was expected based on the theoretical concepts (De Vaus, 2007). To confirm the construct validity of the measure, a factor analysis of the Likert-type scale was conducted after the pilot study (see Appendix 5). It was performed using principal component analysis (PCA) with a minimum eigenvalue of 1 as the cut-off point for the total factor, with a scree plot supporting the extraction of the components. The factor analysis indicates that the instruments containing five factors and three items did not meet psychometric standards (Q8, Q17 and Q27). However, it was decided to delete item 27 from factor 5 and retain Q8 and Q17 because they might give important information about library research support; therefore, the researcher was reluctant to eliminate these two items from the questionnaire. In addition, the item’s total correlations, correcting for item overlap, were calculated to evaluate the construct validity, which overall was found to exceed the threshold of 0.4. Correlations greater than 0.4 indicate good construct validity (Nunnally and Bernstein, 1994).

#### **3.14.1.2 Content validity**

Content validity shows to what extent the questionnaire items and scores from these questions are representative of all possible questions about research support for graduate students. Information Studies faculty members examined the wording of the questionnaire, which helped the researcher assess whether the questions are relevant to what they actually intended to measure, if it was the right way to gain the required information and if the questionnaire was

well designed. Further evidence of content validity was produced by the outcome of the PCA of the responses for the questionnaire subscales. The findings indicate that the questionnaire had satisfactory reliability and validity.

### **3.14.2 Case study reliability and validity**

Validity in qualitative research does not carry the same meaning as it does in quantitative research. Qualitative validity means checking the accuracy of the findings by applying certain procedures. A reliability check indicated that the approach used by the researcher was consistent across different research projects and researchers (Gibbs, 2007). In qualitative research, validity is based on determining whether the findings are ‘true’ from the researcher’s point of view or from that of the participants or audience, and it occurs in different steps in the research process (Creswell, 2014). Different approaches have been suggested by qualitative researchers (Creswell and Miller, 2000; Gibbs, 2007; Lincoln *et al*, 2011; Creswell, 2014) to determine validity; however, little consistency has been found and each suggests new sets of criteria. One approach to examining validity and reliability is to apply the criteria used by Meyer (2001) in quantitative research, such as inter-subjectivity, construct validity, internal and external validity and reliability.

#### **3.14.2.1 Inter-subjectivity**

Inter-subjectivity refers to the way in which we interpret, organise and reproduce particular forms of social life and social cognition (Duranti, 2010). As a novice researcher, the researcher’s experience of conducting a qualitative case study was that it was difficult to focus on the research question and data analysis, as the research question ‘How do KU libraries support graduate students’ research?’ was vague and broad. Therefore, using a framework based on Whitley’s theory before collecting the data for the second phase of the study was useful in guiding the data collection and analysis. However, it was important to be open-minded and receptive to new and unexpected data. The researcher also consciously searched for negative evidence when conducting the interviews (Miles and Huberman 1994), and asked problem-oriented questions. Presenting contradictory evidence helped to make the findings more realistic and valid.

Another issue related to assessing inter-subjectivity is whether the interpretation of the case study can be tracked (Miles and Huberman, 1994). In response to this, the researcher described the case study data collection, procedure and processing in detail and presented the analysed



data in written form using quotations from participants extracted from the interview transcripts to support the data interpretation.

### **3.14.2.2 Construct validity**

According to Yin (2009, p.40), construct validity refers to ‘identifying operational measures for the concepts being studied’. With this kind of validity, the important issue is the accuracy of the application of a given concept to the established facts (Meyer, 2001). A flexible and responsive interaction between interviewer and participant underlines the strength of qualitative research (Sykes, 1990). Covering the research topic from different angles, making the questions clear to the interviewees and enabling the researcher to probe the meaning of concepts are great advantages when exploring construct validity. To promote construct validity, the researcher asked open-ended questions to seek mixed answers and to enable the interviewees to frame their views and become engaged in the conversation. The researcher also used probing questions to enrich the participants’ responses and to obtain detailed answers regarding the role of KU libraries in supporting their research.

Construct validity can be strengthened by employing the nested studies approach, triangulation and feedback loops (Leonard-Barton, 1990). One of the main construct validity examinations is provided by the variation across different groups of users. Therefore, the use of nested units of analysis enables the researcher to validate the stability of the construct across cases (Leonard-Barton, 1990). Because the case study consists of more than two nested cases and a sub-unit of analysis, this helps the researcher establish the stability of the case across the cases, which strengthens the construct validity of the study as a whole.

### **3.14.2.3 Internal validity**

According to Yin (2009: 42), ‘internal validity is mainly a concern for explanatory case studies’. As the type of case study used in this research is exploratory rather than explanatory, this logic is inapplicable, as it is not pertinent to this type of causal situation.

### **3.14.2.4 External validity (generalisability)**

One of the major criticisms of single case studies is that they offer a poor basis for generalisability (Yin, 2009), as the intention is not to generalise the findings to individuals, groups or organisations outside those under study (Gibbs, 2007). In the current study, generalisability is not supported by the research, as the type of qualitative approach used is a

single case and not multiple cases. Therefore, the findings of this research cannot be generalised to a wider population at KU or to other Arabic or international contexts.

#### **3.14.2.5 Reliability**

In the context of qualitative research, reliability concerns two questions—whether the same study produces the same findings when carried out by two independent researchers and whether the study would yield the same findings if repeated using the same respondents and researcher (Sykes, 1990). The aim of examining the reliability of a qualitative study is to minimise errors and bias. Yin (2009) states that documenting the qualitative procedure by using a case study protocol is one way of enhancing the reliability of qualitative research. Gibbs (2007) suggests some qualitative procedures for increasing reliability, including constantly reviewing the transcripts, creating definitions for the coding (codebook) and comparing the data with the code.

The researcher addressed the reliability requirement by discussing the sampling procedure, data collection, data analysis and her experience of using and developing an interview guide and framework, as mentioned previously in Sections 3.9, 3.10 and 3.11.

### **3.15 Ethical considerations**

This study raises some issues related to ethics, such as informed consent, confidentiality, anonymity and the right of participants to withdraw at any time and to access the research results. The primary focus of ethics in survey and interview studies is to ‘ensure confidentiality of the data and communication to participants of any constraints on the investigator’s ability to maintain confidentiality’ (Beauchamp, 1982, p.79). To address any ethical concerns, the study required formal approval from both the University of Sheffield and KU, where the study took place. Approval was obtained from both institutions before commencing the research.

#### **3.15.1 Informed consent**

The interview participants were asked to read the participant information sheet and give informed consent before commencing the interview. Signing the consent form allows the investigator to use any quotes from the participants’ responses during the data analysis or in writing up the case study (see Appendix 6A and 6 B).

### 3.15.2 Protecting privacy

The anonymity of the participants was protected by numerically coding each returned questionnaire and keeping the responses confidential. The selected respondents were assigned false names for use in the description and reporting of the results. Protecting the identity of the study participants encourages them to disclose any information needed without stress. The data obtained from the interviews were transcribed immediately after the interviews, and the participants remained anonymous. The questionnaires were returned anonymously in print format to the researcher. None of the data used in the study can be attributed to specific individuals, all the data were stored securely and confidentiality was guaranteed.

### 3.15.3 Emerging issues

In conducting the case study, three ethical concerns were addressed during the research process. These related to culture, gender and religion, as the context of Kuwaiti society is that of a Muslim country. According to cultural, religious and gender considerations, women are not allowed to interview men face-to-face when alone. This issue might cause some problems for a researcher in the data collection stage. To manage the ethical concerns, the researcher chose to conduct the interviews in a public place (KU) to encourage the male interviewees to participate in the research. This helped them to feel more comfortable and to cooperate in answering the interview questions. In addition, respect for people is an essential consideration when seeking to foster participants' cooperation and to motivate them to answer questions. However, the institution's identity was retained with permission. The basic approaches to managing ethical issues (informed consent, assuring privacy and case identities) were employed to help minimise the risks associated with case study research.

## 3.16 Challenges in the study

- As the researcher is a non-native English speaker, the first challenge she faced during the study was the need to read a massive amount of literature in English and express ideas and arguments in academic writing. This involved familiarising herself with new concepts that were essential to her research area and new vocabulary in a foreign language, which was time-consuming and demanding. This is discussed in Section 11.5.1 of Chapter 11 dealing with linguistic limitations.
- The second challenge occurred when distributing the questionnaires and was related to the venue and timing of the graduate students' lectures. The lectures all took place at

different venues on the KU campus and at similar times in the afternoon and evening. To overcome this situation, the researcher cancelled her attendance at some lectures and rearranged her visits to other departments to cover all departments in the four colleges.

- The third challenge was related to conducting the interviews. It was difficult to obtain the telephone numbers and emails of the graduate students from the CGS because of ethical considerations related to Kuwaiti culture. Therefore, the researcher was forced to travel to each targeted college across the KU campus and visit the individual departments to obtain a list of the graduate students enrolled in each department and their telephone numbers after showing the Dean's permission letter.
- The fourth challenge was associated with the researcher's skill in using the SPSS and NVivo software programs. As the researcher took her Master's degree in Kuwait, she had no background in the new data analysis techniques and therefore had to learn to use programmes, which proved very time-consuming.

### **3.17 Summary**

This chapter has provided a detailed account of the research methodology, design, strategy and data collection techniques used to achieve the study aims and objectives. This study involves the use of mixed methods data collection, in which both quantitative and qualitative techniques were used (a questionnaire survey, open-ended questions, semi-structured interviews and Whitley's framework). The sampling methods have also been explained for both the quantitative and qualitative phases, and details about the data collection and fieldwork have been provided. The chapter has also presented an overview of the qualitative data analysis, which includes a thematic approach, Whitley's domain analytic approach, cross-cases analysis and quantitative data analysis that includes various tests.

## CHAPTER 4 – QUESTIONNAIRE DATA ANALYSIS

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### 4.1 Introduction

This chapter presents the findings of the quantitative data collection aimed at determining the extent to which KU college libraries support graduate students' research. The first phase of the study commenced with surveying the graduate students (taught and research graduate students) to investigate the available services provided by KU libraries to support research. Quantitative data was collected via a questionnaire. The questionnaire was developed based on previous studies (e.g. Mueggenstamm, 1999; Chrazstowski and Joseph, 2006; RIN, 2007, 2008). It consists of six sections and ends with three open questions. The first section of the survey contains items relating to the demographic and academic backgrounds of the respondents, whilst the remaining five sections were created to address the nine research questions of the study. Two quantitative analysis techniques were employed (descriptive statistics and inferential statistics), and SPSS was used to analyse the questionnaire data. The chapter begins by presenting the descriptive analysis, followed by the inferential analysis and the qualitative analysis of the open questions.

### 4.2 Descriptive statistics

Descriptive statistics are used to represent the characteristics of an entire population or of a sample and the relationship amongst different variables based on systematic observation to address specific research questions (Pallant, 2010). This section provides descriptive analyses of the data obtained from the sample of KU graduate students. This includes the frequencies and percentages of the categorical and multiple response variables.

SPSS 17.0 was used to facilitate the organising, coding and analysis of the data collected. Prior to the actual analysis, the collected data were screened and cleaned to check for errors. Every case with a missing value was identified with a missing value code of 9. With this in mind, whenever a statistical analysis was performed, the cases with the missing value were automatically omitted from the analysis. Once the data was checked for accuracy, data manipulation techniques were used to calculate total scale scores for the five-point Likert scale (the score for each item range from 5 strongly agree to 1 strongly disagree). Any negatively worded items were reversed and the scores for each variable from the items were added up to give an overall score for each dimension, for example, use of the library and its services, types of materials used and user satisfaction, familiarity with library services and perceived role of the library. This was done to prepare the data for analysis (Pallant, 2010).

Reliability tests were also performed on each dimension to determine their internal consistency and thus their reliability. One item was dropped from the analysis (item 7 in Section 1 of the survey); it is logically inconsistent with the first dimension items because it has no connection with the quality of library services. The results in Table 4.1 show that the values of the Cronbach's alphas are all greater than 0.8, thus indicating that all the dimensions are reliable and can be used for further analysis. As De Vaus (2007, p.20) states, 'an alpha of 0.7 is normally considered to indicate a reliable set of items'. Table 4.1 shows the value of the Cronbach's alpha for each aspect of the library.

**Table 4-1 Reliability test of the libraries' supporting dimensions**

<b>Dimensions</b>	<b>Number of items</b>	<b>Cronbach's alpha</b>
Library services provision	6	0.84
Types of materials	9	0.88
User satisfaction	9	0.91
Familiarity with services	6	0.89
Perceived library role	4	0.82

The findings of the descriptive analysis are presented for each section of the survey. The first section comprised items relating to the participants' demographic and academic backgrounds, whilst the other five sections were constructed with the aim of addressing the first six key questions of this study.

#### **4.2.1 Demographics**

Of the 587 graduate students in the four colleges studied, 578 participated in the study. This translates into a response rate of 98%, which is very high for survey research. Permission was obtained from the appropriate authorities to attend the first 15 minutes of class to distribute the questionnaire to the graduate students. A letter from the educational institution was used to assure the respondents that the study was approved by the institution. The respondents were also assured of confidentiality. The above considerations may explain the high response rate without follow-up.

Of the 578 graduate students who participated in this research, 313 (54.2%) are female and 265 (45.8%) are male. The respondents' ages are equally distributed between under 26 years old and 26–35 years old; 276 (49.4%) participants fell into these age groups, and 7 (1.3%) were 36–45 years old. However, 19 (3.3%) participants did not respond to this question. Notably, most of the graduate students in the sample began their Master's studies immediately or shortly after completing their Bachelor's degree.

#### 4.2.2 Academic background

Of the 578 participants, the highest proportion (257 or 44.5%), were engineering students, whilst law students formed the lowest proportion with only 95 respondents (16.4%). Figure 4.1 shows the breakdown of the graduate students by college.

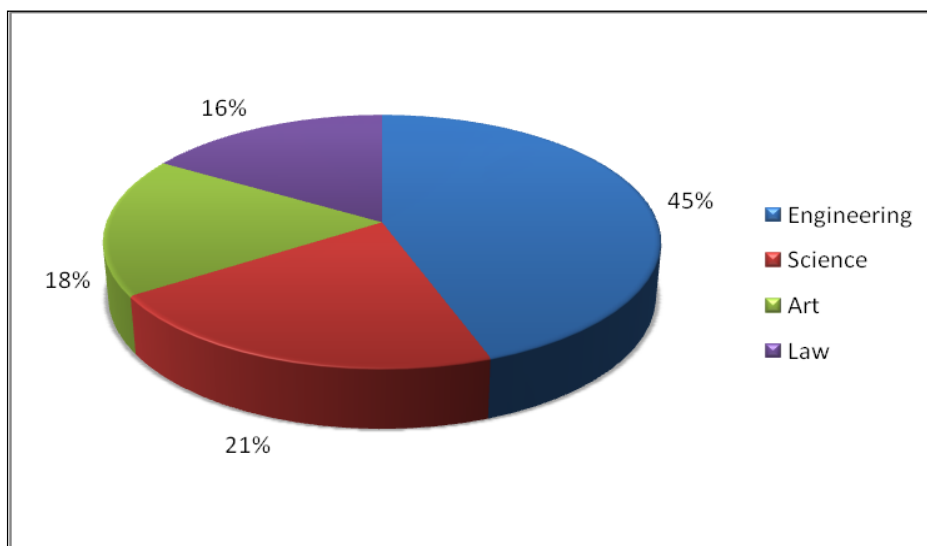


Figure 4-1 Percentage of the respondents in each college

The majority of the participants in the sample were studying for a Master's degree (549; 95%), whilst only 29 (5%) were studying for a PhD. The low proportion of PhD students participating in the survey reflects the fact that few students were registered as PhD students in the CGS. More than half of the students in the sample (364 or 63%) were enrolled as part-time students.

#### 4.2.3 Academic year of study

A large number of the participants (242 or 42.5%) were in their second year of study. Figure 4.2 shows the breakdown of graduate students by academic year.

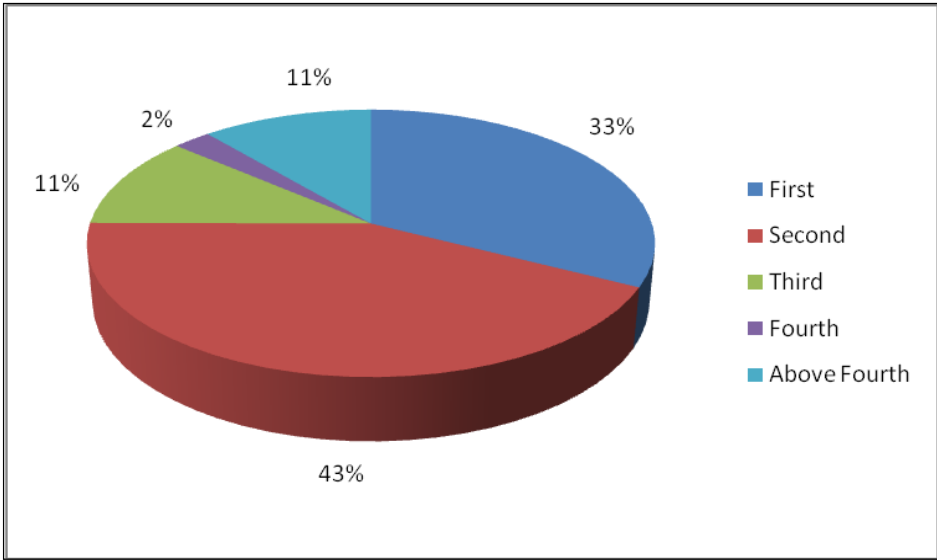


Figure 4-2 Percentages of respondents by academic year

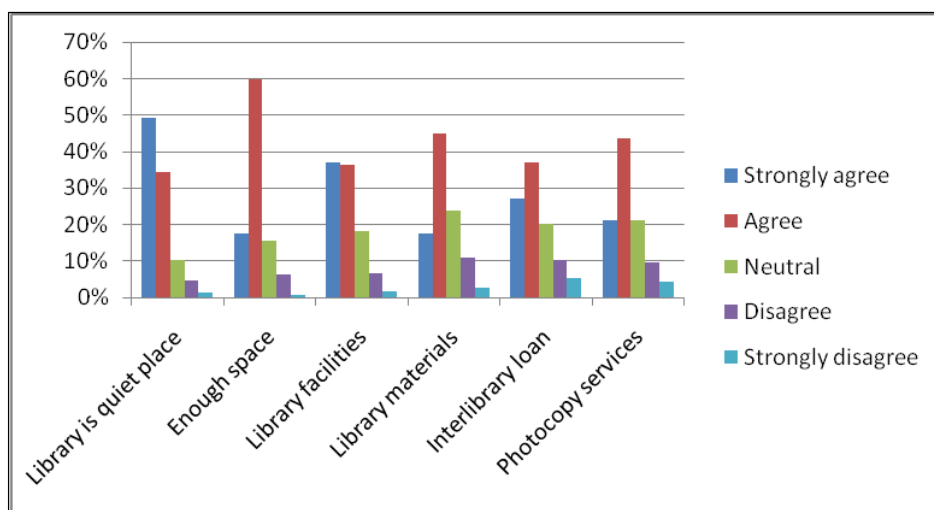
#### 4.2.4 Library visits

The respondents were asked about their frequency of visiting the university library. Almost 205 (36%) of the respondents physically visit the library ‘frequently’, whilst 191 (33%) do so ‘occasionally’, 76 (13.1%) do so ‘rarely’ and 74 (12.8%) do so ‘regularly’. Thirty-two participants (5.5%) stated that they never visit the library. It should be noted that the ‘regularly’ option of this variable being the highest option in the scale (see Appendix 2-B). The wording used in this scale—‘regularly’ and ‘frequently’—may be interpreted differently by people and may have affected the reliability of the data. This is discussed in Section 11.5.4 of Chapter 11, which deals with the limitations of data collection.

#### 4.2.5 Library provisions for supporting research

In this section, it was intended that the questionnaire elicit the graduate students’ perceptions about the college libraries’ services in order to answer the first research question ‘Do the services offered at the college libraries support graduate students’ research?’ A five-point Likert scale was used to measure whether respondents agreed or disagreed with a sequence of statements. The possible responses ranged from ‘strongly agree’ to ‘strongly disagree’. Figure 4.3 summarises the responses to the different library aspects.



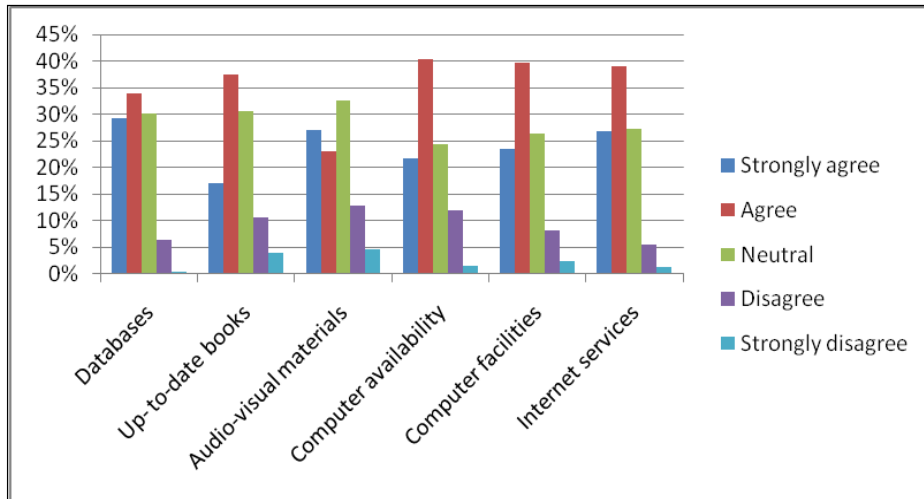


**Figure 4-3 Different aspects of library provision**

Figure 4.3 highlights a similar pattern of agreement (agree or strongly agree) amongst the graduate students in terms of library materials, photocopying services, ILL services and library facilities. Almost two-thirds of the respondents agreed that those aspects were provided by the library to facilitate their research. Markedly, the distribution of agreement responses is slightly higher for providing adequate space, along with a quiet environment that helps in achieving their research work. However, it was interesting to find that in some cases, approximately one-fifth or a quarter of the respondents gave neutral responses. Relatively few students registered disagreement (between 6% and 16%) with these library aspects, but even this low amount of disagreement must be a concern for the libraries.

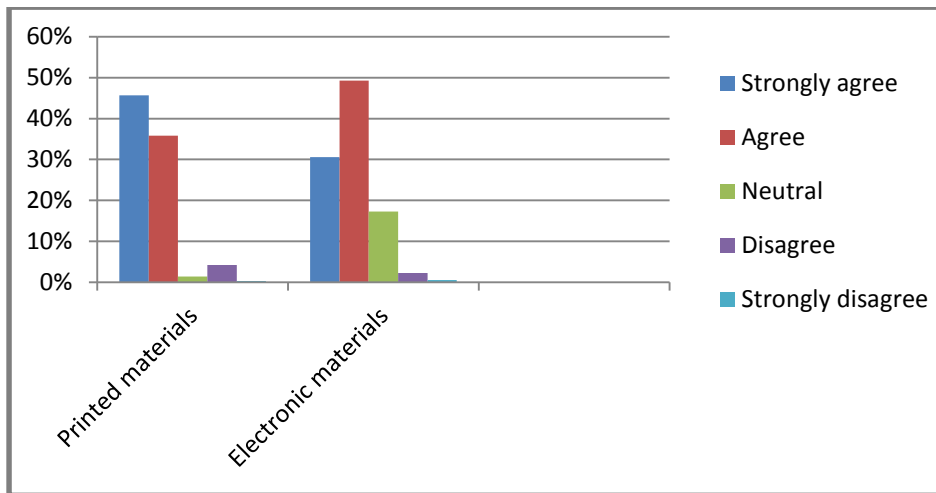
#### 4.2.6 Types of library materials to support research

This section of the questionnaire was created with the aim of addressing the second key research question ‘What types of materials does the library provide to support graduate students’ research?’ Again, a five-point Likert scale was used to measure the respondents’ agreement with a sequence of statements. When the respondents were asked about the resources provided by the library to support their research, the pattern of responses was fairly similar to the previous set of statements. However, the proportion of neutral responses reached 30% or more for three of the seven aspects. Overall, the respondents confirmed that the library provided a variety of resources, including a wide range of databases and up-to-date books in their field, along with efficient Internet service and sufficient computer facilities. Notably, the responses about audio-visual materials were quite different, which may be related to the various needs and the relevance of this type of material in different disciplines. Figure 4.4 summarises the respondents’ opinions concerning the library resources of KU.



**Figure 4-4 Different types of library materials**

The third research question is ‘To what extent do graduate students think that the provided materials are valuable for their research?’ Items 8 and 9 from Section 2 of the survey provided the data for this question. Of the 578 respondents in the sample, 471 (81.5%) agreed that the print materials are essential to meet their research needs, whilst only 4.5% disagreed and 1.4% were neutral. On the other hand, 79.9% of the graduate students in the sample agreed that e-resources are very important to meet their research needs, whilst 2.7% disagreed and 17.3% remained neutral. The results suggest that both print and electronic documents are valuable for supporting the research of graduate students. Figure 4.5 summarises the respondents’ opinions concerning the types of materials important for their research.



**Figure 4-5 Respondents' perceptions of the important types of materials for research**

#### **4.2.7 Users' satisfaction with library resources and services**

This section of the questionnaire was created with the objective of measuring the graduate students' satisfaction with KU libraries' resources and services and to answer the fourth key research question: 'To what extent are graduate students satisfied with the library resources and services offered to support their research?' A five-point Likert scale was used. The pattern of responses was fairly similar to that of the previous statements, with the proportion of neutral responses reaching 30% or more for three of the nine aspects of user satisfaction. Overall, the respondents were satisfied with the library hours, library instructions, the number of library staff and the qualifications of the reference and subject librarians. However, the responses concerning the library collection were different, which may be attributed to the different needs of students in different disciplines and the availability of books on the shelves. Relatively few students (between 5% and 14%) indicated they were dissatisfied with the library resources and services, but even this low level of dissatisfaction must be of concern to the libraries. Figure 4.6 summarises the graduate students' satisfaction with the library resources and services.

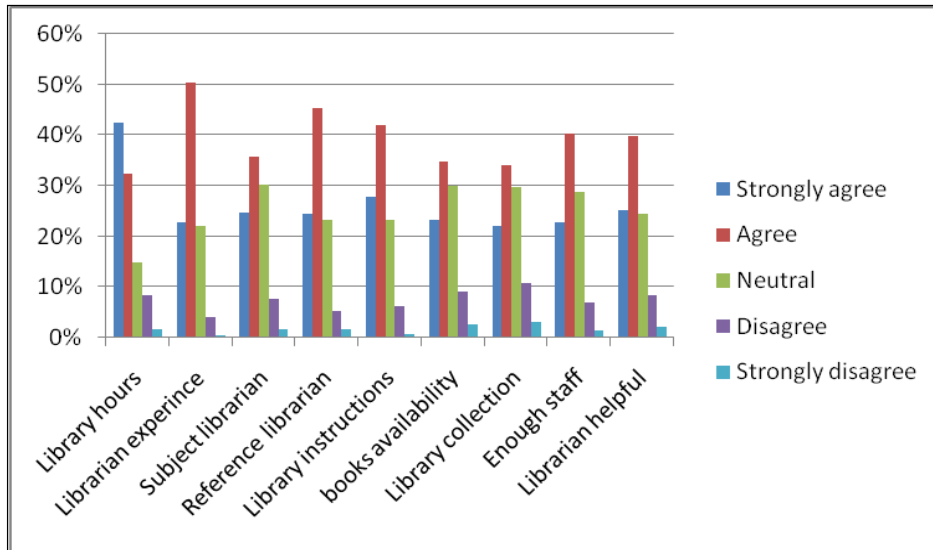


Figure 4-6 Respondents' satisfaction with the library resources and services

#### 4.2.8 Familiarity with the use of library services

Regarding familiarity with using specified library services, the graduate students in the sample indicated a high level of agreement, which helps answer the fifth research question: 'To what extent are graduate students familiar with using the library services and resources?' Figure 4.7 summarises the results for this question.

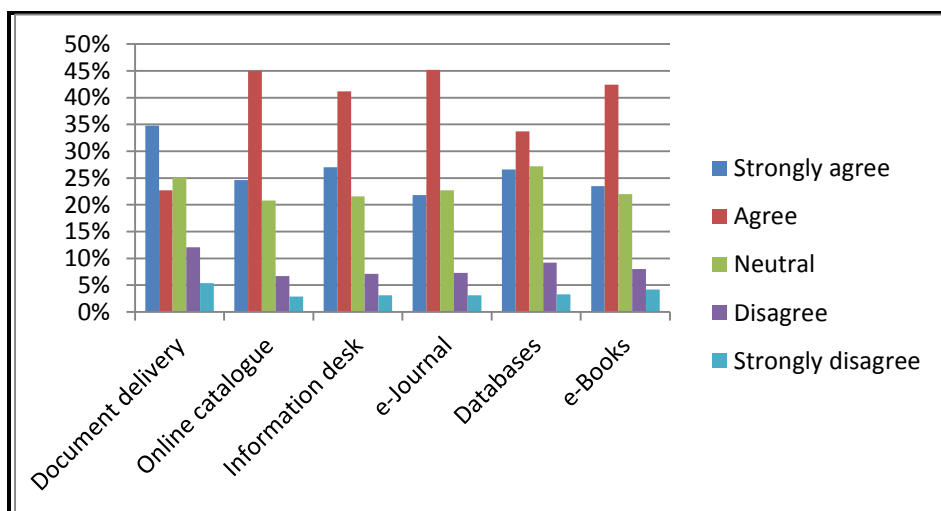


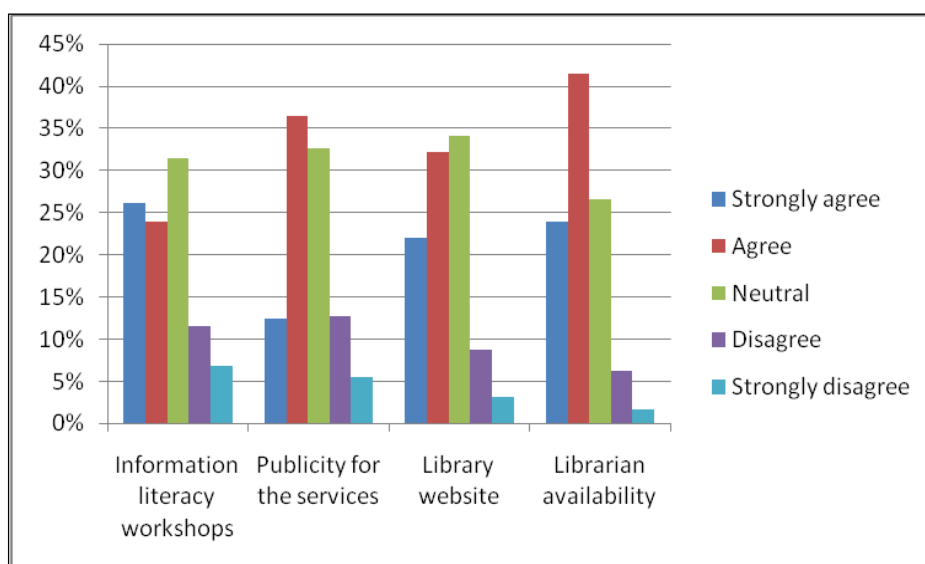
Figure 4-7 Familiarity with specific library services and resources

The figure shows similar patterns of responses for four of the six services specified, with approximately two-thirds of the respondents confirming their familiarity by agreeing or strongly agreeing with the statements. The distribution of the responses was slightly different for DD and databases; however, it is interesting that in each case, between one-fifth and one-quarter of the respondents gave a neutral response. Relatively few students (between 10% and

18%) indicated they were unfamiliar with the services and resources, but even this low level of unfamiliarity must be of concern to the libraries.

#### 4.2.9 Perceived library role in supporting research

In this section of the questionnaire, the students were questioned regarding their perceptions of the role played by the university libraries in supporting their research. This section was created to answer the sixth key research question, ‘What possible roles do librarians play in guiding and supporting graduate students in their research?’ Figure 4.8 summarises the opinions concerning specific activities, thus reflecting various aspects of the role played by participants’ college libraries in supporting their research.



**Figure 4-8 Aspects of the libraries’ role in supporting research**

Figure 4.8 shows a broadly similar pattern of agreement (agree or strongly agree) regarding information literacy workshops, marketing library services and providing a supportive library website, with approximately half of the respondents confirming that those aspects are implemented by their college libraries and support their research. The distribution of responses was slightly different for the availability of librarians when needed. It is interesting that the proportion of neutral responses reached 30% or more for three of the four aspects of the perceived role of the library. The proportion of disagreement was between 8% and 19%, which must be of concern to the libraries.

### 4.3 Inferential statistics

This section presents the inferential analysis of the survey. Several inferential tests were performed with the aim of establishing whether the observed differences between the DVs and the IVs were statistically significant. In order to examine research questions 7, 8 and 9, Mann–Whitney U tests, chi-square tests of independence, Spearman’s correlations and Kruskal–Wallis tests were performed. Notably, follow-up tests were carried out when the Kruskal–Wallis tests were considered statistically significant. The IVs of this study are:

- IV1: Age
- IV2: Gender
- IV3: Academic year
- IV4: Mode of study
- IV5: Type of degree
- IV6: College
- IV7: Library visits

The DVs are:

- DV1: Library services provision
- DV2: Types of library resources
- DV3: User satisfaction
- DV4: Familiarity with library services
- DV5: Perceived role of the library

#### 4.3.1 Statistical testing

When conducting an empirical study, it is important to establish whether the results obtained are statistically significant. With this in mind—and prior to conducting any appropriate statistical tests—a statistical analytical procedure known as a one sample Kolmogorov–Smirnov test (one-sample K–S test) was carried out on respondents’ scores with the aim of testing the normality of the distribution. The test results indicate that the significance level (*P*-value) for the five aspects of the academic library’s supporting role scores is less than 0.05. Moreover, if the *P*-value of the variables calculated is less than 0.05, non-normality of the distribution is then assumed (De Vaus, 2007). Consequently, the use of non-parametric tests for comparing the groups—such as a Kruskal–Wallis analysis of ranks (for comparing one categorical IV with continuous DVs), a Mann–Whitney U test (for comparing more than two

IVs) and a chi-square test of independence—are justified. Table 4.2 shows the significance level of each library aspect.

**Table 4-2 The test of normality (Kolmogorov–Smirnov test)**

<b>Variables</b>	<b>Test statistics</b>	<b><i>P</i>-value</b>
Library services provision	0.121	<0.001
Types of materials	0.98	<0.001
User satisfaction	0.105	<0.001
Familiarity with services	0.141	<0.001
Perceived library role	0.117	<0.001

Although it is normal to consider the use of parametric statistical tests as the best practice, it must be noted that such testing encompasses specific characteristics, such as the normal distribution in the population. However, if the presumptions concerning data quality are not valid, there remains no other choice than to use less powerful non-parametric tests, such as a Kruskal–Wallis test or a Mann–Whitney U test (De Vaus, 2007).

This study also investigates the correlation coefficient ( $r$ ) between two independent categorical variables, such as library visits and academic year (measured at the ordinal level). Correlation analysis reflects the strength and direction of the linear relationship between the two variables; however, the correlation does not involve causation but only confirms variation between two or more variables (Pallant, 2010). The most common measure of correlation is the Pearson product-moment correlation (called Pearson’s  $r$ ), which is used for continuous variables (interval level). Importantly, if either or both of the two variables concerned in a correlation analysis is/are non-parametric (not measured at the interval level), a parametric correlation—such as Pearson’s correlation—cannot be used; rather, in such a case, a non-parametric correlation such as a Spearman’s rank order correlation (Spearman’s rho) can be used to establish the strength of the relationship between two sets of data (Field, 2009). Notably, the value for a positive correlation can fall between 0 (no correlation) and 1 (perfect correlation). Negative correlations are also possible: a correlation of  $-1$  indicates there is a perfect negative linear relationship between variables (Pallant, 2010).

### 4.3.2 Testing the differences in colleges and students' ages regarding students' perceptions of the library role in supporting their research

Regarding the seventh research question, 'Are there any significant differences in students' perceptions of their college libraries regarding the roles in supporting their research?' five hypotheses were generated, each of which needed to be tested and validated. These hypotheses test the differences between colleges in regard to students' perceptions concerning each dimension of the library supporting roles.

#### **Research hypothesis**

##### **H1: There are differences in the perceptions of the library provisions between colleges**

This hypothesis was established to test the first dimension of the library's supporting role (Part 2, Section 1 in the survey). It was created to investigate the graduate students' perceptions about library services.

**H0:** There is no significant difference in the perceptions about library services amongst graduate students from different colleges.

**H1:** There is a significant difference in the perceptions about library services amongst graduate students from different colleges.

The first analytical tool used to test the hypothesis relating to research question 7 was the chi-square test of independence. This is commonly used to determine whether a significant relationship exists between two categorical (dependent or independent) variables with two or more categories. Once the chi-square test was performed, questions with multiple categories were further divided into fewer groups based on their similarities; therefore, all the items were collapsed into three categories (agree, neutral and disagree). It is thought that grouping similar categories increases the chances of meeting the test criteria and, as a rule of thumb, at least 80% of the cells should have expected frequencies of 5 or greater (Pallant, 2010). Following this further categorisation, all the results completely fulfil the criteria of the chi-square test, with the exception of one assumption, which was violated (cross-tabulating item 9 with colleges), that is, when three cells (25%) have an expected count of less than 5. Therefore—and only with the aim of meeting the chi-square criteria—this item was collapsed into two categories (agree and disagree).



The chi-square test was performed with the objective of observing the differences between individuals from different academic disciplines in terms of their perceptions regarding the role of the library in supporting their research. Table 4.3 illustrates the number and percentage of graduate students choosing 4 and 5 on a scale of 1–5, with 5 being ‘strongly agree’ and 1 being ‘strongly disagree’, when asked about the provision of library services. The yellow highlighting indicates the highest percentages, whilst the red highlighting indicates the lowest ones.

**Table 4-3 Agreement with the statements according to college**

	<b>Engineering</b>	<b>Science</b>	<b>Arts</b>	<b>Law</b>	<b>% of Total</b>	<b>X<sup>2</sup></b>	<b>Sig</b>
Library is a quiet place	213 (82.9%)	107 (87%)	81 (78.6%)	82 (86.3%)	483 (83.6%)	9.29	0.158
Library has enough space	198 (77%)	100 (81.3%)	79 (76.7%)	71 (74.7%)	448 (77.5%)	3.92	0.687
Library facilities are satisfactory	200 (77.8%)	91 (74%)	70 (68%)	65 (68.4%)	426 (73.7%)	8.36	0.213
Library has all research materials	181 (70.4%)	94 (76.4%)	58 (56.3%)	28 (29.5%)	361 (62.5%)	67.37	0.000
Relying heavily on interlibrary loan services	164 (63.8%)	91 (74%)	50 (48.5%)	67 (70.5%)	372 (64.4%)	19.86	0.003
Reliability of the photocopying services	167 (65%)	92 (74.8%)	67 (65%)	49 (51.6%)	375 (64.9%)	15.29	0.018

The test results show there was no significant difference between the four colleges (engineering, science, arts and law) in terms of respondents’ views of the library as a quiet environment ( $X^2 = 9.29$ ,  $df = 6$ ,  $p = .158$ ) and the sufficiency of the space ( $X^2 = 3.92$ ,  $df = 6$ ,  $p = .687$ ) in which to carry out their research. There was also no significant difference in regard to students’ satisfaction with the efficiency of the library facilities in general ( $X^2 = 8.36$ ,  $df = 6$ ,  $p = .213$ ). The results suggest that most of the graduate students from the four colleges are content with the physical environment of the library in terms of space, quietness and the facilities as they relate to supporting their research activities.

***The library has all the research materials needed***

Just over 62% agreed that the library provides graduate students with the research materials they need. Based on the chi-square test, there was a significant difference between students from the four colleges in terms of their responses to this statement ( $X^2 = 67.37$ ,  $df = 6$ ,  $p < 0.001$ ). For instance, respondents from the College of Science (76.4%) were more likely to agree with the statement, followed by those from the College of Engineering (70.4%), then

those from the College of Arts (56.3%) and finally those from the College of Law (29.5%). The results indicate that the research materials provided by the law library are viewed as being not sufficient to fulfil the research needs of the graduate students.

#### ***Relying on ILL services when using the library***

Of the sample, 64.4% confirmed that they rely heavily on the ILL services to obtain the research materials they need. The chi-square test showed there is a significant difference between the students from the four colleges in terms of using the ILL services ( $X^2 = 19.86$ ,  $df = 6$ ,  $p = 0.003$ ). Those from the College of Science (74%), the College of Law (70.5%) and the College of Engineering (63.8%) were more likely to use the ILL services than those from the College of Arts (48.5%). In this regard, the results suggest that graduate students from arts colleges are less likely to use ILL services compared to graduate students from other colleges.

#### ***The reliability of photocopying services when using the library***

Regarding the statement, 'The photocopying services are reliable', 64.9% of the respondents agreed. Based on the chi-square test, there was a significant difference between the students from the four colleges in responding to this statement ( $X^2 = 15.29$ ,  $df = 6$ ,  $p < 0.05$ ). Those from the College of Law (51.6%) were less likely to agree that the photocopying services in their college library are more reliable than those in the College of Science (74.8%) or the College of Engineering (65%) or the College of Arts (65%). The results indicate that law graduate students are less likely to consider the photocopying services of their college library as being reliable compared to those at other colleges.

The second analytic tools used were Kruskal–Wallis tests performed sequentially to compare the score for two or more groups (Pallant, 2010). Individuals from different academic disciplines were compared using the Kruskal–Wallis tests, the results of which were found to be statistically significant ( $X^2 = 26.35$ ,  $df = 3$ ,  $P < 0.001$ ) for all aspects of library services (see Table 4.19 a and Table 4. 19 b in Appendix 11).

In order to determine which colleges are statistically significant, post-hoc Mann–Whitney U tests were conducted consecutively. These were performed to establish which groups differed from the others (Pallant, 2010). However, colleges groups that had no significant differences in terms of results were not reported in this study.

The tests reveal that there is a significant difference between the colleges of engineering and law, engineering and arts, science and arts and science and law concerning the library provisions in supporting research. Table 4.4 shows the results of the Mann–Whitney U tests.

**Table 4-4 Mann–Whitney U test results for colleges against library provisions**

<b>Colleges</b>	<b><i>Mann–Whitney U</i></b>	<b><i>z-value</i></b>	<b><i>p-value</i></b>
Engineering vs. Arts	11327.500	-2.149	0.032
Engineering vs. Law	8935.500	-3.877	<0.001
Science vs. Arts	4891.000	-2.970	0.003
Science vs. Law	3534.500	-5.025	<0.001

Based on the Mann–Whitney U test results, the Science Library is more likely to provide support for graduate students’ research (median = 4.33, n = 123) than the Arts Library (median = 3.83, n = 103,  $U = 4891.000$ ,  $P < 0.05$ ) and the Law Library (median = 3.66, n = 95,  $U = 3534.500$ ,  $P < 0.001$ ), whereas the Engineering Library is significantly more likely to provide support for graduate students’ research (median = 4.16, n = 257) than the Arts Library (median = 3.83, n = 103,  $U = 11327.500$ ,  $P < 0.05$ ) and the Law Library (median = 3.66, n = 95,  $U = 8935.500$ ,  $P < 0.001$ ). The results indicate that the Science Library is more likely to fulfil the research needs of graduate students in terms of its provisions, while the Law Library is less likely to do so. Based on the results of this test, the null hypothesis can be rejected.

**H2: There are differences between the colleges in terms of students’ perceptions of the types of materials provided.**

This hypothesis was established to test the second dimension of the library’s supporting role (Part 2, Section 2 in the survey) and to elicit graduate students’ perceptions regarding the types of information resources available to support their research.

**H0:** There is no significant difference in the perceptions of graduate students from different colleges regarding the types of materials provided.

**H1:** There is a significant difference in the perceptions of graduate students from different colleges regarding the types of materials provided.

A chi-square test was performed to observe the differences between participants from different academic disciplines. Table 4.5 shows the numbers and percentages of graduate students

providing positive responses when questioned about the types of materials provided to support their research.

**Table 4-5 Percentages of respondents from each college who agreed with the statements**

	<b>Engineering</b>	<b>Science</b>	<b>Arts</b>	<b>Law</b>	<b>% of Total</b>	<b>X<sup>2</sup></b>	<b>Sig</b>
Print materials are important	194 (75.5%)	104 (84.6%)	92 (89.3%)	81 (85.3%)	471 (81.5%)	15.05	0.02
Electronic materials are important	197 (76.7%)	96 (78.0%)	91 (88.3%)	78 (82.1%)	462(79.9%)	6.82	0.078
The library subscribes to a wide range of databases	179 (69.6%)	89 (72.4%)	63 (65.0%)	34 (35.8%)	365 (63.1%)	45.16	0.000
The library provides me with up-to-date books	158 (61.5%)	79 (64.2%)	53 (51.5%)	26 (27.4%)	316 (54.7%)	45.81	0.000
The library offers audio-visual resources	155 (60.3%)	72 (58.5%)	46 (44.7%)	16 (16.8%)	289 (50.0%)	75.06	0.000
Availability of computers	176 (68.5%)	84 (68.3%)	62 (60.2%)	37 (38.9%)	359 (62.1%)	35.80	0.000
Computer facilities meet my needs	178 (69.3%)	87 (70.7%)	64 (62.1%)	36 (37.9%)	365 (63.1%)	37.04	0.000
Internet services are efficient	189 (73.5%)	84 (68.3%)	65 (63.1%)	43 (45.3%)	381 (65.9%)	27.07	0.000
Variety of information resources	174 (67.7%)	83 (67.5%)	63 (61.2%)	36 (37.9%)	356 (61.6%)	37.89	0.000

The table above shows the significant relationship in the data between the respondents from the four colleges and the types of materials provided based on chi-square testing. The results indicate there is no significant difference between the participants from the four colleges in terms of considering e-resources as vital to fulfilling their research needs.

Participants from different academic disciplines were also compared using the Kruskal–Wallis test, the results of which were statistically significant ( $X^2 = 48.14$ ,  $df = 3$ ,  $P < 0.001$ ) for all types of library materials (see Table 4.19 a and Table 4. 19 b in Appendix 11).

A follow-up Mann–Whitney U test was carried out, the results of which reveal a significant difference between engineering and law, science and law and arts and law in terms of the types of resources provided by the library. Table 4.6 shows the results of the Mann–Whitney U test.

**Table 4-6 Mann–Whitney U test results for colleges against types of library materials**

<b>Colleges</b>	<b>Mann–Whitney U</b>	<b>z-value</b>	<b>p-value</b>
Engineering vs. Law	6778.000	-6.417	<0.001
Science vs. Law	3136.000	-5.871	<0.001
Arts vs. Law	3077.000	-4.515	<0.001

The tests results reveal that the Law Library is significantly less likely to provide fundamental types of resources to support its graduate students' research (median = 3.33, n = 95) than the Arts Library (median = 3.88, n = 103,  $U = 3077.000$ ,  $P < 0.001$ ), the Engineering Library (median = 4.0, n = 257,  $U = 6778.000$ ,  $P < 0.001$ ) and the Science Library (median = 4.11, n = 123,  $U = 3136.000$ ,  $P < 0.001$ ), which are significantly more likely to support their graduate students with the required materials. The results suggest that the Science Library is more likely to meet the research needs of graduate students by providing them with the fundamental resources in their field than the Law Library. The null hypothesis can therefore be rejected based on the results of this test.

**H3: There are differences in the user satisfaction with library resources and services amongst the colleges**

This hypothesis was created to test the third dimension of the library's supporting role (Part 2, Section 3 in the survey). It was established to explore the graduate students' satisfaction with library resources and services.

**H0:** There is no significant difference between the colleges in terms of users' satisfaction with library resources and services.

**H1:** There is a significant difference between the colleges in terms of users' satisfaction with library resources and services.

The chi-square test was used to discover the differences in user satisfaction with library resources and services between graduate students from different academic disciplines. Table 4.7 shows the numbers and percentage of graduate students who were satisfied with library resources and services.

**Table 4-7 Percentages of respondents from each college who agreed with the statements**

	<b>Engineering</b>	<b>Science</b>	<b>Arts</b>	<b>Law</b>	<b>% of Total</b>	<b>X<sup>2</sup></b>	<b>Sig</b>
Library hours are convenient	188 (73.2%)	100 (81.3%)	70 (68.0%)	75 (78.9%)	433 (74.9%)	10.96	0.089
Librarians are experienced in the borrowing system	174 (67.7%)	96 (78.0%)	86 (83.5%)	67 (70.5%)	423 (73.2%)	13.66	0.034
Library has specialist librarian	163 (63.4%)	89 (72.4%)	64 (62.1%)	34 (35.8%)	350 (60.6%)	36.30	0.000
The reference librarian assists with my enquiries	169 (65.8%)	94 (76.4%)	84 (81.6%)	57 (60.0%)	404 (69.9%)	22.58	0.001
Library instructions are helpful	176 (68.5%)	86 (69.9%)	71 (68.9%)	70 (73.7%)	403 (69.7%)	5.22	0.51
Availability of books on the shelves	161 (62.6%)	88 (71.5%)	64 (62.1%)	24 (25.3%)	337 (58.3%)	56.50	0.000
Library collection fulfils my research needs	163 (63.4%)	87 (70.7%)	53 (51.5%)	22 (23.2%)	325 (56.2%)	66.90	0.000
The library has enough staff	165 (64.2%)	91 (74.0%)	76 (73.8%)	32 (33.7%)	364 (63.0%)	50.02	0.000
Library staff/librarians are helpful	168 (65.4%)	90 (73.2%)	79 (76.7%)	39 (41.1%)	376 (65.1%)	40.32	0.000

The table illustrates the significant relationship in the data between the four colleges regarding their users' satisfaction with library resources and services based on chi-square testing. The results indicate there were no significant differences between the respondents across the four domains (engineering, science, arts and law) concerning their satisfaction with library hours or library instructions.

Graduate students from different academic domains were again compared using the Kruskal-Wallis test, the results of which were statistically significant ( $X^2 = 40.46$ ,  $df = 3$ ,  $P < 0.001$ ) (see Table 4.19 a and Table 4. 19 b in Appendix 11).

Post-hoc Mann-Whitney U tests were performed sequentially, the results of which indicate significant differences between engineering and law, science and law and arts and law regarding user satisfaction. Table 4.8 shows the results of the Mann-Whitney U testing.

**Table 4-8 Mann–Whitney U test results for colleges against user satisfaction**

<b>Colleges</b>	<b>Mann–Whitney U</b>	<b>z-value</b>	<b>p-value</b>
Engineering vs. Law	7964.000	-5.015	<0.001
Science vs. Law	2971.000	-6.228	<0.001
Arts vs. Law	2853.500	-5.071	<0.001

The test results show that science graduate students were significantly more likely to be satisfied with the library resources and services (median = 4.22, n = 123) than law graduate students (median = 3.44, n = 95,  $U = 2971.000$ ,  $P < 0.001$ ). Law graduate students (median = 3.44, n = 95) were less likely to be satisfied with their college library resources and services than engineering (median = 4.0, n = 257,  $U = 7964.000$ ,  $P < 0.001$ ) and arts (median = 4.0, n = 103,  $U = 2853.500$ ,  $P < 0.001$ ) graduate students. The results indicate that the Science Library is most likely to fulfil the research needs of its graduate students through the provision of resources and services, whilst the Law Library is the least likely to do so. Based on the test results, the null hypothesis can be rejected.

**H4: There are differences in the users’ familiarity with specific library services between the colleges**

This hypothesis was established to test the fourth dimension of the library’s supporting role (Section 4, Part 2 of the survey). It was constructed to investigate users’ familiarity with specific library services, such as DD, bibliographic databases, e-journals, online catalogues, e-books and the information desk.

**H0:** There is no significant difference between the colleges in terms of graduate students’ familiarity with the use of specific library services.

**H1:** There is a significant difference between the colleges in terms of graduate students’ familiarity with the use of specific library services.

In order to establish the differences between respondents from different academic disciplines, the chi-square test was employed. Table 4.9 shows the numbers and percentage of respondents who confirmed their familiarity with the specified library services.

**Table 4-9 Percentages of respondents from each college who agreed with the statements**

	<b>Engineering</b>	<b>Science</b>	<b>Arts</b>	<b>Law</b>	<b>% of Total</b>	<b>X<sup>2</sup></b>	<b>Sig</b>
Document delivery	156 (60.7%)	95 (77.2%)	54 (52.4%)	27 (28.4%)	332 (57.4%)	60.32	0.000
Online catalogue	161(62.6%)	98 (79.7%)	89 (86.4%)	54 (56.8%)	402 (69.6%)	33.66	0.000
Information desk	165 (64.2%)	98 (79.7%)	74 (71.8%)	57 (60.0%)	394 (68.2%)	18.27	0.006
E-journals	161 (62.6%)	97 (78.9%)	79 (76.7%)	50 (52.6%)	387 (67.0%)	28.65	0.000
Databases	153 (59.5%)	91 (74.0%)	79 (76.7%)	26 (27.4%)	349 (60.4%)	69.52	0.000
E-books	165 (64.2%)	96 (78.0%)	69 (67.0%)	51 (53.7%)	381 (65.9%)	17.25	0.008

The table illustrates the significant relationships in the data between the participants related to their familiarity with the use of library services among the studied disciplines. A Kruskal–Wallis test was conducted to determine the significant differences between participants across the four disciplines. The results show a significant difference between the participants ( $X^2 = 52.40$ ,  $df = 3$ ,  $P < 0.001$ ) (see Table 4.19 a and Table 4.19 b in Appendix 11).

Post-hoc Mann–Whitney U test results suggest a significant difference between engineering and science, engineering and law, science and law and arts and law graduate students regarding their familiarity with library services. Table 4.10 shows the results of the Mann–Whitney U testing.

**Table 4-10 Mann–Whitney U test result for colleges against library services**

<b>Colleges</b>	<b>Mann–Whitney U</b>	<b>z-value</b>	<b>p-value</b>
Engineering vs. Science	12745.500	-3.072	0.002
Engineering vs. Law	8507.500	-4.388	<0.001
Science vs. Law	2514.500	-7.238	<0.001
Arts vs. Law	2500.000	-5.961	<0.001

The test results indicate that science graduate students were significantly more likely to be familiar with the use of a specific library service (median = 4.16,  $n = 123$ ) than engineering (median = 4.0,  $n = 257$ ,  $U = 12745.500$ ,  $P < 0.05$ ) graduate students, whilst law graduate students were much less likely to be familiar with the use of specific library services (median = 3.33,  $n = 95$ ) than those in engineering (median = 4.0,  $n = 257$ ,  $U = 8507.500$ ,  $P < 0.001$ ), arts (median = 4.0,  $n = 103$ ,  $U = 2500.000$ ,  $P < 0.001$ ) and science (median = 4.16,  $n = 123$ ,  $U = 2514.500$ ,  $P < 0.001$ ). The results indicate that science graduate students were more likely to be familiar



with the use of specific library services than law graduate students. Therefore, the earlier null hypothesis can be rejected.

**H5: There are differences between the colleges in their users’ perceptions of the role of the library**

The hypothesis was established in order to test the fifth dimension of the library’s supporting role (Section 5, Part 2 of the survey). It was established to help draw out the perceptions of the graduate students regarding the perceived role of their college library in supporting their research.

**H0:** There is no significant difference between the colleges in terms of the perceived role of the library in supporting research.

**H1:** There is a significant difference between the colleges in terms of the perceived role of the library in supporting research.

In an attempt to investigate the differences between the respondents at the different colleges, the chi-square test was used. Table 4.11 highlights the numbers and percentages of graduate students providing positive responses when questioned about the perceived role of the library in supporting their research.

**Table 4-11 Percentages of respondents from each college who agreed with the statements**

	<b>Engineering</b>	<b>Science</b>	<b>Arts</b>	<b>Law</b>	<b>% of Total</b>	<b>X<sup>2</sup></b>	<b>Sig</b>
The library offers information literacy workshops	158 (61.5%)	79 (64.2%)	42 (40.8%)	10 (10.5%)	289 (50%)	96.49	0.000
Services offered by the library are Publicized	139 (54.1%)	78 (63.4%)	48 (46.6%)	18 (18.9%)	283 (49.0%)	54.15	0.000
Library website is helpful	151 (58.8%)	79 (64.2%)	57 (55.3%)	26 (27.4%)	313 (54.2%)	36.08	0.000
Availability of librarians	164 (63.8%)	88 (71.5%)	75 (72.8%)	51 (53.7%)	378 (65.4%)	15.42	0.017

The table shows the significant relationships in the data between the participants related to the perceived role of the library across the four disciplines. A Kruskal–Wallis test was conducted to establish whether there was a significant difference between the respondents across the four

disciplines. A statistically significant difference was found amongst the four disciplines ( $X^2 = 60.37$ ,  $df = 3$ ,  $P < 0.001$ ) (see Table 4.19 a and Table 4.19 b in Appendix 11).

Post-hoc Mann–Whitney U testing showed a significant difference between engineering and science, engineering and law, science and arts, science and law and arts and law concerning the perceived role of the library. Table 4.12 shows the results.

**Table 4-12 Mann–Whitney U test results for colleges the perceived role of the library**

Colleges	Mann–Whitney U	z-value	p-value
Engineering vs. Science	13827.000	-1.992	0.046
Engineering vs. Law	6682.500	-6.559	<0.001
Science vs. Arts	4922.500	-2.910	0.004
Science vs. Law	2532.000	-7.218	<0.001
Arts vs. Law	3052.000	-4.592	<0.001

The test results reveal that science graduate students were significantly more likely to perceive that their college library played a role in supporting their research (median = 4.0,  $n = 123$ ) compared to those in engineering (median = 3.75,  $n = 257$ ,  $U = 13827.000$ ,  $P \leq 0.05$ ), arts (median = 3.50,  $n = 103$ ,  $U = 4922.500$ ,  $P < 0.05$ ) or law (median = 3.0,  $n = 95$ ,  $U = 2532.000$ ,  $P < 0.001$ ). Law graduate students were much less likely to perceive that their college library plays a significant role in their research (median = 3.0,  $n = 95$ ) compared to those in engineering (median = 3.75,  $n = 257$ ,  $U = 6682.500$ ,  $P < 0.001$ ) and arts (median = 3.50,  $n = 103$ ,  $U = 3052.000$ ,  $P < 0.001$ ). The results suggest that science graduate students were more likely to perceive that their college library played a role in their research activity than law graduate students. Based on the results of this test, the null hypothesis relating to this dimension can be rejected.

Regarding the eighth research question, ‘Are there any significant differences across the students’ age groups regarding the participants’ perceptions of the role of libraries in supporting their research?’, five hypotheses were created for testing and validation. These hypotheses also test the differences across the respondents’ age groups for all aspects of the library’s supporting role.

### **Research hypotheses**

**H1: There are differences in the perceptions of the library provision across the age groups**

**H0:** There is no significant difference in the perceptions of graduate research students regarding library provision across the different age groups.

**H1:** There is a significant difference in the perceptions of graduate research students regarding library provision across the different age groups.

Respondents from different age groups were also compared using a Kruskal–Wallis test, the results of which were statistically significant ( $X^2 = 36.67$ ,  $df = 2$ ,  $P < 0.001$ ) for each aspect of library provision (see Table 4.20 a and Table 4.20 b in Appendix 11).

Post-hoc Mann–Whitney U testing shows a significant difference between the respondents under 26 and those aged 26–35 in terms of their perceptions regarding library provision in support of their research. The older age group was more likely to indicate that library provision was able to support their research (median = 4.17,  $n = 276$ ) than the younger one (median = 3.83,  $n = 276$ ,  $U = 26776.500$ ,  $P < 0.001$ ). Accordingly, the first null hypothesis can be rejected.

**H2: There are differences in the perception on the types of materials provided across age groups**

**H0:** There is no significant difference in the perceptions about the types of materials provided for graduate research students across the different age groups.

**H1:** There is a significant difference in the perceptions about the types of materials provided for graduate research students across the different age groups.

A Kruskal–Wallis test was used, the results of which were statistically significant ( $X^2 = 31.33$ ,  $df = 2$ ,  $P < 0.001$ ) for each aspect regarding the types of materials provided (see Table 4.21 a and Table 4.12b in Appendix 11).

Post-hoc Mann–Whitney U testing indicates a significant difference amongst the participants under 26 and those aged 26–35 in regard to their perceptions about the types of resources provided by the library. The older age group was notably more likely to feel that the library provides fundamental types of resources to support their research (median = 4.11,  $n = 276$ ) compared to the younger age group (median = 3.55,  $n = 276$ ,  $U = 27934.500$ ,  $P < 0.001$ ). The results suggest that the older age group tends to agree that the library provides them with sufficiently diverse information resources compared to the younger one. Consequently, the second null hypothesis can be rejected.

**H3: There are differences in user satisfaction with library resources and services across age groups.**

**H0:** There is no significant difference across the different age groups in terms of user satisfaction with the library resources and services.

**H1:** There is a significant difference across the different age groups in terms of user satisfaction with the library resources and services.

A Kruskal–Wallis test was conducted, the result of which was statistically significant ( $X^2 = 40.16$ ,  $df = 2$ ,  $P < 0.001$ ) for each aspect of user satisfaction (see Table 4.22 a and Table 4.22b in Appendix 11).

Post-hoc Mann–Whitney U testing also revealed a significant difference across the participants under 26, those aged 26–35 and those aged 36–45 in terms of user satisfaction. Table 4.13 shows the results of the Mann–Whitney U test.

**Table 4-13 Mann–Whitney U tests results for age groups against user satisfaction**

Age groups	Mann–Whitney U	z-value	p-value
Under 26 vs. 26–35	26556.500	-6.165	<0.001
Under 26 vs. 36–45	530.500	-2.039	0.041

Respondents aged under 26 were significantly less likely to be satisfied with the library resources and services (median = 3.66,  $n = 276$ ) than those aged 26–35 (median = 4.22,  $n = 276$ ,  $U = 26556.500$ ,  $P < 0.001$ ) and those aged 36–45 (median = 4.44,  $n = 7$ ,  $U = 530.500$ ,  $P < 0.05$ ). The results suggest that the two older age groups tend to be satisfied with the library resources and services compared to the younger one. As a result, the third hypothesis can be rejected.

**H4: There are differences in users’ familiarity with specific library services across the age groups**

**H0:** There is no significant difference across the different age groups in terms of familiarity with using specific library services.

**H1:** There is a significant difference across the different age groups in terms familiarity with using specific library services.

A Kruskal–Wallis test was conducted, and the results were statistically significant ( $X^2 = 63.94$ ,  $df = 2$ ,  $P < 0.001$ ) for users’ familiarity with specific library services (see Table 4.32 a and Table 4.32b in Appendix 11).

Post-hoc Mann–Whitney U testing also suggests a significant difference across the age groups concerning their familiarity with the library services. Table 4.14 shows the results.

**Table 4-14 Mann–Whitney U tests results for age groups against library services**

<b>Age groups</b>	<b>Mann–Whitney U</b>	<b>z-value</b>	<b>p-value</b>
Under 26 vs. 26–35	23955.000	-7.577	<0.001
Under 26 vs. 36–45	257.500	-3.326	0.001

Graduate students under 26 were significantly less likely to be familiar with specific library services (median = 3.50,  $n = 276$ ) than those aged 26–35 (median = 4.16,  $n = 276$ ,  $U = 23955.000$ ,  $P < 0.001$ ) or those aged 35–45 (median = 4.50,  $n = 7$ ,  $U = 257.500$ ,  $P < 0.05$ ). Notably, the results suggest that the two older age groups were more likely to be familiar with specific library services than those in the younger age bracket. Therefore, the fourth null hypothesis can be rejected.

**H5: There are differences in users’ perceptions about the role of the library across age groups**

**H0:** There is no significant difference across the different age groups regarding the perceived role of the library in supporting research.

**H1:** There is a significant difference across the different age groups regarding the perceived role of the library in supporting research.

A Kruskal–Wallis was conducted, the results of which were statistically significant ( $X^2 = 50.89$ ,  $df = 2$ ,  $P < 0.001$ ) for the perceived role of the library (see Table 4.24 a and Table 4.24 b in Appendix 11).

Post-hoc Mann–Whitney U testing shows a significant difference across the age groups under 26 and 26–35 regarding the perceived role of the library. Based on the test results, the 26–35 age group were more likely to state that their college library plays a significant role in supporting their research (median = 4.0,  $n = 276$ ) compared to the younger group (median = 3.25,  $n = 276$ ,  $U = 24959.000$ ,  $P < 0.001$ ). Based on the results of this test, the fifth null hypothesis can be rejected.

### 4.3.3 Testing the relationship between library visits and academic disciplines, gender, mode of study, age and academic year

Concerning the eighth research question, ‘Are the academic discipline, gender, mode of study, age and academic year related to physical library visits?’, five hypotheses were tested and validated. The hypotheses will test whether any relationship exists between the academic disciplines, academic year, mode of study, age and gender of the graduate students and their physical visiting of the library.

#### **H1: There is a relationship between library visits and academic year**

**H0:** There is no relationship between academic year and physical library visits.

**H1:** There is a relationship between academic year and physical library visits.

The relationship between academic year and physical library visits was investigated using Spearman’s correlation coefficient. Preliminary analyses were performed to ensure there was no violation of the assumptions of normality, linearity and homoscedasticity (variability in the score for the library visit variable should be similar at all values of the academic year variable). The correlation analysis established was significant but low ( $r = -0.117$ ,  $n=569$ ,  $P<0.005$ ). It was found that as the academic level of the students becomes higher, there is a lower incidence of physically visiting the library. This may be attributed to the reason for visiting the library—particularly during the first years of study—which may be for finding a quiet place to study or surf the Internet but not to actually conduct research. Based on the results of this test, the null hypothesis can be rejected, whilst the alternative hypothesis, which says there is a significant relationship between academic year and physical library visits, can be accepted.

#### **H2 There is a relationship between library visits and graduate students’ age**

**H0:** There is no relationship between age and physical library visits.

**H1:** There is a relationship between age and physical library visits.

A correlation analysis was used to examine the relationship between library visits and the age of the respondents. Spearman’s rho was again and resulted in a very low negative correlation, but it was not significant ( $r=-0.046$ ,  $n=559$ ,  $P=0.275$ ). Therefore, the null hypothesis that there is no relationship between the age of the students and physically visiting the library can be accepted.

### H3: There is a relationship between library visits and academic disciplines

**H0:** There is no relationship between academic discipline and physical library visits.

**H1:** There is a relationship between academic discipline and physical library visits.

Chi-square tests of independence were performed to determine whether a significant relationship exists between categorical variables with two or more categories and an ordinal variable (library visits). Table 4.15 shows the numbers and percentages of graduate students providing positive responses when questioned about physical library visits.

**Table 4-15 Results of the chi-square test for discipline against physical library visits**

Colleges	Regularly	Frequently	Occasionally	Rarely	Never	Of total%	X <sup>2</sup>	Sig
Engineering	20 (7.8%)	108 (42.0%)	74 (28.8%)	45 (17.5%)	10 (3.9%)	257 (44.5%)	68.531	<0.001
Science	6 (4.9%)	38 (30.9%)	59 (48.0%)	9 (7.3%)	11 (8.9%)	123 (21.3%)	68.531	<0.001
Arts	21 (20.4%)	24 (23.3%)	36 (35.0%)	15 (14.6%)	7 (6.8%)	103 (17.8%)	68.531	<0.001
Law	27 (28.4%)	35 (36.8%)	22 (23.2%)	7 (7.4%)	4 (4.2%)	95 (16.4%)	68.531	<0.001

The test shows a significant relationship between academic discipline and physical library visits ( $X^2 = 68.531$ ,  $df = 12$ ,  $P < 0.001$ ). The respondents from the College of Law were likely to visit the library more regularly when compared with those from the College of Arts, the College of Engineering or the College of Science. Those from the College of Science were most likely to occasionally or never visit the library, whilst graduate students from the College of Engineering were more likely to visit the library frequently or rarely compared to those from other colleges. Therefore, the null hypothesis can be rejected.

### H4: There is a relationship between library visits and the mode of study

**H0:** There is no relationship between the mode of study and physical library visits.

**H1:** There is a relationship between the mode of study and physical library visits.

Chi-square results reveal a significant relationship between the mode of study and physical library visits ( $X^2 = 19.461$ ,  $df = 4$ ,  $P < 0.05$ ). The results indicate that full-time students were more likely to visit the library regularly or frequently, whereas part-time students were more likely to occasionally, rarely or never visit the library. Table 4.16 shows the numbers and percentages of graduate students providing positive responses about physical library visits in relation to the mode of study.

**Table 4-16 Results of the chi-square results for the mode of study against library visits**

Mode of study	Regularly	Frequently	Occasionally	Rarely	Never	Of total%	X <sup>2</sup>	Sig
Full-time	29 (13.6%)	93 (34.5%)	68 (31.8%)	13 (6.1%)	11 (5.1%)	214 (37.0%)	19.461	0.001
Part-time	45 (12.4%)	112 (30.8%)	123 (33.8%)	63 (17.3%)	21 (5.8%)	364 (63.0%)	19.461	0.001

The results are understandable, as full-time students tend to spend more time at the college and have more opportunities to visit the library physically, while part-time students come to the college less often, as they have jobs and other responsibilities. Consequently, the null hypothesis can be rejected.

#### **H5: There is a relationship between library visits and the gender of graduate students**

**H0:** There is no relationship between gender and physical library visits.

**H1:** There is a relationship between gender and physical library visits.

Chi-square test results show a significant relationship between gender and physical library visits ( $X^2 = 14.077$ ,  $df = 4$ ,  $P < 0.05$ ). Table 4.17 shows the numbers and percentages relating to graduate students' gender and physical library visits.

**Table 4-17 Results of the chi-square test for gender against library visits**

Gender	Regularly	Frequently	Occasionally	Rarely	Never	Of total%	X <sup>2</sup>	Sig
Male	24 (9.1%)	96 (36.2%)	104 (39.2%)	30 (11.3%)	11 (4.2%)	265 (45.8%)	14.077	0.007
Female	50 (16.0%)	109 (34.8%)	87 (27.8%)	46 (14.7%)	21 (6.7%)	313 (54.2%)	14.077	0.007

The results suggest that females were more likely to visit the library regularly, rarely or never, whereas males were more likely to frequently and occasionally visit the library. The null hypothesis can therefore be rejected.

## **4.4 Summary of findings**

The main findings of this study can be summarised according to the themes that emerged from the study.

Regarding library provision, KU's Engineering Library, Science Library, Arts Library and Law library were able to meet the research needs of their graduate students. However, the Science



Library was more likely to provide its graduate students with reliable photocopying services and the required research materials than the Law Library. Science students were also more likely to rely heavily on ILL services to access research materials not found in the library compared to arts students. Younger graduate students (under 26) were less likely to believe that the college library plays a significant role in supporting their research than the older students (26–35 years old).

Regarding the types of materials the library provides, the results indicate that the college libraries provide graduate students with a variety of information resources, a wide range of databases and up-to-date books, along with efficient Internet service and sufficient computer facilities. However, audio-visual materials are not commonly provided. There were differences in terms of disciplinary needs. Younger graduate students (under 26) were less likely to consider that the library provides them with various information resources to support their research than older students (26–35 years old).

Regarding the value of the provided materials for the student's research, the results show that both print and e-resources are important to the graduate students when seeking to fulfil their research needs. However, there were disparities between the academic disciplines. For instance, students from the College of Arts were more likely to prefer print documents compared to students in the other disciplines, whilst engineering graduate students were the least likely to prefer print documents.

It was found that the graduate students from the four disciplines were satisfied with the library hours, library instructions, number of library staff and qualifications of the (reference and subject) librarians, along with the research materials and the availability of books on the shelves. However, there were differences between the colleges. In addition, the older age group (26–35 and 35–45) tend to be more satisfied with the library resources and services than the younger age group (under 26 years old). Most of the graduate students were familiar with specific library services, such as the online catalogue, e-journals, e-books and the information desk, along with DD and bibliographic databases. However, there were differences based on academic discipline. In addition, older graduate students (26–35 and 35–45 years old) tend to be more familiar with the use of specific library services than younger ones (under 26 years old).

Regarding the roles potentially played by the library in guiding and supporting the graduate students in their research, the results show that the college library plays a role by providing

information literacy workshops, a supportive website and having librarians available when needed; however, publicising the library services does not occur frequently. There were college-based differences: students from the College of Law are the least likely to perceive that their college library plays a significant role in assisting them to conduct their research, while those from the College of Science are more likely to perceive that their college library provides them with information literacy workshops and a supportive website and publicises their services. On the other hand, the arts graduate students were the most likely to feel that their college library provides them with librarians whenever needed. Notably, however, it seems there is a lack in publicising the services available—particularly for graduate students’ research—even though science graduate students are the most likely to feel their college library publicises the services for them. Graduate students aged 26–35 are more likely to perceive that the library plays a significant role in supporting their research than younger ones.

Finally, a relationship was found between physical library visits and the different academic disciplines. Those from the law discipline, for example, are more likely to visit the library regularly, whilst those from in engineering are more likely to either frequently or rarely visit the library. However, science graduate students are more likely to never or occasionally visit the library than those from the other colleges. It was also established that female graduate students are more likely to regularly visit the library, whilst males are less likely to do so. Full-time graduate students are more likely to visit the library regularly and frequently, whilst part-time students are more likely to occasionally, rarely or never visit the library. In addition, a significant relationship was found between library visits and the level of academic study. The frequency of library visits decreases in line with the increase in the level of study of the graduate students.

#### **4.5 Open questions - data analysis**

Qualitative data were derived from the answers to the open questions of the questionnaire (Question 32 and Question 33, Section 3) to investigate what causes graduate students to be dissatisfied with the university library services and whether they have any suggestions for improving these services in the future. However, Question 31 was dropped from the analysis because the collected data provided misinformation; therefore, the question was asked later in the second phase of the study when interviewing the participants. Of the 578 participants, only 136 responded to the open questions. Table 4.18 shows the number of respondents by college.

**Table 4-18 The number of respondents in respect of college**

<b>The open questions</b>	<b>Law</b>	<b>Arts</b>	<b>Science</b>	<b>Engineering</b>	<b>Total</b>	<b>Overall total participants</b>
<i>32. What makes you dissatisfied with the university library services?</i>	41	30	17	43	131	578
<i>33. Do you have any suggestions for improving the university library services in the future?</i>	45	35	16	35	131	578

### **4.5.1 Data analysis procedure**

The data collected from the open questions were translated into English and subsequently analysed qualitatively using thematic content analysis. This approach can be defined as a descriptive presentation of qualitative data (Anderson, 2007). Using this approach is appropriate for the case study research design, as Creswell (2014, p.196) indicates when stating that ‘Case study ... involves a detailed description of the setting or individuals, followed by analysis of the data for themes or issues’. The researcher followed the procedure for the thematic content analysis in an attempt to analyse the qualitative data. Initially, the responses were examined and a preliminary set of themes was created. Subsequently, the responses were re-examined and coded according to the preliminary themes, with additional themes added when necessary. NVivo 8.0 software was utilised to facilitate the process of organising, managing and coding the qualitative data. The main reason for using this programme is because computers are efficient tools for storing and locating qualitative data (Creswell, 2014). Consideration of the respondents’ comments and perceptions about the library services was included in the analysis. The results of the qualitative analysis are presented using direct quotes from the participants’ responses.

The following are the major themes that emerged from the analysed data.

- The adequacy of the library information resources to meet graduate students’ needs
- The enhancement of the library services to fulfil graduate students’ needs
- The role of the library and librarians in supporting graduate students’ research
- Setting up the physical library environment to meet graduate students’ needs

These issues will be discussed in more detail in the following sections.

## 4.5.2 Library information resources

Throughout this theme, the focus is on the development of the library's collections to meet graduate students' research needs. The results indicate that some of the students from different disciplines were dissatisfied with the number of books, copies, editions, organisation and availability, as well as with the reference books. They reflect the need for sufficient, recent, diverse information resources to meet their needs. Moreover, they claim that further collaboration is needed between the libraries and faculty members to provide them with the fundamental resources required for studying.

## 4.5.3 Book collections

A lack of books, including reference books, was found to be an issue. Ten of the students from the College of Law indicated that they need more reference books relating to their area of interest. For example, one of the students commented: *'The reference books in our subject area are not enough, and that's what makes us order photocopies of most of the reference books we need from Egypt'*. (L1)

Seven participants from the same college suggested the provision of sufficient reference books in their subject area to fulfil their research needs, while four students from different groups stressed the need to foster collaboration between the academic staff and the library to develop the book collections in their research field. One of the students stated that: *'The library staff should cooperate with the faculty members to provide them with the titles of the reference books necessary for our subject area'*. (L61)

The lack of print books in their area of interest was also highlighted as an issue, causing graduate students to be dissatisfied. Of the 578 participants, 25 reported that a lack of books on certain research topics—particularly up-to-date books—caused them to be dissatisfied. One of the students from the College of Arts noted that: *'The books in our area of interest are not enough or up-to-date'*. (A230)

Twenty students from the four disciplines also suggested that they should be provided with enough books specific to their research field—particularly up-to-date books. One student from the College of Arts commented: *'We need books! Recent sources! We have to order everything online, and it is very expensive because of the cost and time.'* (A232) A student from the College of Law noted: *'The available resources cover legal issues in general and are not specific to our field'*. (L41)

Some of the graduate students were concerned about the editions of the books. One participant from the College of Arts stated: *'We need new editions of books, editions from 2008; I am talking about the MA programme in Comparative Literature.'* (A238) Consequently, two participants out of the overall total suggested that new editions of the books should be added to the library. One of them noted: *'Provide us with recent editions of the books in our field.'* (L13)

A number of graduate students from the various disciplines expressed their dissatisfaction with the lack of availability of the required books. One student from the College of Arts indicated that: *'The recent or even old books that are essential in my subject area are unavailable in the library, and that is what makes me buy the books I need online from Amazon.'* (A236) Another participant commented that: *'Some of the arts books specified for our subject area are not available in the Arts Library but are available in other libraries, such as Engineering or Islamic studies.'* (A239)

Two students from the four groups stressed enhancing the library's cooperation with other libraries to acquire the resources they need in their area of interest. One student from the College of Arts also suggested that what is required is *'more collaboration with other university libraries to facilitate the process of acquiring the resources needed in our research field.'* (A231)

The organisation of the books was another issue causing some graduate students to feel dissatisfied. Three graduate students from the College of Law explained that the poor organisation of the books on the shelves made it much more difficult for them to locate. One of the students commented that *'Although the books are available in the library, we face some difficulty in locating them on the shelves.'* (L34)

Another student from the same college was concerned about the number of copies of books in the library and noted that *'The available books in the library do not cover my area of interest and most of them are the last copy.'* (L67) Three graduate students from different disciplines suggested adding more copies of the books already available in the library to meet their needs. One participant from the engineering group stated that *'There must be additional copies of books (3–4) so that the students can get the book they need in case it has been borrowed by others.'* (E441)

One graduate student expressed his dissatisfaction with the amount of e-books provided in his research field. He commented that *'The number of computers and e-books is not enough.'*

(E411) Similarly, another participant from the College of Law suggested *'The library should provide us with more electronic books in our field.'* (L62)

#### 4.5.4 Other information resources

Regarding the different information resources, a student from the College of Science was dissatisfied with the journal issues available in the library. He commented that *'In terms of scientific journals, some of the journal issues are unavailable and some are missing.'* (S115)

Three students from various groups suggested increasing the number of subscriptions to cover more journals in their research field. One of them stated that *'The library should subscribe to more journals' databases so that we can access recent issues of the journals that are useful for our area of interest.'* (S115)

Providing recent copies of theses and dissertations is another issue that emerged. One of the students from the College of Law stated that *'The library should provide us with recent information resources, particularly Master's dissertations and PhD theses.'* (L39)

Another student suggested providing information resources in different languages, stating that *'There must be a variety of information resources provided in different languages (Arabic, English, and French).'* (L15)

The provision of past exam papers for graduate students is another issue that emerged. One student from the College of Arts noted that he is dissatisfied with *'the unavailability of copies for the previous exams in the library.'* He suggested that *'The library should supply us with copies of past exam papers.'* (A233)

Regarding the format of information resources, one of the students from the College of Engineering stated that *'Hopefully, the library can supply us with some information resources in the form of hard copy or .pdf files.'* (E436)

Some of the graduate students perceived the amount of library resources provided to meet their research needs as inadequate. Most of the resources that graduate students are dissatisfied with are print resources, particularly in the law and arts disciplines. This might be because such disciplines rely heavily on print materials, with only a select few of the necessary information resources available digitally.

#### 4.5.5 Library information services

Extending the library opening hours and providing efficient photocopying services is the main focus of the second theme. Within this theme, some of the graduate students perceived that the library services provided were insufficient to fulfil their research needs. From their own perspective, some services need to be improved, such as the circulation system, online services, accessibility of databases and Internet services. They also perceived the need for supplementary services to support their research and advocated relying on the experiences of professionals in librarianship to improve the library services.

Of the overall total, 15 graduate students showed a negative attitude towards the library services in general, further highlighting that the library services provided are inadequate to fulfil their research needs and that they must be improved. For example, one of the students from the College of Law commented *‘I feel that the library services are not well developed enough to cope with the evolving information technologies.’ (L8)*

Another student stated that *‘I think that the library does not provide the students with the required services they need.’ (L66)*

The participants from the various disciplines provided their suggestions for improving the library services. Three students from the four groups recommended capitalising on the experiences of library professionals to improve the services. For example, one of the students noted *‘They should draw on the experience of professionals in the field of librarianship to improve the library services.’ (L6)*

#### 4.5.6 Photocopying services

Regarding the photocopying services provided, 10 out of the 578 students reported that these are insufficient to fulfil their research needs because they are not available all the time. For example, one of the students from the College of Arts stated:

*‘The photocopying services are not available all day long, and if we want to use them, we have to pay for the paper. Students discover this issue later because we are not acquainted with that, and also there is no ki-net [payment machine] to make the payment.’ (A260)*

Eleven graduate students from the four colleges stressed the need to extend the photocopying services. One student from the College of Law commented *'In terms of photocopying services, I hope that they can be available till 9 pm.'* (L7)

#### 4.5.7 Library hours

Twelve respondents from the four groups were dissatisfied with the length of the library's opening hours, considering them inadequate to fulfil their research needs. One respondent from the engineering group commented that:

*'The library hours are not enough. The library does not open all day long and is closed at the weekends. As for me, I am a part-time Master's student. I have a job in the morning and I have to attend lectures in the evening, so I have no time to visit the library, since it closes at 9pm, and when I am free at the weekends, the library is closed, and this prevents me from using the library for my research work.'* (E412)

The participants from the four colleges suggested extending the library's opening hours to meet their research needs. Thirteen of the students commented that the library should open later in the evening and at weekends. For example, a student from the College of Law stated *'There should be an increase in the library hours so that the library can be open till midnight.'* (L44) Another student noted that they should *'open the library on weekends.'* (A211) It is also worth noting that most of the participants were part-time students working in the daytime and can only attend the library in the evening.

#### 4.5.8 Other services

Two students from the four colleges reported their dissatisfaction with the electronic services provided by the library. One student from the College of Arts noted that what made him dissatisfied was the fact that the specific databases for his discipline are not easy to access. He noted that *'The MLA (Modern Language Association) databases cannot be accessed all the time.'* To improve this service, he suggested that *'It would be nice if we were provided with easier and 24/7 access to the MLA databases.'* (A270) Another student from the College of Law stated that *'The online services in our library are restricted to the online catalogue.'* (L30)

Some students from the four colleges suggested extending the online services and providing remote access. One participant stated *'The library online services should be improved by providing graduate students with personal passwords and usernames that enable them to access the library's website remotely from home.'* (E412)



Another four students stressed the need to upgrade the Internet services and increase the speed of the network. One of them stated that *'We look forward to the library providing us with wireless internet services inside the library.'* (S153)

Two students from the College of Arts stated that they need more specialised services, such as translation services. One of them commented that what made him dissatisfied with the library services was the *'unavailability of translation services for foreign books that can facilitate our research'*. (A235) Another student noted that *'It would be nice if the library provided us with translation services for foreign books.'* (A237)

A respondent from the law group noted that he was dissatisfied with the loan system used by the library. It is a traditional system, and he hoped that it would be replaced by an electronic one. He commented that *'The library is still adopting a traditional loan system and using cards for borrowing books'*. (L32) Two students suggested using a newly developed circulation system and increasing the number of items that can be borrowed. One of them stated that *'The library should apply an electronic loan system and allow graduate students to borrow more than 15 books.'* (L32)

One graduate student from the law group noted that what made him dissatisfied was *'the lack of library instruction on how to use the online databases'*, (L39) whilst one participant from the College of Engineering stated *'We need more library instructions to facilitate the searching process of information resources.'* (E465) Another student stated that *'The library should establish virtual tutorials on the use of the online services provided for graduate students through its website.'* (L34)

Only one of the participants from the College of Arts noted that what made him dissatisfied with the library services was that there was no space inside the library for eating snacks. He commented on *'the lack of coffee shops in the library for some snacks.'* (A68) A further five students suggested that cafés could be provided in the library. One of them stated that *'There must be a café or snack shop inside the library.'* (L52)

From the comments above, it seems that some graduate students perceived the services offered by the library as being inadequate in terms of fulfilling their research needs. They consider that some of the library services need extending, whilst others need to be improved. They reflect the need for more services to meet their research needs.

### 4.5.9 The role of the library and the librarians

In the third theme, the presence and skills of the librarians was the core concept. The focus of this theme is on the role of the library staff in marketing their services to graduate students. A lack of awareness surrounding the available services in the library was indicated by some of the graduate students. Comprehensive publicity concerning what is available in the library is a significant issue that should be taken into account. The need for training on how to search for information resources efficiently was also highlighted.

#### 4.5.10 Library staff

Graduate students from different colleges are dissatisfied with the level of staff available and the qualifications of the reference librarians. Seventeen of the graduate students indicated that there are too few library staff members and that their presence is not obvious. Their view of the reference librarians is that they lack adequate qualifications. Some also stress the need for more communication between the library staff and the students. One of the students from the College of Law commented that *'The library staff are not helpful in guiding the students to find the books they need on the shelves.'* (L4)

Another student from the College of Engineering noted that *'The library staff are unfriendly.'* (E431) Some students also think that the reference librarians are unaware of their key tasks and that they lack experience. One of the students commented that *'The reference librarians are not qualified enough to deal with the graduate students' research needs.'* (L4) One student from the College of Law was dissatisfied with the availability of reference librarians in the library. He noted that *'The reference librarians are not available when we need them.'* (L34)

Nine students from different groups suggested increasing the number of library staff so that they can provide assistance for the students when needed. One of the participants stated that *'They should increase the level of the staff around to help the students whenever they need them.'* (E420)

Another eight students from different colleges stressed the need to hire qualified librarians who are knowledgeable and also friendly and helpful. One of the students commented that *'The library should provide us with librarians who are aware of our research needs.'* (L60) They also maintained that the reference librarians are not qualified enough to provide assistance in their research field. One student from the College of Law suggested providing the library staff with training sessions about how to communicate with the students and be aware of their

research needs. He stated that *'The library staff needs to be trained on how to communicate with the graduate students by providing them with communication skills sessions that focus on how they can meet their needs.'* (L12)

Another student from the College of Arts suggested staffing the library with more subject librarians who understand the requirements of their research field, stating that *'There must be an increase in the number of information specialists in the library who know about our research needs.'* (L3)

Some students harboured a negative attitude towards library staff, especially reference librarians. They maintained that the library staff lack adequate qualifications and are unacquainted with the research needs of graduate students. They also suggested that there is a need to recruit qualified librarians who are both friendly and helpful and that the number of information specialists knowledgeable about their subject area should be increased.

#### **4.5.11 Publicity**

Five graduate students confirmed that they had a lack of awareness of the library services available to them. Two students from the College of Arts stated that they were unacquainted with what the library offers. One student commented:

*'I have no idea whether or not information literacy workshops are offered by the library to graduate students. I have never seen any announcement about that.'*  
(A236)

Another commented:

*'It is supposed that there is announcement about what services are available in one of the university publications, such as "Afaq" [students' union magazine], or a poster inside the college; for example, the library announces that it has an e-journal service...so that the students become aware about that. Our concept of the library is that it's a quiet place for studying; we have no idea about the available services for graduate students in the library.'* (E390)

One student from the sciences group showed a lack of knowledge concerning the specific services, such as the OPAC. He admitted that, *'There is no catalogue or maybe I do not know how to use it, or maybe it can be used through the computer.'* (S113)

Three students from different groups also stressed the need to publicise the services offered by the library. One stated that *'The library should provide us with more information about the available services on the library website.'* (L100)

The comments above indicate that some graduate students are unaware of the services offered to them by the library. Some suggested that there should be more advertisements concerning which services are available in the library. One participant from the College of Science suggested providing information literacy workshops to enhance graduate students' awareness of which information resources are available and workshops about how to choose the most appropriate resources to meet their research needs. He stated that *'The library should offer information literacy workshops for graduate students.'* (S106)

#### **4.5.12 Training and support**

A student from the law group expressed his dissatisfaction with the role of the library in training them in terms of how to use the online library services to search for information resources. He mentioned that *'There are not enough (information skills) training sessions for graduate students.'* (L62) Three students suggested they should be provided with training sessions on how to use the library's online services. One stated that *'The library should offer (information skills) training sessions for graduate students.'* (S113)

#### **4.5.13 Library environment**

The focus of the fourth and last theme is the library's physical environment—mainly the provision of information communication technology (ICT). There was some dissatisfaction among the participants regarding various aspects of the library environment, such as its organisation, noise level, lighting, space, location, study rooms and peripheral devices. Being uncomfortable with those aspects might be a barrier inhibiting graduate students from visiting the library.

Graduate students from different disciplines reported their dissatisfaction with the physical environment of their college library. From their point of view, there is not enough quiet, cleanliness and organisation within the library. Seven of the students indicated that the noise made by other students in the library made them dissatisfied. One of the students from the College of Engineering commented that *'The noise that comes from other students who are talking and failing to respect their peers.'* (E444) Four students suggested that more

consideration should be paid by staff to the quiet needed within the library to meet their academic needs. One arts student made the following statement:

*'More attention to quietness in the library [is necessary]; the staff should alert the students about the noise that comes from them. I feel that the library is very noisy. I cannot concentrate when I am studying.'* (A236)

This indicated that some of the graduate students were not happy about the noise level inside the library, reflecting the need for a quiet environment to enable them to study without any distractions.

The tidiness of the library was another issue that emerged, as 14 graduate students expressed their dissatisfaction with it. They reported that their college library suffered from a lack of organisation and cleanliness. One student from the College of Engineering stated that *'The library services are not well developed and there is a lack of cleanliness and organisation inside the library.'* (E439) Eight students from different colleges suggested that additional attention should be paid to the organisation and cleanliness of the library. One student from the College of Arts recommended that there be *'more consideration to the organisation of the library from the side of the university libraries' administration.'* (A217) Another student from the College of Law stated that *'They should improve the appearance and cleanliness of the [Law] library.'* (L34)

Some students reported their dissatisfaction with the library as a place. From their point of view, the library space is inadequate to fulfil their research needs. It was stated that there are insufficient study rooms and that they need to be restructured. Ten of the students from the four groups indicated that the library space was insufficient and that the building needed to be renovated. A student from the College of Law commented that *'The library building is too old and the study space is not enough to accommodate the large number of law student attendees.'* (L9)

Another student from the same college indicated that there was no specified area for research work inside the library. He stated that *'There is a lack of space for research in our college library.'* (L63)

A number of students were in favour of increasing the library space. One student from the College of Arts stated that *'There must be further expansion made in the space of the Arts library in terms of study space, reading space and, also, the spaces between the shelves.'* (A249)

They thought that the library building needed to be refurbished. A student from the College of Law stated that *'They should renovate the library building, increase the space of the library, and leave more space between the shelves.'* (L9) Another student suggested relocating the library: *'The library building should be transferred to a better location.'* (L66)

Seven students from four colleges were dissatisfied with the design and number of study rooms in the library. One student from the law group noted that *'There are not enough study rooms especially designed for graduate students,'* (L7) whilst another student from the College of Arts commented that *'The study rooms are not out of the way of noise.'* (A70)

Nine of the respondents suggested increasing the number of study rooms and providing group discussion rooms. They also suggested redesigning the available study rooms to be away from noise. One participant from the College of Law said *'We need separate study rooms especially designed for research purposes, the same as those in Jaber Al-Ahmed Central Library.'* (L7)

Another student from the same college commented that the college should *'provide us with group discussion rooms. I think that Jaber Al-Ahmed Central Library is a good model for the ideal library building design.'* (L9)

Two graduate students expressed their dissatisfaction with the overall quality and quantity of chairs and carrels in the library. One student from the College of Law said *'There are not enough chairs and carrels in the library'* (L7), whilst three graduate students suggested improving the quality of the seats and increasing the number of carrels to meet their research needs. One student from the College of Arts commented that *'The library should provide us with adjustable chairs.'* (A72)

One student from the College of Engineering expressed dissatisfaction with the lighting inside the library, noting that *'The illumination in the library is very poor.'* (E459)

Another graduate student expressed his dissatisfaction with the toilet facilities in the library, stating that there needs to be *'more attention to the library facilities maintenance, particularly the toilet'*. (E444) This was also mentioned by another student.

The comments above show that some of the graduate students were uncomfortable with the physical environment of the library, holding the view that the library should provide them with a greater level of peace and quiet to meet their research needs. The students also stressed the

need for well-designed study rooms—particularly in the College of Arts and the College of Law.

#### 4.5.14 The provision of ICT

The provision of ICT is another issue relating to the library's physical environment that emerged. Thirteen of the graduate students were dissatisfied with the number of computers as information resources in the library. They reported that in addition to being old and slow, the computers are out of order most of the time. One of the students from the College of Arts stated that *'Most of the time, the computers in our library are not working.'* (A241) Nineteen students from the four groups stressed the need to provide them with more and newer computers. For example, a student from the College of Arts said *'There must be an increase in the number of computers in the Arts Library and they should maintain them frequently.'* (A249)

Four graduate students expressed their dissatisfaction with the number of peripheral devices available in the library, such as printers. They thought that they were inadequate to fulfil their research needs. One of the students from the College of Law said *'The number of printers in the library is not enough.'* (L3)

A student from the College of Engineering suggested providing paper for the printers. He commented that *'The library should supply us with paper for the printers. Sometimes, I use the printer for printing out my research work, and then I discover that there is no paper in the printer.'* (E390)

Two students suggested improving the application of IT and providing the library with new devices. One of them stated that *'They should enhance the use of information and communication technologies in the library.'* (E411)

The comments above reveal that some of the graduate students complained about the lack of computers in the library and about problems with printers, such as the inadequate number of machines and the shortage of paper. Some students noted that they had to bring their own printer paper. Importantly, it seems that the students were unaware that they were eligible for touch keys with printing credits. This indicates a lack of knowledge on the part of the graduate students regarding what is being offered by the library.

It is important to note that some of the graduate students stated they were completely satisfied with the library services and had nothing to add. Some of them simply answered 'I don't know', and others stated they had no suggestions to improve the university library services in the future.

This section was created as a follow-up for Part Three of the questionnaire, which investigated user satisfaction with library resources and services. The students were given the opportunity to express their attitudes about the library services in detail and offer their suggestions for improving its services to meet their needs. Different issues relating to the students' dissatisfaction with the library resources and services emerged. One of the major issues related to the library collection, such as the lack of adequate books in terms of currency, specificity and variety. Other issues were the library hours and photocopying services. However, some issues related to the role of librarians, such as the lack of publicity about library services, the lack of training sessions, the lack of qualified librarians and the availability of librarians. Dissatisfaction with the library's physical environment, mainly in terms of the provision of ICT, was another major issue.



## CHAPTER 5 – ENGINEERING DISCIPLINE/THE ELECTRICAL ENGINEERING FIELD

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### 5.1 Introduction

This chapter presents the findings of 12 interviews conducted with electrical engineering graduate students studying at KU. Qualitative data were collected using in-depth semi-structured interviews. The interviews aimed to:

- Understand the role of KU libraries in supporting graduate students' research;
- Identify the factors influencing the role of the library from the perspective of the students in relation to their use of information throughout the research process; and
- Explore the cultural characteristics of the discipline and how they shape the information use and behaviour of the graduate students.

The interview questions were developed to investigate the students' perceptions regarding their use of the library and information resources throughout the research process. The data gathered from the participants were coded and analysed using NVivo 10.0, as described in Chapter 3 (Section 3.11.2.2). The results of the qualitative analysis are presented using direct quotations from the participants' responses.

This chapter begins by presenting the characteristics of the interviewee sample (Section 5.2), followed by a discussion of the analysis of the cultural characteristics of the discipline at each stage of research (Section 5.3). Each cultural aspect is discussed separately, as follows: the nature of the discipline (Section 5.3.1), information needs (Section 5.3.2), study mode (Section 5.3.3), students' personal experiences (Section 5.3.4), library information services (Section 5.3.5), external information sources (Section 5.3.6) and financial adequacy (Section 5.3.7). Next, the emergent issues related to the electrical engineering discipline are presented (Section 5.4). The disciplinary shaping of the information use and behaviour of graduate students is then discussed (Section 5.5), followed by a discussion of the key characteristics of the discipline (Section 5.6). The chapter concludes with a summary of the students' perceptions of the college library's role in supporting their research (Section 5.7).

### 5.2 Characteristics of the interviewee sample

The participants were 12 students from the EED at KU (the College of Engineering and Petroleum). Nine of the participants are female, of whom eight were part-time students and one was full-time. The other three participants are males, of whom two were part-time students and

one was full-time. Three of the participants in the sample were interested in the thesis option, whilst the remainder were carrying out a non-thesis project (see Table 5.1).

**Table 5-1 Number of participants in respect to their characteristics**

Participants' characteristics	Females	Males	Total	Overall total participants
Thesis option	2	1	3	12
Non-thesis option	7	2	9	
Part-time	8	2	10	12
Full-time	1	1	2	
Females	9	0	9	12
Males	0	3	3	

Candidates for the interviews were selected intentionally from three different groups in terms of the stages of their research: the first group encompassed students who had completed their proposal and were ready to start their actual research; the second group encompassed students who had already embarked on their actual research and were in the process of writing up their thesis or non-thesis project and the third group encompassed students who had submitted their research work. Consequently, the findings are divided as follows:

- Stage 1: proposal development stage;
- Stage 2: the mid stage—collecting and analysing data, presenting the results and writing-up;
- Stage 3: reflections on the students' experiences throughout their research process.

Therefore, an equal number of participants were included for each of the above stages:

- Four students in the proposal development stage;
- Four students in the data collection, data analysis and writing-up stages;
- Four students in the reflection on experience stage, which involved students who have submitted their research work successfully.

It should be noted that interviewing electrical engineering students was a frustrating and puzzling experience, as most of them work for companies and therefore are busy and have little time to be interviewed. This made finding the required sample of electrical engineering

interviewees difficult. In addition, the researcher was unable to obtain the same richness and depth of detail from these students compared to the students in the other disciplines. This may affect the findings of this case study. This is discussed in Section 11.5.4 of Chapter 11, which deals with data collection limitations.

### **5.3 Analysis of the cultural characteristics of the discipline at each stage of the students' research**

The cultural characteristics of an academic discipline emerge from its intellectual and social structure, and each discipline has specific cultural characteristics (Fry, 2003). In this study, the cultural characteristics of the discipline were revealed through the social and intellectual interaction of the graduate students with the library environment throughout their research process. The aim of this study is to investigate the role of the library and how it has been influenced by the research process and the factors that influence the effectiveness of the role. The findings of this study suggest that cultural elements influence the use of the library by the graduate students in their research activity. This section presents the cultural characteristics of the discipline in each research stage, supported by evidence from the collected data.

#### **5.3.1 The nature of the discipline**

This section discusses two aspects that are affected by the nature of the discipline, topic selection and the nature of the topic (that involves design process). The relationship between these two aspects and the use of the library and its information resources throughout the research stages is discussed in Sections 5.3.1.1 and 5.3.1.2.

##### **5.3.1.1 Topic selection**

To graduate with Master's degrees, engineering students are expected to successfully complete either a thesis or non-thesis project. Thesis students are expected to carry out more textual and research work than non-thesis students, who are expected to undertake more practical courses. Each student is expected to select a research topic that his/her supervisor must approve. All students must develop a proposal and submit it to the CGS Committee for approval. This element of cultural identity will be discussed as it relates to each stage of the students' research, as follows.

## Stage 1: Proposal development stage

The examined data reveal that both thesis and non-thesis students used three different methods to select their topics, as follows.

- **Module-based selection.** Students who adopted this method tended to base their selections on their personal knowledge about the topics, which they gained during the master's programme by completing mini-projects to fulfil the requirements of the academic modules. Students who adopted this method chose topics because they were familiar with them and were confident regarding the follow-up research processes. One non-thesis student who chose this method said:

*'I attended a module called non-linear control, as my specialisation is control ... We were asked to carry out a mini-project and create a controller design, and each one of us was required to select a specific model. I personally selected a model about cancer, designed many controllers and applied the required simulation'. (EED1)*

A student in the final stage stated that she chose her topic because it was covered in the course module. She stated:

*'Well, I knew my topic already. Before ... I agreed on the topic with the supervisor before registering for the dissertation, I discussed it with my supervisor ... For example, in my case, my supervisor supplied me with a rich paper and asked me to read it carefully'. (EED10)*

She added:

*'After I read and understand the paper I should complete a simulation... I do not think I needed to visit the library at this stage because to me it was not the workstation place which I needed to complete my simulation'. (EED10)*

This student's experience showed that although the supervisor did not suggest the topic, he/she helped the student make the decision by supplying her with the required information resources. The student did not need to visit the library or use the library's services when she made her decision about the topic because the supervisor had met her information needs. What she needed after that is to verify the idea of the topic, check its validity for application, and complete her proposal.

- **Supervisor-based selection:** Students who chose this method relied heavily on their academic tutors to make the decisions on their behalves. One thesis student confirmed:

*‘I personally did not suggest any ideas; it was all suggested by my supervisor ... Most students prefer to use their supervisors’ suggestions’. (EED3)*

The same student stated that the feeling of trust in the knowledge of the supervisors makes students value their supervisors’ choices. She stated that:

*‘[...] a supervisor has sufficient knowledge about the selected topic, which reduces the possibility of conflict’. (EED3)*

Supervisors are not the only professionals who can make decisions about the studied topics. Students can select other academic staff, such as module co-ordinators, to act as supervisors. Such people can be trusted to make decisions because they are able to assess the students’ interests and abilities and select topics that match their capabilities. One thesis student reported:

*‘I spoke to the module co-ordinator. He chose a topic for me which matched my interests as well as my capability. At the beginning, he supplied me with an academic paper to help me create a background and introduce me to the topic’. (EED2)*

Students mentioned the same factors that appeared in the first stage (proposal development stage) in the final stage.

The topics were selected based on a list provided by the supervisor. One non-thesis student described her experience as follows:

*‘At the beginning of the project, my supervisor supplied me with more than one academic paper, which he extracted online. Each of these papers presented a different topic, and I was expected to select one of the suggested topics after I finished reading the papers ... I selected a topic and agreed with my supervisor on it, but after we started the project, I did not feel very confident, and we faced a block in the result, so I decided to change the topic. Again, I went back to select another topic. I can tell you that my supervisor assisted me, and he was the main channel supplying me with the information resources I requested’. (EED12)*

From the above experience, a few issues related to topic selection can be identified:

1. The supervisor recommended a set of topics and supplied related information resources to help the student make the decision.
  2. The student followed the expected process, but the decision was not the right one, as the student needed to select a new topic.
  3. The student selected a topic without any need to interact with the library because the supervisor met her information needs.
- **Multiple methods selection:** According to this method, a student selects the topic after he/she is introduced to it in one of the modules. The student finalises the topic after searching for information and reading about it. One non-thesis student stated:

*'I had to do more reading. I knew a few steps from the module and from the practice, but when I reached the simulation for the project's purpose, I had to search for more papers and the software itself.'* (EED4)

In all, the students adopted three different methods of topic selection. Both thesis and non-thesis project students can select their topics based on their interactions with the topics during course modules, based on their academic staff or supervisors' recommendations or based on multiple experiences with the topics, including reading and searching.

### **Stage 2: Mid-stage (data collection, data analysis and writing up)**

As the decision about the topic has already been made, the library had no role relating to topic selection in this stage.

### **Stage 3: Reflection on students' experiences**

From the students' experiences, a set of reasoning identified influences the topic selection and shapes the demand for library resources and services, which in turn helps determine the library's supporting role.

- **Less use of library services and information resources:** Students are familiar with the topics, as they built their background knowledge during their previous interactions with the topics in one of the academic course modules. One non-thesis student stated:

*'I based the creation of the design on my previous knowledge, which I gained from the module I mentioned earlier. Also I knew which software I should use to complete the simulation.'* (EED4)

- Less use of the library services and information resources: Students depend on their supervisors to supply them with the information resources required. As one student commented:

*'I did not go to the library; my supervisor provided great support and he had an answer and information for every matter. We did not reach the stage that we needed to go to the library and search for information. To be honest, in our department, this is what is happening... Most of the students depend on their supervisors to supply them with the materials'. (EED3)*

- More use of library services and information resources: This occurs when students need to do background reading and search for relevant information resources. As one student reported:

*'Yes, it was useful [university library services], I was able to access them ... I asked my supervisor to supply me with a book about issue X, and he did. I told him I want to understand issue Z, and he directed me to someone else's thesis. I read only two theses, but I mainly read papers because my topic is fairly new, and most of the discussions about it are published in papers'. (EED3)*

In the area of topic selection, students need to gain background knowledge about topics before they decide which topics to choose for their research. As supervisors often suggest topics, they typically provide the information resources. Even if the supervisor did not suggest a topic, he/she will often supply the required information resources to meet the students' needs. Three topic-selection methods that influence topic selection have been identified: module-based selection, multiple method selection and supervisor-based selection. The one the interviewees in this case study most commonly chose was supervisor-based selection. The more dependent the students are on their supervisors as an information sources, the less dependent they will be on the library services.

### **5.3.1.2 The nature of the topic**

It has been argued in Chapter 3, Section 3.9.2 that each area of specialism has its own characteristics and needs that shape the students' interaction with the information resources and the library. According to the accounts provided by the informants in this case study, the nature of the topic is influenced by the nature of the design process, which in turn influences

the types of information sources to be used. The two issues— the nature of the design process and information sources—will be discussed as they relate to the research stages.

### Stage 1: Proposal development stage

Engineering Master's students in general and electrical engineering students in particular are expected to provide a new solution to a practical problem in the field. Therefore, they have to identify a topic that enables them to creatively apply scientific principles and design or develop a device or manufacture a process as the final product. Accordingly, they choose a current and original topic as the focus of either their thesis or non-thesis project.

- **The nature of the design process:** Both thesis and non-thesis students are required to adopt a problem solving topic that involves carrying out an initial simulation to check the validity of the topic for application prior to making a decision regarding research. A non-thesis student commented:

*'The aim of searching for information in this stage is to find the model which I can use to complete my design. I need to check the models which have been used before and check the results which have been gained. I need to check the creditability of each model and to what extent the results which will emerge after using the model will be accurate'. (EED1)*

- **Information sources and resources used:** Students tend to seek information sources and resources that are readily available to meet their information needs. It was found that all students tend to use:

**1. Their supervisor:** For most of the students (EED2, EED3, EED4), the demand was made on the supervisor, who is recognised as being the first and main source of information. One student stated:

*'My supervisor at the beginning provided me with a file, which had a large amount of relevant papers to my topic. This was very useful as I was able to use the papers and gain information.'* (EED4)

Following is an excerpt from a conversation between the researcher and a part-time thesis student:



*'Researcher: Did you search for papers or did your supervisor supply you with them?'*

*Interviewee: No he supplied me with them. Usually, the supervisor provides the students with the papers in the early stages to be involved with the topic, but they can also search for themselves.'* (EED3)

**2. E-resources:** Most of the students in this discipline confirmed that they used library e-resources more than the print ones:

- **E-journals and e-books:** Students in this stage tend to use e-journals and e-books more than print ones. All the students interviewed in this stage confirmed that they used e-journals more than any other resource.

One student commented:

*'I carried out my search in the library; I used the library's computer to access Science Direct and IEEE [Institute of Electrical and Electronics Engineers] journals.'* (EED1)

Another student reported:

*'My topic's roots go back to linear principles while my study focuses on non-linear ones. I used e-books to read about the history of linear control.'* (EED2)

**3. Other sources:** Most of the students in this stage confirmed that they used text books for basic information needed to develop their research proposal.

- **Textbooks and thesis:** A textbook is a book the students use during their courses. According to the findings, most of the respondents (EED2, EED3 and EED4) confirmed that they used textbooks as sources of information to complete writing their proposals. One student stated:

*'I read only two theses but I read mainly papers because my topic is very hot ...I used some books, but all of them are the books I studied or those [textbooks] which are supplied by the supervisor.'* (EED3)

Following is an excerpt from a conversation between the researcher and a part-time non-thesis student:

*'Researcher: So how did you write the report?*

*Interviewee: The textbook I have had the information and theory about the power divider and what it mean ... its definitions mainly.*

*Researcher: Can you use information from textbooks?*

*Interviewee: Yes, the information provided by the textbooks is easy to understand because it is simple and explained well, but using information which is published in papers is not an easy task' (EED4).*

Although both thesis and non-thesis project students in this stage prefer to use books for basic information, but they more often rely on journal articles to complete their proposal. One of the students stated that:

*'No, I did not search for books (general books) because, as I told you, my topic is hot and I am able to find more current and up-to-date information in the papers. We used only texts books to find the basic information but I am personally not gone with books'. (EED4)*

- **Design software:** For most of the students (EED1, EED3, EED4), the first demand would not relate to the use of the library as much as the use of laboratories and simulation software. One student stated:

*'I used MATLAB software to create the design and solve the equations and then to obtain the results and analyse them. The input will be the design, which I created in the form of equations; I will enter it into the MATLAB programme and wait for the results. If it is the expected result, and accurate, I know what I need to modify to gain a better result'. (EED1)*

Another student stated:

*'I used the same software I used before to present the projects for the same module. It is called ABF software ... I used this software to create the design and present the simulation. I used it to draw any microwave circuits and represent the required simulation and gain a result'. (EED4)*

In sum, the students were requested to select a current and original topic. In order to correspond to this request, the students tended to use e-resources—including databases, e-journals and e-books—rather than print books. They believed that print books would not be able to meet their information needs at this stage because such resources lack up-to-date information. Some students also relied on their supervisor to supply them with the required information resources, while others used textbooks to fulfil their needs. In addition, students have to use design software as a source of information for the implementation of their topic in the laboratory.

### **Stage 2: Mid-stage (data collection, data analysis, and writing up)**

In terms of the nature of the design process, the analysed data revealed that during the second stage, this issue does not influence or shape the role of the library, as the students have already selected their topics and checked the originality and validity for application in the first stage in order to create the design. This applies to both thesis and non-thesis students.

• **Information sources and resources used:** In this stage, the students tend to manage the data they gathered about their topic in the first stage to create their design. Using simulation software to process the data and verify the results demands a high level of information from experts in the field. The findings of this research confirmed that all students tend to use their supervisor as the main source of information and to support them in managing their data and determining their final results. The students need verbal information from experts to be able to manage their output and finalise their design, which cannot be achieved by searching the literature. As one student stated:

*‘The papers in the literature present the final results while I am still improving mine. At this stage, all I need to do is discuss the results I obtained with my supervisor to check if the results I obtained make sense or not...He will direct me if I am working on the right track and will suggest what other improvements I must apply. He will advise me about the weak points in the graphs. He might direct me to another professor who has more knowledge on my topic who might advise me to apply a specific method to gain better results. The other professor may use the same method, so he will have more experience to advise and direct me’. (EED5)*

The supervisor is not the only expert whom the students can discuss their results with and seek advice from. Other professionals, such as other academic staff (e.g. other professors in the field); can be consulted to seek their expertise as needed in this stage. At the same time, in processing the data and verifying their results, the students tended

to refer to the information resources they already used during the first stage. They referred to previously gathered information for two reasons.

**1. Comparing the findings with the literature:** Once the students obtain results, they are expected to compare them with similar studies. Some students might face difficulties in terms of understanding some unexpected results in each run of the implementation. In this case, they need to refer to information resources to understand the meaning of their results. One student commented as follows:

*'Currently, I am in the application stage; thus, I need papers that provide information that helps me to understand the theory and the topic's principles... I read again the papers which discuss a specific application, and then practice using different methods. I search for the information that explains the difficulties which we might face if we apply or use a specific method.'* (EED5)

**2. Improving the results obtained:** One student stated:

*'After conducting the simulation and gaining the result, the graph produced according to the result was strange ... I searched the papers which I saved before ... then I found one scholar who wrote an academic paper which presented the same result. After I thought carefully about what I did wrong, I realised that the problem could be with the sampling time'.* (EED6)

Although engineering students will use mainly personal research collections that they had selected, organised and stored during the first stage, it is necessary to carry out another search using the library collections and library EIRs when they begin to finalise their research report or thesis.

The results show that the use of library services and information resources has remained high, as the demand to complete the research project or thesis remained high. Both thesis and non-thesis students use the library for various reasons.

• **Accessing IEEE and other information resources:** In this stage, most of the students (EED5, EED7, EED8), confirmed that they used library subject-specific databases, such as IEEE, to obtain the e-journals they needed to complete their research. As one student reported:

*'I needed to go to the library when I needed to use the IEEE website because the website has an accessibility restriction. The library has a subscription to the IEEE website to access the information, so I can access it from the university campuses. (EED5)*

The students in this stage tended to use the ILL services provided by the library when the resources they needed were not available in the library. As one student commented:

*'Now the library's license to access the website is not valid anymore... if I need articles from IEEE, I need to search for the article's information provided on the Internet then supply the library with my inquiry and wait for the response'. (EED5)*

Another student stated that:

*'I requested the IEEE standards from the library I could not access them because the library subscription to IEEE had expired'. (EED7)*

• **Create the literature review:** In order to write their literature review chapter and the methodology/literature section, thesis students are expected to search and use diverse information resources. One thesis student asserted:

*'I made a general search to check what are the most well-known and common books in the field which were mentioned in the journals. I searched first on the Internet for the books using the books' titles then checked if it was available in the library... as you know I need to conduct regular searches to complete the writing up of the literature review'. (EED8)*

• **Review previous theses:** The students also need to use the thesis collection to support their research. The library allows the students to use this collection in the library. As the thesis collection cannot be borrowed, the students have tended to find a way to acquire a copy of previous colleagues' theses. As a non-thesis student reported:

*'I needed to go to the library and I extracted a previous colleague's dissertations and projects in the same field to learn what he did. So I learnt from the dissertation how to complete the conclusion, how to create the reference list and how to complete the abstract. So when I wanted to finalise my project, I went to the library and I took my*

*laptop with me, I put the previous dissertation in front of me and I followed his steps one by one'. (EED6)*

- **Use library services:** The students also need to use library services such as printing and photocopying to finalise their dissertation. One student stated: *'I was able to find in the library papers that cover a specific date, they were available as a hard copy and all I needed to do was to photocopy them'. (EED8)*

- **Use private study space:** One student stated: *'The library has quiet and convenient study rooms. I used them to complete my dissertation'. (EED8)*

To sum up, the students in the mid stage used the library and its information resources for different reasons. In order to finalise their research project, they visited the library physically to borrow books, used the library thesis collection or accessed the library database. They used ILL services if the resources they needed were not provided by the library. In addition, they may have needed to use the library space to complete writing their research project or dissertation. They also relied on their supervisor or other academic staff in order to finalise their results and create their designs.

### **Stage 3: Reflection on students' experiences**

The same factors appeared in stage 3 as were mentioned by the students who were interviewed in stage 1.

- **The nature of the design process:** The problem solving nature and the originality of the topic were also identified in this stage by all respondents. One non-thesis student stated that:

*'My topic is hot. It required searching for very recent and up-to-date information so I used to head directly to the journal papers. I was not heading to the library because the books available in the library were out of date; information available in the books was old and its validity is questioned. That is why you would see me always heading directly for the Internet to search for recent and up-to-date information'. (EED9)*

According to the above student's experience, the library is not the source to find recent resources to meet her needs. She needed valid and more recent information, and the print books provided by the library did not suffice because they are not up to date.

Another non-thesis student commented:

*'For the project, I had to search from scratch and justify my ideas and perspective. I had to provide a new idea and present a new report. I had to perform much reading and then select the information... and if I was unable to access a paper, I would seek my supervisor's help who is able to access the paper or he might use his own communication channels to contact the author directly to ask for a copy'. (EED11)*

According to the students' experiences, the topic determined the information source they used to meet their information needs. The library was not the main source of information the students used regarding the design aspect of their topic because other sources of information, such as the supervisor and the Internet, were available.

- **Information sources and resources:** In this stage, the students do not need to use any resources, as they had finished their research and submitted their non-thesis or thesis project. At this point, they need to disseminate their results and publish a paper. As one thesis student reported:

*'I stopped searching for information once I submitted my dissertation and I did not write or publish any papers, though I am still eligible to do so, I was unable to work out what I might need from the library to be improved. Maybe in the future, if I decide to publish a paper, I will be more capable of working out the weaknesses'. (EED10)*

To sum up, it can be inferred from the students' experiences above that the nature of the topic determined the type of information sources and resources used. The design aspect of the discipline has an influence on the topic the students selected, and this influences the type of information sources used. In addition, the demands of each task they performed affected which information sources they used to fulfil their needs.

Finally, from the evidence provided relating to the nature of the discipline, it can be stated that:

- The library information resources will be used less in building the proposal, as other sources of information, such as the supervisor, are available (Section 5.3.1.2, information sources and resources, stage 1).

- The more demand to complete the research project or thesis, the more library services will be used by the students (Section 5.3.1.2, information on sources and resources, stage 2).
- The more problem solving and original the topic is, the more EIRs the students will need (Section 5.3.1.2, The nature of the design process, stage 1, stage 3).

### 5.3.2 Information needs

In this case study, the ‘information needs’ of the students identified in the data basically consisted of the need to use specific sources of information to complete their research. Information awareness was the only element identified that shaped the information needs culture. This element will be discussed below.

#### 5.3.2.1 Information awareness

The examined data show that the students’ awareness about what information sources they need has an influence on their interaction with the library. As the students’ research progressed, so their information awareness developed. This element will be discussed as it relates to each stage of the research.

#### Stage 1: Proposal development stage

In this stage, the students need to choose a topic. To understand the topic, they must undertake background reading. As they are under time constraints, some of the students start the background reading in the modules to complete their mini-project because they are uncertain about the topic. The students are unaware of which source is more relevant to their research topic. One student commented that:

*‘At the beginning, I was not certain, my search was unintentional...I used Google to search for general information about my topic... I was able to find a massive amount of different types of information, some of it published in papers and on websites and I was able to find books which were published in PDF format. Also, I was able to find PowerPoint presentations published by experts, and theses. I’d select and use any type of information but it must be relevant to my topic’. (EED4)*

In this stage, the students search for general information to understand the topic. Therefore, they use any source that is readily available. Usually, they start their search on the Internet, as it is readily available and easy to access. After they undertake more searches, they become



aware of which information source will best meet their needs. The same student who commented above also stated:

*'I noticed myself that, on many occasions, Google directed me to the IEEE website to access papers in my field, so I knew that IEEE provides the papers I needed'. (EED4)*

Another student stated:

*'At the beginning, I was confused...I searched for information only on the Internet. I did not think about searching the printed journals available in the library...I did not know at the beginning that I can find what I want in the printed journals'. (EED1)*

From the discussion above, it seems that uncertainty about the information needed widened the information search to find the important sources needed. In other words, the more uncertain the students are about what information sources they need, the less they will use the library resources and services.

## **Stage 2: Mid-stage (data collection, data analysis, and writing up)**

As the project progressed, the students became more focused on their topic, and their information needs became more narrow and specific. Accordingly, they became more aware about what sources of information they needed to use. As one thesis student commented:

*'I know now that information channels can be varied, so accessing IEEE and searching for articles is not the only way to find information. There are printed resources available in the library which I can use to enrich my project'. (EED8)*

In addition, the recommendation of the supervisor about what information source is needed in each stage helps to develop the students' information awareness. The same student added:

*'When I felt that I need deeper and more valid information, my supervisor recommended that I used Google Scholar because it has more valuable and richer information resources'. (EED8)*

Another student who was writing up her research project commented:

*'On a few occasions, I had to go back to some books as I was referred to them by the papers; most of the books I was referred to were electricity books which were unavailable in my workplace's library. Thus, as soon as I noted down the books'*

*titles, I went to Kuwait University Library to search for them. Frankly, I did not experience once any problem with finding any title; all the titles I searched for were available'. (EED6)*

From the discussion above, it seems that the students became more aware about what information sources they needed as their research developed. Their supervisors' recommendations also help in developing their information awareness during the research process. In other words, the more aware the students are about which information sources should be used, the more the library resources and services will be used.

### **Stage 3: Reflection on students' experiences**

According to the students' experiences in this stage, the same factor that appeared in stage one was mentioned. The students' awareness of what sources they need to use developed during their research stages. One non-thesis student commented:

*'At the beginning, it wasn't that easy to search because I did not know where to search... but my supervisor was the one who directed me to access and use the IEEE website to search for papers and also he recommended that I use Google Scholar'. (EED9)*

When the students were engaged in analysing their data, the Internet became important to them. As they had collected enough information in the first stage about their topic, what they needed in this stage was to identify the gap in the application of their design to improve their results. One student stated:

*'The main channel for searching for information after I selected the topic was the Internet; I did not visit any library and I did not use any book. Completing the project depends mainly on the student's effort to complete the required analysis. To complete the analysis, I used computer programs and software...as I collected all the information I requested from the Internet'. (EED12)*

As the students' research progresses, they become more aware of what the most important sources are for their research. One thesis student stated:

*'The IEEE website was the main channel I used to collect the required information and to access the articles I needed. To me, using the library was the main factor in completing my dissertation. I mainly used articles and only one book which I had in my personal library to complete the research'. (EED10)*

To sum up, it can be inferred from the students' experiences outlined above that information awareness has an influence on their interaction with the library's resources and services. During the research process, the students' information awareness developed as the demands of each stage developed.

According to the findings regarding the information needs culture for each research stage, it can be stated that:

- The more uncertain the student about which important information sources need to be used, the less they will use the library services (stage 1).
- The library will be used more as the students develop more information awareness (stage 2).
- The more awareness about the need for the library, the more its resources and services will be used (stage 3).

It can be seen that information needs influenced the role of the library throughout the research process. In the first stage, the low degree of library use is associated with the high degree of students' uncertainty about what information sources to use. It can be argued here that the low use of the library might be linked to the supervisor's behaviour in terms of providing the students with the required information not only to select the topic but also to complete the entire research project or thesis. While in later stages, the high degree of library use was associated with a high degree of students' awareness about the importance of the library as an information source to support their research.

### **5.3.3 Study mode**

Some of the electrical engineering Master's students were part time and some were full time. The students' study mode (part-time or full-time) is identified from the data as a variable that influences the student's interaction with the library resources and services but not the research process itself. Two elements influenced by the study mode emerged, which are availability and accessibility. These two elements will be discussed in the following sections.

#### **5.3.3.1 Availability**

The availability of the students, the availability of library hours and the availability of library resources and services are three issues relating to the element of availability that emerged. These issues are discussed below.

- **Availability of the students:** The accounts provided in this case study show that part-time students visited the university campus less frequently due to their work commitments. Therefore, they were not heavy users of the library resources and services. As some of the library services offered to them are only available from 8:00 am to 2:00 pm, they were unable to benefit from these services due to other commitments. However, full-time students are usually able to visit the campus more regularly and can access and use the resources and services provided by the library.

According to a conversation between the researcher and a part-time student who selected the non-thesis option at the proposal stage, the lack of freedom to visit the campus prevented her from using the library services.

*'Researcher: do you have any idea about the interlibrary loan services provided by the library?'*

*Interviewee: Yes, my supervisor mentioned this service to me, but I do not think it can be practically useful to us, I mean students who work. I personally work in Al - Ahmadi which is far away from the university and I cannot leave my work every day to go to the library. To me, it would be easier to buy a paper rather than leave work or go in the very early morning to the library to request papers'. (EED4)*

Another conversation with a full-time thesis student in the mid-stage confirmed that his ability to visit the campus enabled him to use the library services.

*'Researcher: you will be able to find all the issues listed in the card catalogue?'*

*Interviewee: Yes, but always the last issue was not available; for example, I was able to find the 2010 but not the 2011 issue. In my research, I needed an article published in 2011 and, because the issue was unavailable, I had to find my own way to get the article. I completed a statement and asked my supervisor to sign it then I submitted a request to the library which provided me with the article later.*

*Researcher: you mean you used the inter-library loan services.*

*Interviewee: Yes exactly'. (EED8)*

As can be seen from the above conversation, the ability of full-time students to be on campus during the daytime saved them time and improved their interaction with the library. Due to work commitments, part-time students could not be on campus during

the daytime, which prevented them from using the services offered by the library. It is important to mention that the statement that the students who are on campus less frequently use the library resources and services less is correct during all the research stages for both thesis and non-thesis students.

- **Library hours:** The library opening hours are from 8:00 am to 9:00 pm. Part-time students who are committed to their work cannot use the library resources and services during the daytime and committed to attending lectures from 4:00 pm to 9:00 pm. Unfortunately, the library is closed by the time their lectures end. Therefore, they are unable to access and use the library resources and services. One part-time thesis student commented:

*'I was not a full-time student; usually, I used to start my day at the university at 4.00 pm. By that time, the library will be closed, especially when I had late lecturer which used to end at 9.00 pm. Therefore, I used to work from outside the university or sometimes in my own department'. (EED10)*

Another part-time non-thesis student recommended that the library should extend its opening hours so that part-time students can benefit from the services provided. When asked what the library should provide for him to support his research effectively, he said: *'First thing, the library should open 24 hours' (EED11).*

It seems that the library opening hours affect the role of the library in supporting the students' research. Part-time students are available for only a few hours in the evening, which affects their use of the library as a main source for supporting their research.

- **Availability of library resources and services:** An examination of the interview data makes it clear that inability of some students to be on campus forced them to use the Internet as their first option when searching for information resources because the information provided by the library to access its resources remotely was unavailable to them. One part-time non-thesis student in the mid-stage stated that:

*'I used mainly to search on the Internet because I am an employee who works during the daytime; thus, I had no time to go to the library in the morning. I could access the Internet easily from my office at work and search for the information I needed'. (EED5)*

Another part-time student who used the free access to the IEEE website provided by her workplace via the Internet commented:

*'I conducted most of my searches on the Internet as I was able to access IEEE journals from my workplace so I had easy access to academic articles. So I used the Internet heavily to create my literature review'. (EED6)*

Regarding remote access of the OPAC, one part-time non-thesis student spoke about his experience with the library as follows:

*'Researcher: So you used the online catalogue to search for books?'*

*Interviewee: Yes, I used the search box available on the interface of the online catalogue to search for them. Now, as soon as I have all the title of the books available on my topic, I will access Google to search for the books and read their table of contents. Once I know them all, I will be able to decide which books can be useful to me and meet my needs, I will select and save them in my own reference list. Using this method allowed me to reduce the list of books from many to only four or five. Once I completed my list, I can go to the library to collect them without wasting my time searching in the library to see which is useful and which not. Personally, I don't like to go to the library to browse each book to decide whether it was suitable or not'. (EED11)*

From the above, it can be noticed that the students used alternative sources of information because the information provided by the library to access its resources remotely was unavailable to them and also because other sources of information were available. The inability of part-time students to be on campus during the daytime prevented them from visiting the library to request the information to enable them to use the library services remotely. A few respondents mentioned professional websites such as IEEE as one of the most common resources the students used to access credible papers. These students' interaction with the library was mainly affected by the availability of library resources. In other words, the more available remotely accessible resources are, the more the library will be used.

### **5.3.3.2 Accessibility**

The inability of part-time students to be on campus during the daytime prevents them from accessing the library physically. They have no time to visit the library during the daytime and attend lectures in the evening, and unfortunately, the library is closed by the time their lectures

are finished. While they are working in the laboratory, they can access the library virtually through the department. Many issues emerged related to the accessibility of the library resources and services in terms of affecting the role of the library. These issues are discussed below.

- **Access points:** Library access points for its online resources and services are provided both on and off the university campus for graduate students. IEEE cannot be accessed off the university campus unless the students have access information provided by the library. A full-time thesis student in the proposal stage commented:

*'We cannot access the IEEE website's database from outside the university. The student must have an account and university membership to be able to access it'. (EED2)*

Students can access e-journals from the departmental computer while they are in the lab without needing to interact with the library. One part-time thesis student asserted:

*'[...] I do not have time; I work only twice a week on my thesis ...When I am at the university, I use this chance to search for papers because it is the only time I can access the papers'. (EED3)*

She added:

*'It is not necessary to access resources via the library, I can access them directly via the department website itself, but I need to use the university access information. For example, when I access it, I can see a message that says "Hello Kuwait University"'. (EED3)*

If the students are unaware that they have to request the access information from the library to access resources from outside the university, they will not use the online resources and services. One part-time non-thesis student commented:

*'I personally had a university password and username which I used to access from home but some students do not have the access information so they were unable to do so. Some of the students are old. They graduated long ago and recently started the master's degree. Such students do not know that there is access information'. (EED11)*

It can be seen that the less aware the students were about access to the library resources and services, the less library resources and services will be used.

• **Invalid e-journal subscription:** It is interesting to note that both part-time and full-time students mentioned IEEE as one of the most important sources of information that was accessed via the library. According to one part-time non-thesis student, the accessibility to IEEE provided by the library had ceased. She stated:

*'I faced a problem at the beginning when the access to IEEE was impossible because the subscription to the journals was no longer valid. I needed a specific paper and I had to request it from the library. I think the library requested it from IEEE'. (EED1)*

This issue prevented the students from using IEEE. The students were forced to depend on the Internet as access was relatively easy. Another part-time non-thesis student commented:

*'Anyway, I was able to find the information I needed on the Internet. Everything was available on papers. So I will not need to use IEEE if I was able to find ready available information published on the net. If I searched the Internet and found the information I needed, I would not go to the IEEE website'. (EED5)*

It can be noted that the more the library subscribes to leading databases in the field, the more its resources will be used by the engineering graduate students.

• **Library restrictions:** The library thesis collection cannot be borrowed or even photocopied. The students have to use the theses inside the library. These restrictions on the thesis loan system can limit the use of this collection by the graduate students. As one student stated:

*'The library does not allow us take theses out of the library; we can only review them inside the library'. (EED9)*

One part-time thesis student who had no time to visit the library tried to find a way to obtain some of her colleagues' theses from the department. She stated:

*'As far as you know, when a student submits a dissertation, he should provide the examiner and the supervisor with a copy of his work, so I asked one of the faculty*



*members to lend me both dissertations and they were both completed by previous colleagues who studied in the same department'. (EED10)*

It can be seen that as the library places greater restrictions on access to its collection, the less its resources and services are used by the graduate students. It is important to note that the statement the less library accessibility provided, the less its resources and services will be used is correct for both thesis and non-thesis students during all the research stages.

To sum up, the culture of the study mode influenced the role of the library in supporting the students' throughout the various research stages. The lack of availability of library services combined with the inability of students to be on campus during the daytime and the lack of availability of remotely accessible information resources negatively affected the role of the library. There were also some issues related to the accessibility of resources via the library. Those issues are library access points, library restrictions and invalid e-journal subscriptions. The more interesting issue mentioned by some of the respondents is that the academic department provided the students with the information needed to access IEEE, one of the most common information sources. Therefore, many students found there was no need to access the site via the library because it is accessible via their departments, which were more accessible in terms of open hours.

Based on the evidence about the study mode culture for all the research stages, it can be stated that:

- The less available the students, the lower the use of library services (Section 5.3.3.1, student availability).
- The longer the library is open, the more it will be used by the students (Section 5.3.3.1, library hours).
- The library will be used more if more remotely accessible resources are available (Section 5.3.3.1, availability of library resources and services).
- The more library accessibility provided, the more its resources and services will be used by the students (Section 5.3.3.2, access points and invalid e-journal subscriptions).
- The greater the library accessibility restrictions, the less the library resources and services will be used (Section 5.3.3.2, restrictions on the library's theses collection).

### 5.3.4 Students' personal experiences

The students' personal experiences in the context of this research reflect each student's perceptions of the library services provided and their feelings regarding their use of library resources and services. The findings of this case study revealed three elements that help shape the personal experiences of the students regarding the library. These elements are the performance of library services, students' personal feelings and students' personal attitudes about using the library resources and services. These elements as they relate to each stage of the students' research are discussed in the following sections.

#### 5.3.4.1 Performance of library services

Both part-time and full-time thesis and non-thesis students complained about the library's performance. According to them, the current performance of the library service is inadequate as it is unable to meet their needs. These needs varied throughout each stage of their research, and the library should be able to meet those needs. The library has to provide them with the potential services (online subject-specific database, ILL etc.) to support them throughout their research activity. This element is discussed as it relates to each stage of the students' research, as follows.

##### Stage 1: Proposal development stage

The students' needs at this stage are limited in terms of finding and searching for information to build the background knowledge required and to be able to choose a topic. All they need in this stage are credible journal papers to enable them to decide their research topic. The library's performance during this stage is limited to providing the students with the information resources needed. If the library is unable to perform at a level that meets the students' needs, they might not use its services again. One student stated:

*'The university library used to subscribe with IEEE but recently this subscription became invalid and this was the case during my project. Therefore, I sought my supervisor's help. So he used to supply me with the papers I needed...I will seek my supervisor's assistance as he has an account with IEEE and is able to access the papers as a full text'. (EED4)*

In a conversation between a part-time thesis student and the researcher regarding whether she used the ILL services to get papers she could not otherwise access, the student commented:

*'Such a service [Interlibrary loans] will take time and I cannot wait, seeking my supervisor's help will be quicker...I cannot wait because I will lose the idea so the best way is to seek my supervisor's help'. (EED3)*

Based on the above, it seems that the library services are not performed to the level that can meet the students' needs at this stage. The students need readily available and easy-to-access information as they are engaged in laboratory work and have no time to waste. Therefore, they used the supervisor as an information source because he is available and easy to access.

## **Stage 2: Mid-stage (data collection, data analysis and writing up)**

The students' needs in this stage are more complicated as they need to use the different types of library services to be able to build their research. A part-time non-thesis student whose project is theory-based and requires different types of resources, such as standards, stated:

*'The main thing I based it on was the standard published by IEC (International Electro-technical Commission)...the University library used to provide the students with the standards but unfortunately when I became a graduate student, the library stopped this service and cancelled its subscription with the IEC, so it was a struggle to find the standards...I used the library only once. I went to ask them for the standards and they were unable to supply me with any and that was the last time I visited the library'. (EED7)*

A full-time thesis student complained about the automated library system, specifically the electronic periodicals catalogue. He stated that:

*'The main problem with the journal's electronic system provided by the library was the lack of information about which years the journals are available. The library only stated the year of the first issue of the journals available but no more information about the later issues'. (EED8)*

The same student suggested improving the online book renewal system, as he needs to borrow books to finish his dissertation. He stated:

*'Now, the library has made the renewal system much easier and extended the borrowing time. The library needs to improve the reminder system; it could use email to remind us. This process can be very easy by setting up a process whereby reminder*

*emails can be produced easily, so they do not have to recruit specific staff to do so'. (EED8).*

Based on the students' statements above, it seems that the library needs to optimise its performance to a level that can satisfy the complicated needs of the students in this stage. Some students need special types of services for specific kinds of research. Special information resources, such as standards, were unavailable in the library. If the students do not find what they need in the library, they may not use it.

### **Stage 3: Reflections on students' experiences**

Students with different programme options reflected on their experience of using the library services and suggested various improvements that might be made to the library's services in this stage. Their suggestions were as follows.

- Update the library's electronic catalogue information. As one student suggested:  
*'The library should update the system with the new information and locations of the books ... and it should do that regularly because, on many occasions, I saw that the book was available on the online catalogue, but when I went to the library, the staff told me that the book had been loaned out two days ago; so why don't they update the system?'* (EED11)
- Improve the organisation of the theses collection inside the library: One student claimed: *'I needed to use a thesis but I did not find it'*. (EED12)
- Transform the library's print collection into electronic materials in the form of PDF files. One student stated:  
*'I will use the library regularly on only one condition—if the library became an electronic library...Because it will be easier to use ... the students need easy access to information. I do not want to go to the library to search for books using the card catalogue and I do not want to visit the library to climb stairs to be able to reach the books stored on every floor, so if they were able to provide us with an electronic library, even with a small fee to access or download PDF documents, I'd be very pleased'*. (EED9)
- Increase the accessibility of the library databases from outside the library. One student stated:

*'The only problem was the accessibility as my search would lead me to a source which I do not have permission to access. Some of them will request a user name and password which I did not have so that prevented me many times from accessing papers. It would be great if the library provided us with open access for all its databases from outside the library'. (EED12)*

To sum up, in light of the above facts identified in each stage, the performance of library services seems inadequate from the students' perspective to satisfy their needs. Their specific research needs necessitated a certain level of library service. If the library services are unable to meet the students' needs, the students might not use the services again. Low use of the library services by the graduate students will be the result of inadequate performance of the services.

#### **5.3.4.2 Personal feelings**

The students' feelings in regard to the library services have been identified in this research as one of the most important issues shaping their personal experiences. Such feelings and experiences develop throughout the research process. This element as it relates to each stage of the students' research is discussed below.

##### **Stage 1: Proposal development stage**

Students who had negative feelings towards the library at this stage had a negative image of its services and therefore avoided using the library during their research process. One part-time non-thesis student stated:

*'I remember, I tried once to use the printed journals to extract the papers I couldn't access online ... one of the staff directed me to the IEEE journals section but he did not show me what to do and I did not know what to do; he told me that not all the issues were available so I feel that it would not be an easy job to find what I am searching for. So to save time I either bought them or sought my supervisor's help'. (EED4)*

Although the library staff member directed the student to the resource needed, he did not make any effort to help. The unavailability of information along with the poor performance of the librarian led to the students' negative feelings. As the student had a time constraint, she avoided using the library and sought her supervisor's help instead. In other words, the more negative feelings the students have about the library staff performance, the less they will use the library services.

## Stage 2: Mid-stage (data collection, data analysis, and writing up)

The lack of information services provided by the library at this stage results in poor use of the library and less searching for information. This leads to negative feelings, as the students are under the pressure of time and need readily available information. This was confirmed in a conversation between the researcher and a part-time non-thesis student:

*‘Researcher: While you were completing your project, didn’t you need to visit the library?’*

*Interviewee: No, there was no need to use the library as I told you my topic concerns a maintenance issue; it is an experience-based issue.*

*Researcher: What about the engineering library?’*

*Interviewee: I don’t know, I did not search in it.*

*Researcher: Why?’*

*Interviewee: I couldn’t find the documents I needed so why would I need to do that? ... I could not find a paper that discusses the transformer’s test and how I could perform it. I wanted papers that study the process of maintaining electricity transformers, but the only thing I was able to find was the standards on the Internet’. (EED7)*

The negative feelings the student developed due to his bad experience with the library services made him avoid using the library. The unavailability of the resources he needed for his specific topic made him feel that the library was unable to fulfil his needs. Because the student perceived that the university library collection was not useful for meeting his needs, he used alternative sources, such as the Internet.

In addition, the students trust their supervisor and will therefore use the services recommended by the supervisor. One full-time thesis student commented:

*‘As a postgraduate student, borrowing books from the library was a new experience so I started to learn how to use the library and what is the value of using the library’s collections and I have learnt how to renew books online ... Also, my supervisor mentioned that if I couldn’t find what I was searching for, I can request it from the library... I feel that the library is able to provide me with unavailable issues and articles and I can request what I need via the inter-library loan service’. (EED8)*

As the thesis students needed to conduct more textual research, they had to interact with the library more than the non-thesis students. During the research process, the students' image of the library developed as the demand for its resources increased. Because of the recommendations of their supervisors, these students developed a positive feeling about the library services. In other words, the students' feelings about the library improved as more recommendations about the library came from their supervisor.

### **Stage 3: Reflection on students' experiences**

As the students had submitted their non-thesis or thesis projects, there were no issues identified by the students interviewed in this stage.

To sum up, in light of the above evidence, the negative feelings the students developed as a result of their interaction with the library during the research process might deter them from using the library. However, the recommendations of supervisors to use the library services helped to counteract the negative feelings established during the research process. If the students interact with the library services based on supervisor recommendations, they can build good feelings about the library services. In other words, use of the library increased as the students' perceptions about the library's resources and services improved.

#### **5.3.4.3 Personal attitudes**

Positive or negative attitudes about gathering the information resources needed influenced the research process. Over half of the respondents interviewed had a positive attitude about collecting information at the beginning to be used at any stage during the research. In some cases, the building of this collection started in the very early stages, sometimes prior to the final decision about the research topic. This element as it relates to each stage of the students' research is discussed below.

#### **Stage 1: Proposal development stage**

It was found that over half of the participants in this stage had positive attitudes towards collecting as many information resources as possible to be used in the later stages. These information resources either gathered from their supervisor or from other available sources. From their perspective, they save themselves time by adopting such an attitude. One part-time non-thesis student stated:

*'During the summer, I discussed with him [the supervisor] all related ideas and I carried out some searches which helped me to create a clear image about the topic.'*

*I searched on IEEE... I also used Google... By searching Google, I was able to find a massive amount of different types of information... I personally did not download them because I was browsing them online from the website. I did not find any reason to do so; I only saved them on the favourites to be used in later stages when needed'. (EED4)*

Another part-time thesis student stated:

*'Well, it is enough... I know most of the important papers published on my topic. Of course, there are a few papers I did not review but what I have collected already is sufficient to complete the proposal... I have many papers that present such information which my supervisor supplied me with. So I don't need to conduct a literature search'. (EED3)*

The students' intention to build their research-related collection in this stage was related to preparing all the information resources necessary to proceed with the implementation process. As they will be engaged in practical work in the later stages, they should build their personal knowledge about their topic before commencing implementation. In addition, they will be occupied with laboratory work in the later stages and their time to conduct searches of the existing literature will be reduced.

## **Stage 2: Mid-stage (data collection, data analysis and writing up)**

This positive attitude (build research-related collection) did not appear at this stage, as the students had already built most of their collection at the earlier stage. In a conversation between the researcher and an engineering student in the mid stage, when asked if she needed any information to help her understand what her results meant, she said:

*'Yes, but it will be the same papers I used before and I will read them again. Anyway, I will select from the beginning many papers related to my topic and I will read them one by one as required and as my research developed. If I experienced any lack of understanding, I will go back to the papers and check the method I am using to learn more'. (EED5)*

When asked again what sort of information she needed when writing up her research project, she said:



*'The information I need now is all available in the papers I have already extracted and I have no need to search for more books ... ummm, there is a colleague in the engineering department, I sought his help about books and he supplied me with a few of the books he had.*

*Researcher: In which stage did you seek his help?*

*Interviewee: At the first stage.*

*Researcher: So you sought his help because he has books about your topic?*

*Interviewee: Or related... I saved any book related to my topic on my desktop then I will read it as required, I have basic information as well as deep information'.*

*(EED5)*

The conversation above provides evidence that the same personal attitude about creating part of their personal research collection was already in place in the earlier stage.

### **Stage 3: Reflection on students' experiences**

In terms of personal attitudes, there is no indication that this element was identified in the interviewees' responses in this stage, as the students had submitted their research projects or theses and had no need to collect any more information.

To sum up, in light of the above evidence, the students' attitudes towards collecting a broad spectrum of information at the start influenced the research process. As the students' research projects developed, this attitude became more narrow and specific. In other words, the use of the library services will decrease as the students' personal research collection increases.

Ultimately, and in light of the above facts related to the students' personal experience in each research stage, it can be stated that:

- The low use of the library services by the students is a result of the poor performance of services provided (5.3.4.1, stage 1, stage 2, stage 3).
- The use of library services and resources will decrease as the students' have more negative feelings about library staff (5.3.4.2, stage 1).

- The use of the library will increase as the students develop more positive feelings about the library due to supervisor recommendations (5.3.4.2, stage 2).
- The use of the library will increase as the students' attitude toward building their personal research collection improves (5.3.4.3, stage 1).
- The use of the library services will decrease as the students' dependence on their personal research collections increases (5.3.4.3, stage 2).

### 5.3.5 Library information services

The analysed data show that library information services have an influence on students' use of the library and information resources. Training and support are identified as the most important elements that help in shaping the information services provided by the library. This element as it relates to all stages of the students' research is discussed in the following sections.

#### 5.3.5.1 Training and support

Training and support in this research reflects students' need for systematic, instructive training to learn how to use the library, including the different types of information resources and services. Although the library provides training sessions for users as requested, it has not targeted electrical engineering students by offering specific sessions. This research has identified three issues related to training and support—the promotion of services, personal effort to undertake training and supervisor support, which are discussed below.

- **Promotion of services:** Marketing is an issue that helps shape the library's information services. None of the students who participated in this research received training designed by the library, as most of their knowledge about the library came either from the supervisor or through personal 'trial and error'. Most of the participants in this research claimed they did not receive any type of promotion message to attend a training programme. The following short conversation was held between the researcher and a part-time student with regard to her awareness of any workshops provided by the library:

*'Researcher: The library used to provide a workshop to educate students how to use the online information resources; have you ever heard of such a workshop?'*

*Interviewee: No, no one told me. Frankly, this is the first time I heard about that, I have just heard from you now... to tell you the truth, until now, I search randomly. I search by trial and error based on the results'. (EED6)*

Another part-time student reflected on her experience with the library in every research stage. She stated:

*'I do not know anything about such workshops, though they would be very useful for graduate students. We need such training courses. I think the library needs to provide extra advertisements... to tell you the truth, even now, I do not know how to search for a book in the library. I have never ever tried to do so, and I did feel I needed to do that'. (EED12)*

From the discussion above, it seems that the promotion of library services is inadequate for reaching all types of students, especially part-time students who are less able to come to campus. The library should extend the promotion of its services so that all students can become acquainted with them. If students do not know what services are available, they cannot use them. In other words, the more the library promotes its services, the more the students will use its training services.

- **Self-Training:** The students' ability to search and use information to fulfil their needs reflects their information skills. It was mentioned earlier that the students did not receive systemic training to improve such skills as most of their training consisted of their own efforts using trial and error to find relevant information. In this case, what shapes the training element is their personal effort; the library does not appear to have any influence. The examined data show that trial and error was used by both thesis and non-thesis students to improve their information skills. One student in the proposal stage stated:

*'I used the keyword method... At the beginning, I was searching for non-linear models; I did not have in mind a specific topic so that is why I felt lost... I obtained irrelevant results... I regularly changed the keywords I was using... if I found some papers that interested me, I would search for related papers or save the title and search the reference list; something like that'. (EED1)*

This method was used across all stages equally, as needed. One student in the mid-stage stated:

*'I am more capable now. I am better able to know which information resources can be useful to me, how to carry out a search and which keywords I should use to search the Internet... what can I say? Your sense about the topic becomes developed, so your search skills will be improved'. (EED5)*

As the students practiced searching for information related to their topic, their information skills developed. One student reflected on his experience throughout the research stages:

*'At the beginning, I was searching using one keyword, and then I learnt through practice that I can search using the word's synonyms. Also, I have learnt how to extend my search... the keywords I used to use increased. I became more capable of searching more than one site... I have learnt which are the relevant sites to my topic, how to access them and how to use different keywords to search for information'. (EED9)*

It can be seen from the above evidence that the information skills of the students developed through their personal effort of using trial and error during the research process. The library appeared to have no influence on developing the information skills of the students. In other words, the less training support the library provides, the more personal training methods the students will use.

- **Supervisor support:** Across all the research stages, the training role of the supervisor was apparent. For all thesis and project students, the supervisors played the main role in training them to be able to start their search and choose a topic. Supervisor support with regard to every stage of the students' research is discussed below.

The supervisors provide training support to improve both the students' information skills and studying skills. In terms of information skills, one student in the proposal stage stated:

*'My supervisor helped me from the beginning by performing the search. For example, the first time I went to him after I selected the model... he searched... in front of me and selected a specific model then asked me to carry out more searches... So every time I carried out a search and obtained a result, I used to seek his opinion and listen to his recommendations. My main concern was to find someone who is able to help with carrying out the search and he helped'. (EED1)*

One thesis student in the mid stage commented:

*'I was able to gain experience from my supervisor ... who is very active in the area of my research. By the way, I have learnt how to use cited by hint [Google] from my supervisor. I have learnt from him how to extend my search and I have learnt that reading cited by papers can open up a new possibility for more research'. (EED8)*

The students trust their supervisor's knowledge and experience; therefore, they seek training support from him. One student who reflected on her overall experience explained the role of the supervisor:

*'I had no strategy, I searched randomly...So I searched for any word I thought was related to my topic, then checked the emerging results to select the relevant ones... I remember, once, I saw my supervisor using (+) for example to combine two keywords in his search when I visited him in his office. When I saw him doing that, I tried to follow his strategy to get what I needed'. (EED12)*

In sum, the library information services influenced the role of the library. The lack of effective publicity about the services provided together with the training role played by the supervisor negatively influenced the role of the library. The less known the library services are to the students, the more reliant they will be on their supervisor and their own personal efforts to develop their information skills.

Therefore, in light of the above findings related to library information services, it can be stated that:

- The more promotion services a library provides, the more use its training services will be used (promotion of services).
- The less training support the library provides the more personal training methods students will use to improve their information skills (self-training).
- The fewer training sessions a library provides, the greater the role of the supervisor as an information skills trainer (supervisor support).

### **5.3.6 External information sources**

External sources in this study can be defined as the sources available outside the university library. Across all interviews, the external sources appeared to have a great influence on the

library's role in supporting each student's research. In this case, the various information sources used were based on the students' project type rather than in regard to the research stages. The Google search engine, experts in the field and non-university libraries and the supervisor are four external information sources in this case study. These are discussed below.

A. **Google search engine:** Much of the information required by engineering students for their research is now readily available on the Internet via the World Wide Web. One student commented: *'99% of my research is internet-based searching'*. (EED7)

The greatest threat to the library's role, after the supervisor, is the search engine Google. As most of the students confirmed that they used the Internet either from home or their workplace, in this case the Internet can be regarded as an external source. Many students during the interviews mentioned the term 'Google' to reflect their heavy use of the internet and all of its different tools to complete their project. As one part-time student in the proposal stage reported:

*'I used to access the Internet from my workplace to search on Google, and my search inquiry used to come up with a massive amount of articles...I searched on the Internet for tutorials which teach me the [software] usage's steps. I searched on YouTube for videos and tutorials. I have learnt many things from them which I did not know before'*. (EED4)

Another student in the mid stage asserted:

*'To tell you the truth, I prefer to sit at home and work on the Internet from there... I search using simple Google... currently; the papers I found on the Internet were more than enough to provide me with the required background... I prefer to access other universities' websites to read their lab reports. If I find something related to my topic I will read it. Hmm...I remember, sometimes, I read device manuals related to the complainer... also, I search on Google images to search for the simulation's graphics; if I find any interesting ones, I will search for the source and read the related texts'*. (EED5).

As most of the interviewees are part-time students who have less availability on campus, they found the Internet an alternative way to meet their needs. The Internet is available outside the university at their workplace or at home, and easy to access. If all the information they need for their research is available on the Internet, they will not use

the library services. As one part-time student reflected on his experience during each research stage:

*'To tell you the truth, the library's reference collection is rich but I personally could not ignore the Internet... when I went to the library to collect the books I needed, I discovered that the library has books which explain and study the same ideas I searched for on the Internet. This means that the books were available but I did not use them because I was able to find the information I needed on the Internet and, because I was short of time, I did not read the books as I had already collected the information I needed from the Internet'. (EED11)*

- B. **Specialists in the field:** In this study, only one non-thesis option student intends to search for experts in the field to gather information and information resources from them, as his type of project is based on experience. He stated:

*'Once I attended a workshop which discussed the oil in electricity transformers. A scholar who wrote a well-known handbook attended the workshop so I was able to obtain his book. The book was a useful reference and it was published by a credible company, and therefore this book helped me cover the issue related to one aspect of my project, which is oil transformers'. (EED7)*

- C. **Non-university libraries:** Students can gather information from any library to which they have access. Only one non-thesis student in this study confirmed that she used other libraries, such as the one at her workplace. She stated:

*'As I work at the Kuwait Institute for Scientific Research [KISR], I have free access to the journals and I have learnt how to search and find the articles that I need... as I have open access for many databases through my workplace, I used to access them to search for articles. Sometimes, I searched on the IEEE website for the articles then printed out what I found and read them'. (EED6)*

- D. **The supervisor:** Most of the students stressed that research requires a supervisor, and that the more knowledgeable and supportive the supervisor, the less dependent the student is on the library. One student in the proposal stage commented:

*'To tell you the truth, everything depends on the supervisor. I mean... he is the one who guides me... what to do and where to go... when I used to meet him, he used to*

*teach me for example how to use the author's name to search for the author's articles and works. Also, he taught me how to access papers and check the citations. He taught me how to carry out a search on a specific topic... he is the one who helped but I did not seek anyone's help from the library'. (EED1)*

In addition, the findings of this research have shown that most students considered the supervisor to be a knowledgeable person. He/she is the only one who can help them to survive very stressful situations; to most of them, choosing a good supervisor means good research activity. When asked why she would not seek the librarian's support, one student said:

*'[they] will not be more helpful than my supervisor... When I was unable to access the full texts, I had to ask my supervisor who is a professor and he knows where he can access them. To him, it will be easier to access the papers and find them, because this is his area of knowledge and he has access to the papers'. (EED3)*

Another student stated that during the research process, she did not seek anyone's help except that of her supervisor:

*'The only one I sought help from was my supervisor... he was the one who supplied me with all the papers I needed. I remember he has on his desktop a massive number of papers and he used to extract some of them as soon as I requested help; his support helped me save time. That is why I was able to complete my project during one course'. (EED12)*

This element, which shapes the meaning ascribed to the external information source, appeared across all the stages and was identified by students with different types of topics and different enrolment status. The students trust the knowledge of their supervisor and do not believe that any one can provide the same level of support as their supervisor. The students depend on him as an information source, and this can influence their use of the library. In other words, the more dependent the students are on the supervisor as an external source, the less they will use the library.

To sum up, in light of the above facts, four types of external information sources were identified across all research stages. Whilst all the students named Google as the main source from which they seek information, the project students added other professionals, such the supervisor, experts in the field and other professional libraries as possible sources of information. Overall, it can be stated that:



- The more Internet resources available externally, the less contribution the library makes to the student's research (Google search engine).
- The more need for information from experts in the field, the less use of the resources provided by the library (specialists in the field).
- The more accessible the resources at professional libraries are, the less use of the university library's resources and services (non-university libraries).
- The more dependent on the supervisor the students are, the less likely they are to use the library services (the supervisor).

### 5.3.7 Financial adequacy

This cultural issue reflects the students' financial capability to purchase information resources to support their research activities. Ability is the only element identified that shaped the financial adequacy theme. Students buy their information resources, including books and journal articles, because they have the required funds to pay for them as they are unwilling to wait or waste time waiting for the library to meet their needs. The finding of this research suggests that this issue has no influence on the research process itself but does have an effect on the students' interaction with the library. This element is discussed below.

#### 5.3.7.1 Capability

It was found that engineering students intended to buy their information resources as they are constrained by time and because there is a lack of trust that the library would be able to meet their needs in time. This fact appeared across all stages. In other words, the students buy different types of information resources as needed when the library is not able to provide them with what they need. Three students in this case study (EED1, EED4 and EED7) confirmed that they do this. One student stated:

*'Most of the papers I needed were available on IEEE and others were available on the Internet... to tell you the truth, I bought some papers I could not access, so if you can't access the papers you need, you have to buy them'. (EED4)*

Another student confirmed that he pays an access fee to some online databases for which the library cancelled its subscription. He stated:

*'Interviewee: [...] I logged onto the IEC website and I found many standards, the cost of each was \$200 to \$300.'*

*Researcher: So you have to pay to be able to access them?*

*Interviewee: Yes, every standard is no more than 20 pages but it cost over \$200.*

*Researcher: So you weren't able to find free copies?*

*Interviewee: I was able to gain only one copy or maybe 2 but I was able to access more by subscribing to IEC'. (EED7)*

As the students have the required funds to pay for the information resources, they will not wait for the library to meet their needs. It can be seen from the evidence that financial adequacy is another factor that has an influence on the students' use of the library. It can be concluded that the role of the library decreases as the students' financial capability increases.

## 5.4 Emergent issues

This section presents some issues that emerged from the above data analysis that relate to the role of the library and the role of the supervisor. These issues are discussed in Section 5.4.1 and Section 5.4.2 below:

### 5.4.1 Issues related to the role of the library

Several observations emerged from the data related to the use of the library. These are presented below.

#### **For the first stage:**

- There is a relationship between the availability of the supervisor as an information source in helping build the proposal and the low use of the library (Section 5.3.1.2, information sources and resources).
- There is a relationship between the students' negative feelings towards the library staff in the first stage and the low use of library resources and services (Section 5.3.4.2).
- There is a relationship between the growing attitude towards building a research-related personal collection and the increasing use of the library (Section 5.3.4.3).
- There is a relationship between the students' uncertainty about which important information sources need to be used and their low use of the library (Section 5.3.2.1).

**For the second stage:**

- There is a relationship between the demand to complete the research project or thesis and an increased use of the library services (Section 5.3.1.2, information sources and resources).
- There is a relationship between the supervisors' recommendations in developing students' positive feelings towards the library services and the increased use of the library (Section 5.3.4.2).
- There is a relationship between the high dependency of the students' on their personal research collection in the second stage and their low use of the library services (Section 5.3.4.3).

**For all stages:**

- There is a relationship between the problem-solving nature of the topics and a high demand for EIRs (Section 5.3.1.2, the nature of the design process, stages 1 and 3).

***Availability issues***

- There is a relationship between the inability of some students to be on campus in the daytime and the low use of the library services (Section 5.3.3.1, students' availability);
- There is a relationship between the library hours and the use of the library by the students (Section 5.3.3.1, library hour's availability);
- There is a relationship between the low availability of library remote access and a low use of the library (Section 5.3.3.1, availability of library resources and services);
- There is a relationship between the availability of Internet resources externally and the low contribution of the library in supporting research (Section 5.3.6, Google search engine).

***Accessibility issues***

- There is a relationship between poor access to library resources and services and a low use of the library (Section 5.3.3.2, access points and invalid e-journals database subscriptions);
- There is a relationship between the library's restrictions on the accessibility of its resources and services and a low the use of the library (Section 5.3.3.2, library thesis restrictions);

- There is a relationship between the low use of the university library and high accessibility of professional library resources (Section 5.3.6, non-university libraries).

#### ***Performance of library services***

- There is a relationship between the poor performance of library services and a low use of library services by the students (Section 5.3.4.1, stage 1, 2 and 3).

#### ***Promotion of library services***

- There is a relationship between the degree of promoting library services and a low use of its training services (Section 5.3.5.1, promotion of services);
- There is a relationship between the degree of promoting library service and the role of the supervisor as an information skills trainer (Section 5.3.5.1, supervisor support);
- There is a relationship between the development of the students' information awareness and their use of the library (Section 5.3.2.1, stages 2 and 3).

#### ***Training and support***

- There is a relationship between the low training support the library provides and the students' use of their personal training methods to improve their information skills (Section 5.3.5.1, students' self-training);
- There is a relationship between the students' dependency on the supervisor as an information source and the low use of the library resources and services (Section 5.3.6, the supervisor);
- There is a relationship between the high need for information from experts in the field and a low use of the resources provided by the library (Section 5.3.6, specialists in the field).

#### ***Financial adequacy***

- There is a relationship between the degree of student ability to buy the resources needed and a low use of the library (Section 5.3.7.1).

These observations need to be compared with those of other three disciplines. Only the most important will be discussed further in Chapter 9.

## 5.4.2 The role of the supervisor

The most important issue that emerged from the analysed data is the role of the supervisor, which is a unique characteristic of this case study. It was found that the supervisor in this field plays a considerable role as an information provider and information skills trainer. In addition to his commitments as an academic tutor, he provides the students with all the necessary support for their research, including choosing the topic (Section 5.3.1.1), supplying them with different types of information resources (Section 5.3.1.2) and teaching the required information skills (Section 5.3.5.1). The dominance of the supervisor's supporting role over the library's role has made students dependent on the supervisor as an information source rather than on the library:

*'To tell you the truth, everything depends on the supervisor...he is the one who guides...what to do and where to go...He taught me how to carry out a search on a specific topic...he is the one who helped but I did not seek anyone's help from the library'. (EED1)*

It can be argued that students in this field trust their supervisor's specific knowledge and experience in their subject area more than they trust the librarian. This may be because they have no faith in the knowledge of the library staff. Therefore, they tend not to rely on the library when conducting their research. As they are busy in the lab, the supervisor is readily available and easy to access as a source of information outside the university library (Section 5.3.6):

*'The only one I sought help from was my supervisor...he was the one who supplied me with all the papers I needed'. (EED12)*

It can be debated here that this low use of the library might be linked to the supervisor's behaviour in terms of providing the students with the required information resources to complete their entire project or thesis. The supervisor's behaviour might be related to his personal attitudes, the culture of the discipline, the students' culture or other factors. In this regard, in the conclusion the researcher will suggest further research to investigate to what extent the graduate students depend on their supervisors to complete their final project. The supporting role of the supervisor in this field may negatively affect the relationship between the library and the graduate students in the earlier stages. As the supervisor is always available to fulfil their information needs, they do not need to interact with the library to carry out their research. However, the recommendation of the supervisor to use the library resources and services in the later stages may affect the role of the library positively. Consequently, greater

co-ordination between the faculty and the library is required in this field to enhance the supporting role of the library for research.

## 5.5 The social organisation of the electrical engineering field and information use and behaviour

This section discusses the cultural characteristics of the electrical engineering field based on Whitley's two concepts of 'mutual dependence' and 'task uncertainty'. The cultural identity of this field and its relationship with the information use and behaviour of the graduate students is presented in Sections 5.5.1 and 5.5.2.

### 5.5.1 Cultural identity of the field

Graduate students in this field portray their research culture as being orderly and coherent. The research problems and goals are visible, with centralised control over the research to produce predictable results. This is closely aligned with Whitley's (2000) description of the social organisation of fields that have a low degree of 'strategic uncertainty', as their research topics, problems and procedures are well understood and the results are reliable. For example, students in this field identified their research problem through the education and training gained from their Master's modules:

*'Well, I knew my topic already. Before...I agreed on the topic with the supervisor, before registering for the dissertation...'* (EED10)

This issue reflects the fact that some students in this field are already familiar with the research problem they are going to examine as they build their personal knowledge about it through their Master's modules before they start their research project. In addition, they depend on their supervisor's specific knowledge to understand their research topic:

*'A supervisor has sufficient knowledge about the selected topic, which reduces the possibility of conflict.'* (EED3)

In this case, the students are familiar with their topic and are also confident about the follow-up research processes:

*'I based the creation of the design on my previous knowledge, which I gained from the module I mentioned earlier. Also, I knew which software I should use to complete the simulation.'* (EED4)

The increasing of technical control over the knowledge and research procedures has encouraged researchers to rely more on their specialist colleagues (Whitley, 2000). Therefore, in this field, the students are highly reliant on a particular group of colleagues, including their supervisor, for acquiring and accessing the necessary information resources to carry out their research:

*[...] my supervisor provides a great supports and he has an answers and information for every matter.... To be honest in our department this is what is happening I mean most of the students depend on their supervisors to supply them with the materials’.*

*(EED3)*

The participants in this field characterise themselves as being heavily dependent on their supervisor and other professionals in the field to carry out their research:

*‘All I need to do is discuss the results I obtained with my supervisor to check if the results I obtained make sense or not... another professor who has more knowledge on my topic who might advise me to apply a specific method to gain better results.*

*(EED5)*

This fits with Whitley’s (2000) descriptions of the social organisation of the intellectual field, which has a low degree of ‘technical uncertainty’ (see Chapter 2, Section 2.6.2.1), as the students are highly reliant on collaborative work to achieve collective goals. This may be accompanied by high degree of ‘mutual dependence’ (see Chapter 2, Section 2.6.2.1). Accordingly, this field is characterised as having a high degree of ‘mutual dependence’ and a low degree of ‘task uncertainty’. The social organisation of this domain is tightly structured, leading to an increasing level of co-ordination and control within the specific field and across the discipline (Whitley, 2000). This has enabled the discipline to develop a standardised research process and consequently technical standards for communication via digital resources.

### **5.5.2 Disciplinary shaping of information use and behaviour**

In this field, a centralised approach can be observed in using information and shaping the information behaviour of the graduate students. As Whitley (2000) argues, decreasing the degree of ‘task uncertainty’ enables researchers to communicate effectively within a short space through a standardised system. Therefore, this field is characterised as having a centralised field-based communication system via digital resources. The high degree of ‘mutual dependence’ plays a central role in shaping the use of e-resources (Fry and Talja, 2007). This

may shape graduate students' preferences in this field to access and use e-resources more than print ones. Because of the high specialisation of research in this field (high 'functional dependence'; chapter 2, section, 2.6.2.1), a centralised field-based digital resource (i.e. the IEEE database), is the main information channel used by the students to access information. However, low 'technical uncertainty' is likely to be associated with high standardisation of technical procedures that produce visible and predictable results (Whitley, 2000); therefore, articles are often used to communicate research results in this field more than books. This means that e-journals are the major information resources used by students in this field to carry out their research. The high degree of 'strategic dependence' in this field (chapter 2, section, 2.6.2.1), has caused students to be reliant on their supervisors for acquiring and accessing the necessary information resources to carry out their research, and this negatively affects the use of the library as an information source.

## **5.6 Key characteristics of the electrical engineering field**

According to the analysis of the cultural characteristics of this discipline and based on Whitley's two key concepts, this field can be characterised as having a high degree of 'mutual dependence' and a low degree of 'task uncertainty' that shape the information use and information behaviour of the graduate students. These characteristics are discussed further in Sections 5.6.1, 5.6.2, 5.6.3 and 5.6.4.

### **5.6.1 Characteristics related to the culture of the discipline**

According to the culture of this discipline, several characteristics can be observed that shaped the information use and behaviour of the graduate students:

- The high degree of 'mutual dependence' shapes the students' dependence on their supervisor for accessing and obtaining information and their preference to access and use e-resources.
- The low degree of 'task uncertainty' has enabled this field to communicate information via centralised field-based digital resources; therefore, students in this field prefer to access and use e-resources more than print ones.
- The main e-resources preferred by the graduate students in this field are e-journals.
- The high degree of specialisation in this field demands using centralised field-based international databases; therefore, graduate students prefer to access and use the IEEE database to fulfil their information needs.



- The nature of the design in this field controls the types of resources used by graduate students, such as design software, that are not provided by the library.
- The research culture of this field, which is based on lab work, results in the students preferring to access the library remotely rather than physically.

### **5.6.2 Characteristics related to the role of the supervisor**

The high degree of ‘mutual dependence’ causes the students to be more reliant on their supervisor for accessing and obtaining information and therefore the role played by the supervisor in this field has great impact on the information use and behaviour of the graduate students:

- The supervisor’s role as information provider and information skills trainer makes the students dependent on supervisor support and not on the library in the earlier stages of research.
- The supervisor’s recommendation to use the library resources and services in the later stages of research causes the students to develop a more positive attitude toward the library.

### **5.6.3 Characteristics related to the Engineering Library**

Additional issues related to the library resources and services that affect the information use and behaviour of the graduate students include:

- The limited remote availability and accessibility of e-resources causes the students to depend on the Internet (e.g. Google) to carry out their research.
- The lack of access to subject-specific databases (IEEE) due to subscription issues leads the students to be more reliant on their supervisor to acquire information resources.
- The ease of access and availability of alternative information sources outside the university library makes the students in this field reluctant to use library information resources.
- The inability of the library to market its services to the students effectively causes the students to depend on their own self-training and their supervisor’s support.

#### 5.6.4 Characteristics related to the engineering students

Not only do cultural characteristics have a great impact on the information use and behaviour of the graduate students, but the students' characteristics also have an impact on their relationship with the library.

- Graduate students in this field prefer to access and use library digital resources more than print ones.
- The students' negative attitudes towards the library resources and services make them avoid using it to carry out their research.
- The students' awareness about what information sources they need to use, influences their interaction with the library, and this develops throughout the research process.
- The limited ability of some students to be on campus during the day (part-time students) makes them dependent on external information sources to carry out their research.
- Cultural issues, such as adequate finances, encourage the students to buy the information resources they need, which negatively affects their use of the library. The diagram below (Figure 5.1) illustrates the main characteristics of the electrical engineering field, as suggested by the interviews that have been summarised in this chapter.

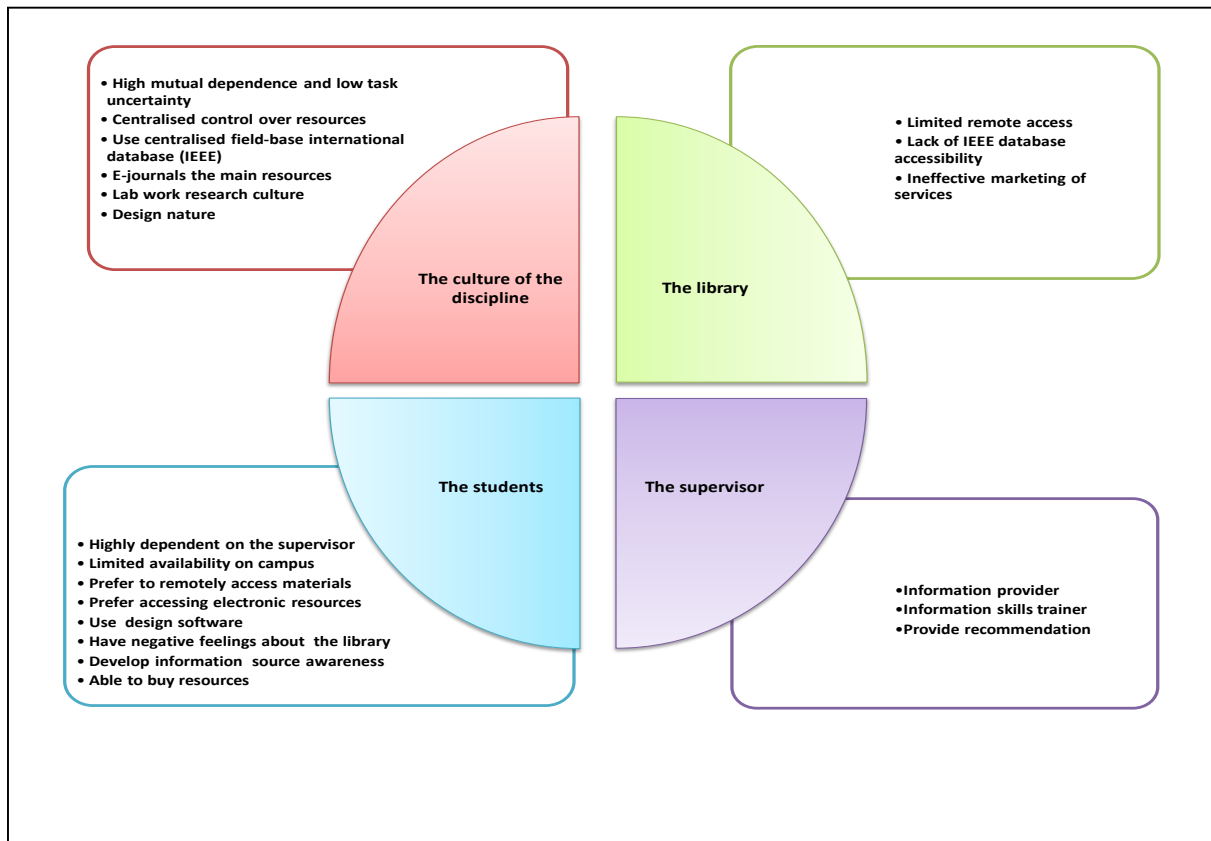


Figure 5-1 Key characteristics of the electrical engineering field at Kuwait University

## 5.7 Overall summary

Several factors were identified that affect the information use and behaviour of graduate students studying at KU, such as the nature of the discipline, information needs, study mode, students' personal experience, library information services, external sources and financial adequacy. These are in addition to the research stages, which appear to be an interacting factor affecting graduate students' use of the library. The nature of the discipline controls the design tasks and the types of information resources to be used, such as design software (which is not provided by the library). The students' awareness about what information sources they need to carry out their research influences their interaction with the library, and this develops throughout the research stages. The limited availability of the participants on campus and accessibility of the library off campus makes the students dependent on external information sources rather than on the library. Students' negative feelings and attitudes towards the library staff make them avoid using the library to support their research in the earlier stages. The low performance of the library services from the participants' perspective combined with the ability of the students to buy the resources needed affects their use of the library negatively.

The cultural context of this field was identified as an important factor that influences the information use and behaviour of the graduate students. As there is a high degree of ‘mutual dependence’ and a low degree of ‘task uncertainty’, digital resources play a central role in electrical engineering graduate students accessing and using information to carry out their research. This is in addition to their high dependence on specialist colleagues, such as the supervisor, for acquiring and accessing information. It seems the supervisor in this field takes over the library’s role and acts as an information provider, supplying the students with all the necessary support, including selecting the topic, providing different types of information resources and teaching the required information skills. The supervisor’s behaviour also plays a significant role in shaping the information use and behaviour of the students in this field. Students are characterised by their high dependence on their supervisor to complete their research.

The research culture of this field, which is based on lab work, causes the students to prefer to access the library remotely rather than physically. Therefore, there is a recognisable lack of communication between the library staff and students. The general image of the library for most of the participants in this case study seems to be negative because the library does not market its services to the students effectively. Students’ trust in the library services is therefore negatively affected. The library can be the third or sometimes fourth option for finding information, whilst supervisors and Google are ranked as the top two options.

Given the small sample size, many of the observations would need to be supported by evidence from other fields or by more data in order to formulate research hypotheses to be tested in further research to explain the relationship between the library’s supporting role and the factors identified. These hypotheses can act as the research contribution to facilitate our understanding of the complex set of interacting factors influencing the pattern of library use and the dominant supporting role of the supervisor in this field.

Improving the library’s role in supporting electrical engineering students’ research process probably depends on its ability to promote its services, improve the current digital systems, address other weaknesses and focus on what the cultural context of the electrical engineering field entails to satisfy the information need of the students.

## CHAPTER 6 – SCIENCE DISCIPLINE/THE MICROBIOLOGY FIELD

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### 6.1 Introduction

This chapter presents the findings of 12 interviews conducted with microbiology graduate students studying at KU to investigate their perceptions regarding their use of the library and information resources throughout their research process. All the interviews were digitally recorded to be analysed qualitatively. The average duration of each interview was between 45 and 75 minutes. The data gathered from the participants were transcribed and translated from Arabic into English. Once the process of transcribing and translation was completed, the coding procedure started, as described in Chapter 3 (Section 3.11.2.2). The findings from the analysis are presented using direct quotations from the participants' responses.

The chapter begins by presenting the characteristics of the interviewee sample (Section 6.2), followed by a discussion of the analysis of cultural characteristics of the discipline at each stage of research (Section 6.3). Each cultural aspect is discussed separately in the following sub-sections: the nature of the discipline (Section 6.3.1), information needs (Section 6.3.2), study mode (Section 6.3.3), students' personal experiences (Section 6.3.4), library information services (Section 6.3.5), external information sources (Section 6.3.6) and financial adequacy (Section 6.3.7). Next, the emergent issues related to microbiology (Section 6.4) are presented. The disciplinary shaping of the information use and behaviour of graduate students is discussed (Section 6.5), followed by a discussion of the key characteristics of the microbiology discipline (Section 6.6). The chapter ends with a summary overview of students' perceptions of the college library's role in supporting their research (Section 6.7).

### 6.2 Characteristics of the interviewee sample

The participants were students from the Department of Biological Science/Microbiology at KU (College of Science). They were required to present their research in the form of a thesis. All the students who participated in this case study were females and were enrolled as full-time students. For the purpose of the analysis, the candidates were selected purposefully from three different groups in terms of the stages of their research: the first group encompassed students who had completed their proposal and were ready to start their actual research; the second group encompassed students who had already embarked on their actual research and were in

the process of writing up their thesis; and the third group encompassed students who had already submitted their research.

Consequently, the findings of this case study were divided into three main stages:

- Stage 1: the proposal development stage;
- Stage 2: the mid-stage (collecting and analysing data, presenting the results and writing up);
- Stage 3: students' reflections on their experiences throughout their research process.

Therefore, an equal number of participants were selected to represent the following stages:

- Four students in the proposal development stage;
- Four students in the data collection, data analysis and writing up stage;
- Four students in the reflection on experience stage (students who had submitted their research work successfully).

### **6.3 Analysis of the cultural characteristics of the discipline at each stage of the students' research**

The purpose of this section is to present the cultural identity of biological science within the specialism of microbiology and how this shaped the participants' use of the library. According to the discussion in Chapter 3 (Section 3.9.2), each subject area had a particular cultural identity. Therefore, the cultural identity factors identified in Chapter 3 (Sections 3.11.2.2) are highlighted, based on the social and intellectual interaction of the microbiology graduate students with the library resources and services throughout the various stages of their research. In this section, the cultural characteristics of the discipline in each research stage are presented, supported by evidence from the collected data.

#### **6.3.1 The nature of the discipline**

This section discusses two elements that are part of the nature of the discipline, topic selection and the nature of the topic (that entails experimentation). The relationship between these two elements and the use of the library and its information resources throughout the research process is presented in Sections 6.3.1.1 and 6.3.1.2.

### 6.3.1.1 Topic selection

To graduate with a Master's degree, biological science students are expected to successfully complete a thesis only. Microbiology students are expected to complete lab-based courses in preparation for their thesis. All students must select a topic that is approved by their supervisor. They must develop a proposal comprising the initial results of a pre-experiment that they have conducted on the topic and submit it to the CGS Committee for approval. This element of cultural identity is discussed for each stage of the students' research below.

#### Stage 1: Proposal development stage

An examination of the interview data indicated that microbiology students selected their topic based on the following issues:

- **Module-based selection:** One of the students in this stage adopted this perspective, as she based her selection on practical experience with the topic gained during the Master's programme, when she completed a mini-project to fulfil the requirements of the academic modules. This student chose her topic because she was familiar with it and was confident and the follow-up research. The student stated:

*'I carried out a mini-project to study the petrol microorganism ... then I gained an encouraging result so I decided to extend the same topic to be the focus of my Master's thesis. To complete the proposal, I had to search for articles about the same topic and I read previous studies to learn about their results; when I felt confident that I could discuss the topic with the supervisor, I met him to gain his agreement'. (MCD4)*

This student chose her topic based on the successful results achieved with the mini-experiment she conducted during the Master's modules. However, to get her supervisor to agree, she had to undertake intensive background reading about the results of similar studies. This required the student to conduct a literature search and use the library resources and services.

- **Supervisor-based selection:** Four students, two in the first stage (MCD2 and MCD3) and two in the final stage (MCD10 and MCD11) confirmed that they counted on their academic tutor to decide their topics. Most commonly, the supervisor suggests more than one topic and the students chose the one that most interests them. One of the student commented:

*'My supervisor suggested more than one topic and then I had to select one. I selected the one which I was interested in more; the one which I can understand and enjoy more... When he provided his suggestions, I asked for extra time to do my reading... Before you select a specific topic you should have a sufficient background about it... I should be interested in it and I must make sure there are adequate information resources and research papers.'* (MCD3)

Students reported the same issues that appeared in the first stage (proposal development stage) in the final stage.

The topics were selected based on their supervisor's suggestions, but the students had the choice to select one of the options proposed by their supervisor. One student described her experience as follows.

*'Two of my tutors introduced the topics to me and both of them are experts in oil and extreme environmental issues. I selected the one which I am interested in.'* (MCD10)

Before the student made the final decision about the topic, she needed to undertake some background reading. Although her supervisor suggested the topic, searching for information resources about the topic was the student's responsibility. According to another interviewee, her supervisor did not supply her with information resources about the topic but persuaded her to do background reading.

*'Interviewee: I met my supervisor and we agreed together on the topic. She suggested the topic and I agreed on it to be my focus ... She suggested two different topics and she asked me to perform some reading and then I selected the one I was more interested in.'* (MCD2)

Another student in the final stage described her experience about the background reading to make her topic selection decision, as follows:

*'I had to carry out a heavy search to find the information I needed to select and understand the topic. Of course, I needed to search for information published in different types of information resources and the focus was on those which included information related to my topic.'* (MCD11)



- **Literature-based selection:** One of the participants in this stage indicated that she adopted this approach. She depended completely on searching the literature first to decide which topic to study. She stated that she chose the topic after searching the literature and reading about the topic.

*Interviewee: I selected what I am interested in; we have in our field two options for choosing our research topic: either medical or environmental... I am more interested in human health and what is related to human health: for example, air, water, food and so on. I know that in Kuwait, specific attention is paid to food issues which have been studied well.*

*Researcher: How did you know about this?*

*Interviewee: I did background reading about it.*

*Researcher: This means at the beginning?*

*Interviewee: Yes, and I have read the important studies conducted in Kuwait about food.*

*Researcher: So, you did a literature search?*

*Interviewee: Yes, for example I know from my search that the soil in Kuwait has been subject to many studies.*

*Researcher: How did you know it has been widely studied?*

*Interviewee: I found many papers. Every time I did a search, I found loads of papers written about this topic in Kuwait. After that, I consulted my supervisor and gained his approval of the topic which I am going to study'. (MCD1)*

Concerning the literature search associated with supervisor guidance, one student in the final stage described her experience as follows:

*'I started the initial background reading during the summer and I carried out some searches in the library. Once I agreed with my supervisor on the research focus, he asked me to search for papers that allow me to perform some experiments'. (MCD10)*

- **Multiple methods selections:** In this case, the selection of the topic is made after the student searches and reads about the topic suggested by the supervisor, based on modules interest and knowledge of the topic. One student stated:

*'The topic was selected by my supervisor because I could not find a free, specialised supervisor who was able to supervise the topic I selected. So I was forced to select another supervisor... Although I prepared myself and did a lot of reading during the summer to understand the topic I wanted to study, the lack of academic staff specialising in the topic prevented me from tackling it'. (MCD4)*

She added:

*'He suggested two topics; I think I selected the best one ... when I searched on the Internet, I found that the first topic was common; many research studies in Kuwait had tackled that topic, so I decided to go with the recent one ... As I attended previously a module called petroleum microbiology, I carried out an experiment ... and that was very helpful because the same work I did before will be carried out again'. (MCD4)*

To sum up, four different methods of topic selection were identified. Microbiology students selected their topic based on their supervisor's recommendation, their interaction with the topic during course modules, their own background, reading and searching the literature or a combination of these methods.

From the above analysis, a few issues related to the topic selection are identified:

1. A set of topics was recommended by the supervisor and the student had to select the one that interested her. She made the final decision after searching for information resources related to the topic.
2. The student depended on herself to find the information resources related to the topic that interested her and not on her supervisor in order to do the background reading.

3. The student selected the topic based on searching the literature and interacting with the library to meet her needs.
4. The supervisor did not supply the student with the information resources but persuaded the students to search for the information resources related to the selected topic and to do the background reading.

Concerning the topic selection element, students need to have sufficient background about a topic before they can make a decision about which topic to choose for their research. The topic is often suggested by the supervisors who direct the students to search the literature for the relevant information. Even if the topic was not suggested by the supervisor, the students have to search for the necessary information.

### **Stage 2: Mid-stage (data collection, data analysis and writing up)**

The role of the library in this stage vis-à-vis topic selection was not mentioned, as the decision about the topic was already made.

### **Stage 3: Reflections on student's experiences**

Based on the participants' experience, a set of issues that influenced topic selection and shaped the demand for library resources and services, in turn influencing the library's supporting role was identified.

- The library services and information resources are used more when students need to carry out background reading and search for relevant information resources to make the final decision about the topic. As one student reported:

*'To create the required fresh background, I must read the up-to-date information on my topic... Anyway, Kuwait University library subscribes to many databases related to my field. If I need a soft copy of an article related to my topic, it will be easy to access it. I can use e-journals and access it via the university library website and get what I need'. (MCD1)*

- The library services and information resources are used more when the students are encouraged by their supervisor to search for the information resources required to choose a topic. As one student commented:

*'I consulted my supervisor, who has extensive experience in the topic, as she has done plenty of research. She gave me a brief idea about the topic and then I had to carry out more searches to learn more about my topic... I used the Internet in the library to find information... sometimes; I would spend over six hours in the library searching for information'. (MCD2)*

- The library services and information resources are used more when students are more independent in selecting their topic through searching the literature and making their own decisions in terms of the topic. One student stated:

*'I searched for the required information by myself and I found most of it published in the journals. I accessed the library database to find the information related to my topic'. (MCD4)*

Many issues related to topic selection were identified in this case study, and the most common one chosen was supervisor-based selection. Therefore, in light of the findings about topic selection, it can be stated that:

- The less the students depend on their supervisor as an information source, the more dependent they will be on library services (supervisor-based selection).

### **6.3.1.2 The nature of the topic**

According to the examined data of this case study, the nature of the topic is influenced by the experimental nature of the discipline that in turn influences the type of information sources to be used. These two issues will be discussed as they relate to the research stages, as follows.

#### **Stage 1: Proposal development stage**

Biological science students in general and microbiology students in particular are expected to perform experiments as a key element of their research. Therefore, they have to identify a topic that enables them to apply scientific principles and creatively modify experimental procedures to achieve successful results. The analysed data of this case study shows that the experimental nature of the topic influenced the use of the library by the graduate students, as follows.

- **The experimental nature:** This involves carrying out an initial test in the lab to check the validity of the experiment for application prior to making a decision in this regard. The students in this case need to collect information about the experiment, such as how to

conduct it (e.g. the procedure) and what materials and devices they need. This demand influences or shapes the role of the library. One student commented:

*'Before doing the experiment, we must read carefully and in depth about the studied topic. We should read what others have done and what their ideas were. I must read carefully because I do not want to repeat what they have done. I should not follow the same process; I should find my own way, and a different method of application ... I used some older books in our library that discussed some issues related to health science. I used them to understand the methods'. (MCD1)*

Another student commented:

*'I should visit the library to search for previous dissertations which studied the same or similar topic in Kuwait. I should study the research methodology used in the dissertation to see if it can be a possible candidate. You know if it has been used by the student which means the required materials are available in the university because the study was conducted in the Kuwaiti's context. Therefore, when I did the reading I consulted the previous dissertations and I informed my supervisor that I was willing to apply the same methodology in my dissertation'. (MCD3)*

From the evidence above, the experimental nature of the topic means the demand to use the library is high, as the students needed to read older books or previous dissertations to acquire background information about the methods they could apply or the materials needed to conduct their experiments.

- **Information sources and resources used:** The students tended to seek information sources and resources that are readily available and that meet their information needs. As Master's students in the Microbiology Department are not allowed to register as part-time students, they are available during the day time to visit the library. The findings of this research show that all students tended to use:

**1. The College library:** In order to perform the background reading about their topic and develop their research proposal, microbiology students' main source of information at this stage was the library.

**Information resources:** Students at this stage used the various information resources provided by the library to acquire background knowledge of their topic. The examined data of this case study reveals that microbiology students tended to use:

**Books:** All the respondents at this stage confirmed that they used textbooks and edited books as a source of information to complete their proposals.

**a. Textbooks:** These are the books the students usually use for the Master's courses. One student in the proposal development stage stated:

*'I used textbooks as well, to understand the principles... If I needed basic information, I will find it in the textbook, I can find and use definitions and basic information. I cannot use much information from it because the information is subject to change. Therefore, textbooks can only be used to gain general information such as definitions'. (MCD3)*

**b. Edited books:** These books contain more than one article and each chapter is edited by a different author. Another student in the same stage commented:

*'I used edited books which included in depth information unlike textbooks which present only general information... I read chapters in edited books and I used the information published in them to write the background'. (MCD2)*

**Existing theses:** The students also needed to use the thesis collection to acquire knowledge about the methodology used for their topic. The library allows students to use this collection inside the library. One student reported:

*'I searched also for theses that had been completed by previous students and were stored in the library... I searched for them on the shelves directly; the library specified individual locations for each subject so I searched on the shelves where the theses in my subject area were located'. (MCD2)*

The microbiology students used existing theses in the same field to understand the methodology and to find references relating to the methodologies in the same area of their research. Another student stated:

*'I searched the dissertation for information. Yes, I read a dissertation, previous student dissertations; they helped me understand the methodologies... The dissertations themselves were useful for gaining more references; it helps in selecting more references. It will direct you to additional papers.' (MCD3)*

**E-journals and software:** In this stage, all the students confirmed that they used a specialised database, such as Science Direct, to obtain the e-journals they needed. They also used the software library to complete their proposal. One student stated:

*'I searched for articles published on the databases provided by the library such as Science Direct ... e-journals are my favourite information resource because the information published in them is trustworthy and provides details about the experiment, so I always feel satisfied with the type and amount of information provided by the academic journals'. (MCD2)*

Another student commented:

*'When I prepared my proposal I searched and read many articles ... I examined many papers to see if the results I might gain would be valid. I used the calculation method to calculate the results emerged from the lab device. The same device has a CD library ... which helps me recognise the types of the microorganism'. (MCD4)*

**ILL services:** Students in the microbiology field sometimes chose a topic rooted in the medical or health science domains. One of the interviewees confirmed that when she could not access this type of information, she used the ILL services. She stated:

*'Some papers I can access, those I cannot access I will request them from the medical library. The Health Science journal is available there, and I make a request ... I will make a request to the Science Library which is in turn sent to the Medical Library, and wait for the response'. (MCD1)*

**2. The Supervisor:** For most of the microbiology students in this case study, the demand for the supervisor as an information source was the second most popular option after searching the library. According to one student, she used her supervisor's support when she had done her best to find the information resources needed:

*'He [her supervisor] asked me to visit the library to search for information resources which are related to this topic. He told me 'go and search in the library and I am confident that you will find the required information'. He said 'you will be looking for basic information which should be available in most biochemistry books'. I spent around 10 days searching and browsing the biochemistry books one by one ... By chance, I found a book and then my supervisor supplied me with 2 extra books'. (MCD3)*

**3. Specialists in the field:** Not only do the students seek their supervisor's support but also use other professionals in the field to provide them with information about the possibility of their experiment application. As one student commented:

*'Because my topic is related to the medical area, I have spoken to doctors. I went to hospitals and visited the Microbiology Department; I asked the staff and learnt from them how to conduct specific experiments ... I wanted to make sure that I could apply my experiment in the environment of Kuwait. I needed to know whether the materials related to the experiment were available or not'. (MCD1)*

Another student sought the recommendations of professionals in the field about the originality of her topic. She reported:

*'I sought some advice from professors who work at KISR as they are familiar with the topic. So they provided me with different advice and encouraged me to tackle the topic because only one MSc student had investigated it before'. (MCD4)*

To sum up, the students were required to conduct an initial experiment to develop their proposal. In order to meet this demand, they spent a long time at the beginning searching for various resources in the library, including text books, edited books and dissertations. They believed that the quality of information needed was very important. Therefore, they used textbooks for general basic information and edited books for detailed information. They had great awareness regarding the authenticity of the information needed and therefore used online databases and e-journals for more authentic information. They believed that e-journals would meet their information needs at this stage because such resources provide up-to-date and recent information. The students also read existing dissertations to understand the methodologies and to find more references relating to their topic. Some students used their supervisor to supply them with the necessary resources that were otherwise unavailable to them. Other students had to use professionals in the field as a source of information to make sure that their experiments were applicable.

### **Stage 2: Mid-stage (data collection, data analysis and writing up)**

Regarding the nature of the topic, the data analysed revealed that during the second stage this issue does not influence or shape the role of the library, as the students checked the originality of their topic and validity of their experiment in the first stage. This was mentioned by all students interviewed for this case study.



- **Information sources and resources used:** In this stage, the students tended to manage the data collected about their topic in the first stage to build their experiment procedure. Using different lab materials and devices for the application of the experiment demands a high level of information from experts in the field. Accordingly, the examined data showed that all students tended to use:

**1. Their supervisor:** For all the students (MCD5, MCD6, MCD7 and MCD8), the supervisor was the main source of information while conducting their experiment for the actual research and generating the expected results. The students needed to consult experts in the field to be able to manage their experiment and finalise their results in addition to searching the literature. When asked if she consulted anyone except the literature, one student stated:

*'I requested ... support from my supervisor ... to explain the issues to me and the information I could not understand ... My supervisor went with me, step by step, and supplied me with a few titles of articles that focused on my topic. I cooperated with the supervisor to find the best method for carrying out the experiment and obtaining the results we were expecting ... I searched in the library using either Science Direct or Google Scholar'. (MCD8)*

Not only the supervisor but other professionals, such as other academic staff or lab technicians, are needed at this stage. One student stated:

*'Personally, I depended mainly on the articles ... and I will consult my supervisor who has enjoyed long experience with the experiments. By the way, on many occasions, my supervisor encouraged me to carry out discussions with other people [lab technicians] to increase my understanding of the results and to feel more comfortable with my outcomes considering that most of them have had good experience of using different machines such as electron microscopes so they were able to advise me what elements in my results existed and which ones were still missing'. (MCD5)*

**2. Other university libraries:** Students whose topics were related to medical or health science needed information resources from the Health Science Library. They had to visit the library physically to access their collection or request the materials they needed through the ILL service. One student commented:

*'When I was using the microarray, I used the medical library ... because I worked there on microarray and the library was available and it uses the same systems and provides the same services as this library [Science Library], I used Science Direct but accessed it from the medical library and searched for articles. Those I could not access, I went through the inter-library loans service to request them'. (MCD5)*

Another student stated:

*'I checked papers in general science and I used the medical library to search for papers ... because I was unable to access some articles from here [Science Library]. I was able to access full text from there, so I have to visit the library physically'. (MCD8)*

**3. Bioinformatics tools:** These are tools available on the Internet that provide authenticated information about scientific issues related to specific topics. One example is the Gene Bank. Some of the students needed to access these digital libraries to collect information about their experimental results. As one student stated:

*'We need to paste the 'gene sequence' in the Gene Bank to be able to gain the information about our result ... It is a website specifically designed to evaluate the sequence ... We use this website to identify and understand the sequence of many proteins ... As soon as I complete the process, the website will notify me that the results I posted meant X and Y. This can be, for example, Yes, you have mosaic X virus ... We need to search the Gene Bank to see what other publications used and which primers have been involved; then we can select the most suitable one for our project'. (MCD5)*

**4. Other resources:** Various resources were used by the microbiology students according to their experiment needs, such as:

**a. Patents:** Regarding the experiment needs, microbiology students used this type of resource. It is a legal documents pertaining to the rights of inventors available on the Internet and provides information about the patent. Full-text access to patents may be provided electronically by many national patent office's through their websites. According to one interviewee, patents were another resource used by the students during this stage:

*'I used patents ... online, via the Internet. There are different online sites which provide patents in different languages and from different countries. I searched Europe, the USA and a few others'. (MCD7)*

**b. Software:** For all the students in this stage, the first demand would not be the use of the library so much as the use of laboratory tools and software. One student stated:

*'I used the fino-genetic tree software to identity the relationships between different types of bacteria'. (MCD6)*

Another student reported:

*'I used ChemDraw software; I used it to draw the compounds. If I needed to draw specific compounds, I would use it. I downloaded this software'. (MCD7)*

In addition, the students used e-Library in the form of software installed on the devices they used in the lab to conduct their experiment. They used this library to compare their results with the information provided in the software library. As one student reported:

*'Every device we use in the lab has a library as soon as the results became ready and all of the required assessment and calculation were completed, I had to visit the library to match my results and the results stored in the library... Then, the library supplied me with a list which had the names of the fatty acids that have similar results... The library will help me to identify and understand the result'. (MCD7)*

Although the students during this stage mainly use their personal research collections that were carefully chosen and organised and then stored on their own personal devices, it was necessary to conduct further searches to find the best method to carry out the experiment and to gain the expected results. Therefore, they tended to use the library collections and the EIRs more when they were ready to finalise their results and complete their theses.

**Use of reference books:** Because of certain experiment requirements, one student used the reference books in the library. These are books that are used to find information on specific topics. They can only be used inside the library and cannot be borrowed. One student commented:

*'Another information resource helped me to recognise the fat types, which are available in the library is the mass fragmentation books. They called them encyclopaedias, and you cannot borrow such resources. You need to use them inside the library; I used those resources which helped me to recognise the different types of fatty acids of the bacteria'. (MCD7)*

**Accessing the Science Direct database and other information resources:** All the students in this stage confirmed that they used a specialised database in their field, such as Science Direct. According to one interviewee, they used it to obtain the e-journals needed to complete their theses.

*'Well I used mainly Science Direct; I carried out most of my search through it, including the result and discussion'. (MCD5)*

The students also tended to use the print collection when they could not access the e-journals they needed. One student asserted:

*'To me, the most important point was accessing the information and the articles I needed. I mean those articles I was unable to access online; I asked the library for a hardcopy'. (MCD8)*

Another student added:

*'The rest [of the journals] were available in the library as a printed copy. By the way, I learnt recently about this service. Someone [library staff] taught me how to search for the available printed journals in the library and which articles they included'. (MCD5)*

In addition, the students in this stage tended to use the ILL service when they failed to find the resources they needed, either in electronic or print format. The same student commented:

*'I used the same method by accessing the Science Direct database or library printed collection to search for articles and, for those I could not access, I used the inter library loan service to request them'. (MCD5)*

**Comparing the findings to the literature:** Once the students achieved their experiment results, they were expected to compare them with those of similar studies. One student commented as follows:

*'I needed to go back to the main information resources provided by the university library like the mass fragmentation book to understand the results and, of course, I needed to revisit the research papers to see if someone else had reached similar results to mine. I needed to do all the required comparisons until I felt confident about my findings'. (MCD7)*

**Create the literature review:** In order to write their literature review chapter and the methodology section, the microbiology students were expected to search and use varied

information resources. When asked which information resources she used to write the literature review, one student stated:

*'We do not have a literature review, but we have an introduction section, which provides information briefly about the topic including previous studies... I used articles, edited books and review papers... Review papers are useful because they provide information about different authors and the experiments they did briefly. Then if I find myself interested in any, I will have full bibliographical information to search for the article'. (MCD8)*

**Use private study space:** The students at this stage need quiet space when they start writing their theses. They use the library space to do this. One student commented:

*'When I started writing my dissertation, I spent more time in the library, using the study room to complete my research work'. (MCD8)*

**Use of library services:** Students at this stage tended to use some of the library services, such as printing and photocopying, to finalise their dissertations. One student stated:

*'I needed to go to the shelf to find the book, and then I photocopied the parts I needed'. (MCD7)*

The most interesting thing was that although the library provides online services, such as a library catalogue that can be searched both on and off campus, some students indicated that they visited the library to search the card catalogue. As one student reported:

*'My first option was always the card catalogue, maybe because the computers were always busy or maybe because the priority in my mind was the card catalogue'. (MCD6)*

In sum, the students at this stage (the mid-stage) used the library and its information resources for different reasons. In order to finalise their results and complete their theses, they needed to visit the library physically to use the reference collection; access the library database; use the ILL services and use the library catalogue to search for books or articles. In addition, they tended to use the photocopying services and library space to complete the writing up of their dissertations.

### **Stage 3: Reflections on students' experiences**

The same issues that appeared in the proposal development stage were mentioned by the students who were interviewed in this stage.

- **The experimental nature:** The originality of the topic based on experimentation was also identified at this stage by all respondents. One student stated that:

*'I could not find the information I needed here in the library... The library here doesn't have a subscription to all of the journals I required... My topic is very specific and finding very specific information on the Internet about a specific topic is not simple, and I think such articles would not be available in the university library. Because they discuss a very specific aspect of knowledge; not everyone would seek them'. (MCD12)*

According to the above student's experience, the library failed to meet the requirements for her topic. For her, the library was not the main source for recent information on her topic. She searched for specific, more recent information, but the library collection could not provide that.

Another student commented:

*'My topic is quite new and, even if there were relevant information resources available outside Kuwait, I should not expect them to be in the library ... In such a case, I would either search for the paper on the Internet or, if I could not find it, I would request it from the library using the inter-library loan service ... when the library sent a request, for example, to the British Library and the British Library informed them that the requested document is not available in their collection, I felt disappointed'. (MCD11)*

According to the students' experiences, the nature of the topic determined the sources of information they used to meet their information needs. The library was unable to fulfil the originality needs associated with the students' topics. Regarding the nature of the topic, the library was not the main source of information in this case because other sources of information were available to fulfil specific needs.

- **Information sources and resources:** As the students submit their theses, the search for information declines. According to the students' experiences at this stage, the use of information resources will be subject to updating their information in preparation for their viva. As one student commented:

*'Of course, after submitting the thesis, the amount of searching for information required reduces but I did not stop searching and using the information resources, as I needed to update myself with the most recent information before the viva to be able to defend my thesis and be ready for the examiners' questions'. (MCD11)*

To sum up, it can be inferred from the students' experiences above that the nature of the topic determined the type of information sources and resources used. The experimental nature of the discipline has an influence on the nature of the topics the students selected, and this influences the type of information sources used. In addition, the demands of the tasks they performed in each stage affected which information sources they used to fulfil their needs.

Finally, and corresponding to the evidence provided regarding the nature of the discipline, it can be stated that:

- The library information resources will be used more to build the proposal, as few other sources of information, such as the supervisor, are available (stage 1).
- The more demand there is to complete the research project or thesis, the more the library services will be used by the students (stage 2).
- The more original and experimental the nature of the topic, the more EIRs the students will need (stage 1, stage 3).

### **6.3.2 Information needs**

In this case study, the information needs of the students, as identified from the data, consisted of the need to use specific sources of information to complete their research. Information skills capability was the only cultural element identified that shaped the information needs culture. This element is discussed below.

#### **6.3.2.1 Information skills capability**

Students' information skills capability has an influence on their interaction with the library. The students' ability to seek, access, search, evaluate and use specific information sources to fulfil their needs reflects their information skills capability. As the students' research progressed, so their information skills capability developed. This element as it relates to each research stage is discussed below.

##### **Stage 1: Proposal development stage**

The students in this stage need to make a decision about their research topic. Therefore, they have to understand the topic, which requires them to carry out background reading. As the students' first need to understand the experiments involved, they need to search for information sources that provide them with general information. One student commented:

*'At the beginning...I used Wikipedia to read only but I did not use any information from it to build up the proposal because it is not authenticated. Wikipedia information is easy to understand; it was written in a simple way ... I searched for papers on the Internet, those published in journals. I accessed a few university websites. On many occasions, I was able to find important information about my experiment published as lectures'. (MCD2)*

The students in this stage used any source that was readily available to find information related to their topic. Usually, they began by searching the Internet using Google, as it is easy to access, searchable and readily available. As the students were uncertain about what specific information they needed, they used a general information source such as the Internet. However, the students in this stage are able to identify the reliability of the information provided in the source in terms of whether it is authentic or not. After they carried out more searches, their information skills capability developed in order to meet their information needs. One student stated:

*'At the beginning, I did not know which databases I was supposed to use and which included more articles on my topic...I kept trying until I found my way. I tried more than one database to check which one might be the best and include more accessible articles related to my topic'. (MCD3)*

Practising searching for information sources and evaluating the sources enables students to identify the most important ones relating to their specific topics, in addition to the recommendations of their supervisor. One student stated:

*'My supervisor advised me to ask in a Kuwait institute for scientific research about my topic because he knew that many people there carried out similar research to mine. When I asked, I found there much information about my topic'. (MCD4)*

It seems that uncertainty about the type of information needed increased the search for the important sources. However, the students' information skills capability improved when the supervisor directed the student towards the appropriate information sources. In other words, the less information skills capability the student developed, the less library resources and services will be used.



## Stage 2: Mid-stage (data collection, data analysis and writing up)

As the students became involved in their experiment, they became more focused and their information needs became more narrow and specific. Therefore, they became more capable of deciding what information sources they needed to use to search for authentic information. One student commented:

*'To start my experiment, I need to collect my samples and allow growth...We should do testing and extraction for all samples before I do the actual experiment...I was looking for articles. I used Google Scholar to search for articles which discussed similar studies'. (MCD7)*

Again, the recommendations of the supervisor about what information sources are needed help build the students' information skills capabilities. One student commented:

*'I used Google images...to compare my photos or to understand the photos I could not understand. My supervisor recommended that I searched Google images to understand doggy photos'. (MCD8)*

Another student who was writing up her thesis commented:

*'In the discussion, I should compare my results with the literature...To complete the discussion, I used recent papers that were available on the library database (Science Direct) and some are available as a hard copy'. (MCD7)*

From the discussion above, it seems that the students' information skills capabilities developed as their research progressed, and they became able to identify which types of information sources they could use in relation to the demands of each task they performed. The more information skills capabilities they develop regarding the specific information source needed, the more library resources and services will be used.

## Stage 3: Reflection on the students' experiences

Concerning the students' own experiences at this stage, the same issues that appeared in previous stages were mentioned. The students' information skills capability developed during their research stages. One student commented:

*'At the beginning, I used search engines such as Google to search for the information I needed, as the topic which I'm researching is new, and I don't have any background*

*about it, so I surfed the net and used Google to get general information about the topic. I always read about any new topic on Wikipedia ... After I got the general idea, I used Google Scholar to search for research papers on the same topic'. (MCD9)*

Another student described the development of her information skills capability during the research process:

*'I depended mainly on the Internet, but I was aware that I must use and seek only trustworthy information. In the Master's course, I became very aware that I could not seek information from wherever I wanted; rather, I needed to make sure that the information I sought and used was reliable and valid. In the Master's course, I became able to identify which type of information sources I could use and seek information from ... This awareness increased as the Master's course ran. I mean, I started with a little awareness and then this awareness increased bit by bit as the Master's course came to the end'. (MCD12)*

As the students' research progresses, their information skills capabilities developed and their ability to use and evaluate the library as a main source of information increased. One student stated:

*'The science library had a real influence on the development of my research ... The interlibrary loan service helped me to acquire the papers I could not access so it filled the gap in the library's current collection, bearing in mind that I was able to find in the library one of the very most recent books in the field which I used as a reference until I completed my thesis'. (MCD10)*

To sum up, from the students' experience outlined above, it can be said that information skills capability has an influence on students' interaction with the library's resources and services. Throughout the research process, the students' information skills capabilities developed as the demands of each stage developed to meet their information needs.

Ultimately, based on the evidence provided in relation to information needs culture for each research stage, it can be stated that:

- The fewer information skills capabilities the student develops about which important information sources need to be used, the less frequently they will use the library services (stage 1).

- The more information skills capabilities developed in terms of using the library, the more its resources and services will be used (stage 2).
- Library use will increase as the students develop improved information skills capabilities (stage 3).

### 6.3.3 Study mode

Full-time mode is identified from the data of this case study as a factor that influences students' interaction with the library resources and services but not the research process itself. Two elements related to full-time mode emerged: availability and accessibility. These two elements are discussed in Section 6.3.3.1 and Section 6.3.3.2, respectively.

#### 6.3.3.1 Availability

The availability of the students, the availability of library hours and the availability of library resources and services are three issues that emerged relating to the element of availability. These three issues are discussed below.

- **Availability of the students:** Full-time students were able to be on the university campus during the daytime. Accordingly, they were heavy users of the library resources and services. As part of the library services offered to them was available only from 8:00 am to 1:30 pm, they were able to benefit from them, due to their availability on the campus at this time. Full-time students are more able to access the library physically and use its resources and services. One student in the final stage stated:

*'I used the library's computers to access the websites and papers that were not accessible from home or those which required a subscription or membership. I also used the printing and photocopying service provided by the library, and because I am not a part-time student, I was able to visit the library in the morning and use the inter-library loan services.'* (MCD10)

Although the microbiology students are very busy in the lab, they can visit the library physically when they have free time to search for the information they need. As one student in the proposal stage commented:

*'I will use the Internet to find the required information. Computers are available in the lab so I will search for the information which I need. Even if I am unable to gain*

*everything I need, that is ok, because I will go in my free time to complete my search in the library ... When the papers I need to read are not available as a full text on the Internet, I go to the library to search for them using the library database'. (MCD1)*

One full-time student in the mid-stage confirmed that her ability to be on campus in the daytime enabled her to use the library services:

*'To prepare different climate conditions and to learn how to foster growth under those conditions and to gain a positive result, I needed to read again different and specific articles... Some I accessed via the library, I found the title on the Internet and I went to the library to get a hard copy. Once I found the hard copy in the library, I took a photocopy and took it home with me... the collected information assisted me to create my methodology chapter and then to complete my discussion'. (MCD7)*

As can be seen from the above, the ability of the full-time students to be on campus during the daytime enabled them to use the library and also enhanced their ability to build a relationship with the library. It is important to note that the statement that the more users of library resources and services are on campus the more they will use the services is correct during all the research stages for all the students.

- **Library hours:** This issue is related to the library's hours of operation. The university library hours are normally from 8:00 am to 9:00 pm. Full-time students who are able to be on campus during the daytime can use the library resources and services, but when they are involved in lab work and become busy they have less time to physically visit the library. One full-time student expressed her view about the library hours as follows.

*'I think that, generally, the opening hours are ok; the library closes at 9:00 pm, except at weekends, but the opening time is critical during Ramadan [holy month] because the library opens at 9 am and close at 1:30 pm so there is not enough time to do anything. And also at the beginning of each year, the library opening hours are not very convenient because they are varied'. (MCD12)*

The students believe that the library hours are not long enough to fulfil their needs, particularly during the holy month, and that the library has inconvenient hours at the beginning of the academic year. Another student recommended extending the library hours because the usual ones were not sufficient to meet her needs:

*'I would like the library to increase its opening hours. You know, it is very stressful if a student is searching for information or articles for hours and, when she reaches the results she wants, the security man comes and warns her to leave. It happened to me on many occasions. Once I found the information I needed after a long journey of searching, the security man came and said "Closing time", so I had to return everything and start again next day, if I had the motivation to do so'. (MCD11)*

It seems that the library hours also had an influence on the role of the library in supporting the students' research. Full-time students are on campus even in the evening, as they are busy in the lab working to complete their research. The library should extend its hours so that the students can benefit from its services. In other words, the shorter the library hours, the less the students will use it as a main source to support their research.

- **Availability of library resources and services:** The findings of this case study revealed that a lack of information resources relevant to their specific topic made the students seek their supervisors' support or other alternative sources. One student stated:

*'I needed information about the geology of Kuwait... I found it in the [KISR] library... because I could not find it in this library [the Science Library] and... it is a specialised library that has information resources about the ecology of the sea, and what type of elements Kuwaiti's environment has; and I was able to find back-dated information. I also used articles in the journals published by the Institute of Scientific Research itself'. (MCD8)*

Another full-time student who could not access the information needed through the library database and used other special library databases commented:

*'I used Science Direct, but in many occasions I could not access the full-text articles due to lack of subscriptions ... The library here doesn't have the subscription for all journals I required. At the beginning I only depended on the university's library then I knew that I could access information I needed as well from the KISER library. The library in the institute has access to more relevant articles and information to my topic'. (MCD12)*

When journals are needed to which the library does not subscribe, the students may use their supervisor's support to find what they need. A student reflected on his experience with the library as follows:

*'Sometimes, I found just the abstract of the research paper that I needed, and to get the full text I should subscribe to the database. What is interesting is when the library does not subscribe to that database; in that case, I resort to my supervisor to get a copy of the research paper. If he has the original or has an account for this database, he can provide me with his user name and password and then I can access the database and download the research paper I need'. (MCD9)*

From the discussion above, it can be seen that the students used alternative sources of information because of the lack of availability of some required information resources and because other sources of information were available. All the respondents mentioned the leading databases in their field, such as Science Direct, as one of the most common resources they used to access reliable information. As they were full-time students, their ability to be on campus enabled them to use the library's online services that are unavailable remotely from home. Therefore, the interaction with the library was also influenced by availability, but this time the availability of the library resources more than anything else. In other words, the less available library information resources and services, the less they will be used by the students.

### **6.3.3.2 Accessibility**

The findings of this case study show that the ability of full-time students to be on campus during the day enables them to access the library physically and use its resources and services. While they are working in the lab, they can access the library website through the Internet. Many issues emerged relating to how the accessibility of the library resources and services influence the role of the library. These are as follows.

- **Access points:** Library access points for online resources and services are provided for graduate students only on the university campus. The Science Direct database cannot be accessed off the university campus. According to one student in the proposal stage:

*'We can only access it [the library database] from either the library's computers or from our personal laptop but we need to be on campus... Accessibility is limited to the abstracts only'. (MCD2)*

Although access to the database was provided on the university campus, one student interviewed for this case study confirmed that the access from the lab was restricted only to searching. The students can search for journals while they are in the lab but they need to physically be in the library to access the full-text articles. One student stated:

*'I can search and identify the resource to see if it is available or not, but I cannot access the full text. To get access to the full text, I need to go to the library'. (MCD1)*

Although the microbiology students were able to be on campus, accessing the library from outside the university was preferable in order to save time and effort. If the library provided more remote access points to its online databases, the students would not search for alternative library databases but use its resources and services. One student who accessed another university remotely to get what she needed stated:

*'To tell you the truth, the accessibility to the American university library information resources was easier because I was able to access it from home, but to access the physical papers I had to come to the library and, as you know, students always prefer to search and use information resources which are easy to access from home'. (MCD6)*

- **Invalid remote access:** It is interesting to note that the Science Library launched a remote access point recently for the students when the researcher conducted the interviews with them. Incidentally, the library network is not strong enough to maintain the service in an active mode in the labs due to technical issues. Therefore, the service was restricted only to faculty members in their offices, and the students could not use the service in the labs. One student stated:

*'Last year, the academic tutors informed us that we could access it [Science library] from the department' computers but, in practice, when we asked, the library staff informed me that the service had not been activated yet. That was last year. I am not sure what happened recently but I personally do not think the library is going to activate this service soon.'* (MCD11)

This issue prevented the students from using the remote access services provided by the library at that time because the service was not activated. Another student recommended providing them with information to access the specialised databases in their subject area remotely from home. She stated:

*'Provide us with access information to be able to access the databases such as Science Direct from home'. (MCD12)*

It can be noticed from the above discussion that the more access points provided by the library for its collection, the more the online library resources and services will be used.

- **Library restrictions:** The library thesis collection is not allowed to be borrowed or even photocopied; therefore, graduate students have to use them inside the library. These restrictions on the thesis loan system can influence the use of this type of collection by graduate students. One student stated:

*'To be fair, as a student, I need to take the theses outside the library to enjoy reading them at home. The library has now stopped providing a self-service photocopier. Both the printer and the photocopier are located in locked rooms and students can only photocopy journal papers and articles. Photocopying or printing out the theses is not allowed to anyone, including the academic staff and tutors'. (MCD11)*

Another student expressed her dissatisfaction with the library restrictions on photocopying theses:

*'I was dissatisfied with the thesis photocopying service... because, although previous theses can be great information resources for learning the practical applications of an experiment's methods, we were not allowed to photocopy any part of any thesis. I personally used my personal I-pad to photograph some of the pages I needed but, according to the library's rules, such action is not accepted, but I needed them, so what could I do?' (MCD10)*

Based on the evidence above, as the library places greater restrictions on access to its collection, the less its resources and services are used by the graduate students. It is important to note that the statement that the less library accessibility provided, the less its resources and services will be used is correct during all the research stages.

- **Limited English vocabulary:** Most of the students studying biological science were native Arabic speakers and the main language of instruction used in this programme is English. Two respondents mentioned that they experienced difficulty in interacting



with the library database, as most of the subject-specific databases use English. One student reflected on his experience thus:

*'In the first year, when I used the key word search, I had difficulty in setting the exact key words to get the relevant results, you know, we used English words when searching the database, and English is not our native language. At the beginning, when I set the key word and conducted the search, I got many results which are irrelevant ... Sometimes, I used a dictionary to find out the meaning of the word in Arabic so that I could choose it as a key word for my search. After that and through an intensive reading of the English references that we used in our research, I became knowledgeable on how to define the exact key words and how to find the exact key words in order to get relevant results for my search'. (MCD9)*

According to the intensive reading the students performed in English language to complete their research, their English vocabulary developed. Another student explained:

*'The very early experience was not pleasant because searching, finding and accessing information on the database ... was not any easy mission to be tackled ... At the beginning of the Master's course I suffered from lack of English language skill ... I used the dictionary to understand the non-terminologies words, the unscientific words were the problem ... With the time I was able to build up my English vocabulary until I reached to the stage where I could access and search for any type of information'. (MCD10)*

From the student experiences above, it seems that these two students faced language difficulties in the earlier stage of their research. In this case, they used the dictionary as an information resource to develop their English vocabulary, which enabled them to interact with the library database effectively. Their language skill developed throughout the research process until they became comfortable searching in English at the end stages of their research. This means that the more English vocabulary the students have, the more they will be able to access and use the library database.

In summary, the ability of students to be on campus, which is associated with their status as full-time or part-time students, affected the library's role in supporting the students during the different stages of their research. The lack of availability of library resources, together with the lack of remotely accessible information resources, negatively affected the role of the library.

Some issues that emerged from the findings of this case study were related to the accessibility of library information resources. Those issues are library access points, library restrictions, invalid remote access and language difficulty. The more interesting issue mentioned by some respondents was that the remote access provided by the library on campus was not available to students in the labs.

In the light of the findings related to the study mode culture for all the research stages, it can be stated that:

- The more available the students, the more they will use the library services (Section 6.2.3.1, student availability).
- The library will be used more if the library is open longer (Section 6.2.3.1, library hours).
- Less use of the library by graduate students will mean less remote access and fewer library subscriptions to other subject-specific databases (Section 6.2.3.1, availability of library resources and services).
- The more library access points provided, the more its resources and services will be used by the students (Section 6.3.3.2, library access points, invalid remote access).
- The more library restrictions, the less library resources and services will be used (Section 6.3.3.2, library restrictions).
- The students' use of the library services and resources will decrease if they do not have sufficient knowledge of English (Section 6.3.3.2, limited English vocabulary).

#### **6.3.4 Students' personal experiences**

In the context of this research, students' perceptions reflect their personal experiences of the library services provided and their feelings about the use of its resources and services. The findings of this case study suggest two elements that help shape the personal experience cultural identity—the performance of library services and experiences communicating with library staff. The two elements as they relate to each stage of the students' research are discussed in Sections 6.3.4.1 and 6.3.4.2.

### 6.3.4.1 Performance of library services

Most of the students' interviewed for this case study complained about the library's performance in terms of services. They found the service insufficient for their needs, which varied through each stage of their research. They believed that the library should provide them with the appropriate services to support them throughout their research, as discussed below.

#### Stage 1: Proposal development stage

The students' needs at this stage are unlimited in terms of finding and searching for information resources to acquire the background knowledge required and to be able to decide on a research topic. During this stage, they need to access various information resources to finalise their topics and to complete their proposals. The library's performance during this stage is limited to providing the students with the information resources available. If the library was unable to perform at a level that met these needs, they would search for alternatives. One student stated:

*'Once my supervisor asked me to find information about the mechanism of actions for a specific enzyme, I did the search but I found either articles which I do not have access to or books [edited books] which did not contain sufficient information. Can you imagine: I could not find in-depth information even in the books? So I went back to him, he supplied me with many old books, dating back to 1983 and I found some information in the research papers he supplied me with'. (MCD3)*

The lack of information resources provided by the library in the form of books and journal articles relating to their specific topics dominated most of the responses of the case study participants. Another student in this stage described her personal experience with the online library catalogue as follows:

*'You cannot find all the books you search for. I do not know why but it is difficult to find all the books you request. Sometimes, the results do not provide me with the book I need, but when I browse the shelf, I can find it. Sometimes, when I couldn't find the book I needed by searching the electronic catalogue, I used the card catalogue and then got what I needed'. (MCD4)*

According to the students' statements above, it seems that the library services are not performing to a level that can meet the students' needs in this stage. The students need readily available, easily accessible information, as they are occupied in lab work and have no time to

waste. Therefore, they seek their supervisor's support if they fail to find what they need in the library.

## **Stage 2: Mid-stage (data collection, data analysis and writing up)**

The needs of the students in this stage become more complex as they need to use different types of services provided by the library to obtain information in order to expand their experiment, finalise their results, and report them in their theses. One student described her experience with the Science Direct database as follows:

*'I used mainly Science Direct but I was not able to find up-to-date papers as I was always keen to use very up-to-date papers. Most of the time, the new papers were not accessible and I had to pay to access ... There are journals providing up-to-date papers but the full texts were not accessible without fees. The library did not have subscriptions to some journals'. (MCD6)*

Another student complained about the ILL services provided by the library .She stated that:

*'I used mainly the most recent papers published in journals, either hard copy or electronic - whatever was available. One paper was very important to me ... when I requested it from the library; they told me the request must go through my supervisor. It was a long process ... Requesting it via the library was a nightmare and the process was very difficult and it would take a long time to reach the library, so I preferred to buy it myself.' (MCD7)*

According to the above, it seems that the library needs to optimise its performance to a level that can satisfy the needs of the graduate students in this stage. The students depended at this stage on up-to date information provided by journal articles. The limited subscription arrangement with Science Direct prevented the students from accessing some up-to-date full-text articles. If the library did not extend its subscription to include more e-journal in the field, the students would use alternative information sources to fulfil their needs.

## **Stage 3: Reflections on students' experiences**

The microbiology students at this stage reflected on their experiences using the library services by recommending various improvements that might be made to the library services. Their suggestions are as follows:

- Increase the number of library subscriptions to leading databases to allow the students to access full-text papers. One student stated:

*'I think the library should increase its subscriptions to more universal journals which will allow the students to access the full-text papers. Although, the interlibrary loan service was able to bridge the gap, the process of gaining the papers and then the time the student must spend waiting for her request was not acceptable... Sometimes, as a student, I preferred to search for alternatives to the paper I needed, to avoid spending time waiting for a new request'. (MCD10)*

- Upgrade the remote access services to enable the students to access the library remotely from home. As one student asserted:

*'The main problem I faced was related to the accessibility of the databases as I was unable to access the full-text articles from home so I had to come to the library to access them. If I needed to do this from the area surrounding the library, my computer had to be on the library's network. The library must maintain its systems and network to allow students to access it from home'. (MCD11)*

- Establish a connection with other university libraries and other professional organisations to enable the students to access specific information resources. As two students stated:

*'The university libraries are supposed to all be connected, since they belong to one university. Students should be able to access any database in any library without any difficulty. Sometimes, if I request a research paper from the medical library, I have to wait around two days to obtain it'. (MCD9)*

*'There is an urgent need to maintain a good connection between all applied science departments in the University and Kuwait Institute of Scientific Research'. (MCD10)*

- Increase publicity about the services so that the students become more aware of the services provided by the library. As one student stated:

*'Also, the library should market its services better, because most of the services provided by the library I found out from the study and not from the library itself and, even now, there are services I do not know about, such as the workshops'. (MCD10)*

- Extend the library hours during the working day and on weekends. As one student suggested:

*'Increase the opening hours of the library to past 9:00 pm. Also, I wish the library would extend its working hours at weekends and be open beyond 2:00 pm on Saturdays'. (MCD9)*

In summary, according to the above facts identified in each stage and based on the students' perceptions, the performance of library services seems inadequate to satisfy student needs. Their research-specific needs require a high level of library services. If the library services are not at a level that can fulfil the students' needs, they might search for alternatives outside the university, meaning that the use of the library services by the graduate students will be low as its service function level degrades.

#### **6.3.4.2 Library communication experience**

In this case study, the students' communication with the library staff has been identified from the data as one of the most important issues that shaped the students' personal experiences. Such communication experiences developed throughout the research process. Accordingly, this element as it relates to each stage of the students' research is discussed below:

##### **Stage 1: Proposal development stage**

All the microbiology students were full-time and therefore able to be on campus during the day. At this stage, the supervisor encouraged them to visit the library and search for the resources they needed. Therefore, the students needed to communicate with the library staff to seek help in finding the information and learning how to use the library services. One student stated:

*'At the beginning ... I faced some difficulties. I used to seek help from the library staff on the second floor who used to help me and explain the issues I didn't understand. They explained to me how to search in the library and how to find related information resources. She sat with me and explained to me the process from A to Z'. (MCD1)*

When asked whom she sought help from when she needed information resources, another student commented:

*'I will ask the library staff ... I experienced this before and the librarians were very helpful. A few times, I needed books and I could not find them in their place, perhaps*

*because someone took them or because they were returned not to their place on the shelf. Always, the librarians helped me to find them'. (MCD2)*

According to the students' experiences above, the library staff made great efforts to provide help when needed. The availability of the library staff in the daytime combined with the good performance of the library staff led the students to build a positive image of the library. As the students were available on campus, they tended to use the library and communicate with the library staff to obtain the information needed.

## **Stage 2: Mid-stage (data collection, data analysis and writing up)**

Although the students at this stage were busy in the lab, they still had to visit the library from time to time to use its services. During this stage, the students needed to use the photocopying services available in the daytime to complete their theses. The positive image built about the library in the first stage combined with the availability of the students on campus encouraged them to use the library and communicate with its staff. One student commented:

*'I like to go to the library early to search for my information. The staff will be there and available to help. They always helped me. Once, a library staff member spent extra time after working hours to complete some photocopying he'd started with me earlier'. (MCD7)*

The regular visits to the library and communication with the staff made the students familiar with other services they had not used before. One student in this stage stated:

*'I requested a paper, and they [the library staff] informed me that the library had it in its printed collection, and when I told the staff that I had searched on the database and the paper was unavailable, they taught me how to search for hard copies'. (MCD5)*

The positive image that the students built based on their good experiences with the library services encouraged them to use the library. The availability of library staff to provide help and library instruction encouraged the students to interact with the library services. During the research process, the image of the library developed as the demand for its resources increased. The students acquired a positive attitude about the library services after following the recommendations of their supervisors to use the library. In other words, the students' attitudes towards the library improved as they communicated more with the library staff.

### Stage 3: Reflections on students' experiences

The same factors that appeared in the previous stages were mentioned by the students in this research stage. As the students had submitted their theses, they were able to reflect clearly on their library experiences regarding their communication with the staff. One student commented:

*'In the first year ... I started visiting the library and I was able to find many staff who were motivated to assist and they helped me a lot. The main challenge was not only finding the papers that deal with my topic, but also knowing how to access those papers. The library staff were always willing to help and often provided one-to-one sessions for hours to teach students how to search for information and how to access the papers'. (MCD10)*

The students built positive images about the library through their interaction with the library staff after following their supervisor's recommendation to use the library. The same student added:

*'Once, he [her supervisor] asked me to search for a backdated paper and, when I couldn't find it, he suggested requesting it from the library by using the inter-library loan service. I had to sign the request from my supervisor then submit the form to the service desk. I used this service widely; it was very useful'. (MCD10)*

To sum up, in light of the above evidence, the positive image that the students built through their interaction with the library during the research process motivated them to use the library, while the recommendations of their supervisor helped to maintain the bridge between the students and library staff. As the students interact with the library services, their positive feelings about the library services will increase. In other words, the use of the library increases as the students' communication with the library improves throughout the research process.

Ultimately, in light of the above facts identified for each stage and based on the students' personal experiences, it can be stated that:

- The use of the library service by the students will be low if the level of service is low (Section 6.3.4.1, stages 1, 2, 3).
- The more the students communicate with the library, the more recommendations by the supervisor about the library there will be (Section 6.3.4.2, stages 1, 2, 3).



- The students' use of library services and resources increases as their image of the library improves (Section 6.3.4.2, stages 1, 2, 3).

### 6.3.5 Library information services

The accounts provided by these case study participants indicate that the library information service has an effect on their use of the library and information resources but not on the research stage itself. Training and support are identified as important elements that help in shaping the role of the information services provided by the library. This element will be discussed for all stages of the students' research in the following sections.

#### 6.3.5.1 Training and support

Training and support in this research reflects the students' needs for systematic training to learn how to use the library and the different types of information resources and services available. Although the library provides training sessions for users as requested, it has not targeted biological science graduate students by offering specific sessions. Based on the findings of this research four issues related to training and support were identified: information skills training; supervisor support; the students' personal efforts and promotion services, which are discussed below.

**A. Information skills training:** Biological science students did receive training to develop such skills, most of which took place at the undergraduate and graduate levels. In this case, the training element mainly consisted of module-and library-based training.

***Module-based training:*** The research findings show that the Biological Science Department offered an information skills module as an elective course. Undergraduate and graduate information skills courses were run to improve the students' information skills. Those students who chose these courses would benefit from them by developing their information skills. In addition, in some graduate-level modules, the students were requested to complete assignments related to the library and its services to pass the module. One student stated:

*'I have been taught via an academic module called 'Information Retrieval' how to use the library information resources, including databases and how to search using keywords. As a part of the module, I had to attend a seminar run by the library to train us how to search the library and what information resources the library had, including*

*microfilms and microfiches ... It was part of the module. The tutor informed us that she had booked a library session delivered by a professional librarian on how to use the library and we took a tour around the library to become familiar with its contents and collections. We were requested to complete a report. To be fair, I was able to gain great benefit from this training which I received from the first year'. (MCD11)*

As the students practice searching for information during the module, their information skills will develop.

**Library-based training:** Throughout the research stages, the library staff provided one-to-one session training based on the students' requests to improve their information skills. One student reflected on her experience throughout the research stages as follows:

*'At the beginning, I used to trouble the library staff, who were very cooperative and helped me to find my way ... to be honest, I received great help from the librarians who provided every assistance possible ... The librarians used to provide me with one-to-one sessions to teach me what to do and where to search. Also, he taught me how to open, save and print PDF documents, which contributed widely to my skills.'* (MCD10)

It can be seen from the above evidence that the information skills of the students developed through modules in coordination with the library or through one-to-one sessions based on the students' requests that were provided by the library staff. The library appeared to influence the development of the students' information skills. In other words, the more training support the library provides, the more students depend on the library to develop their information skills.

**B. Self-Training:** The students' ability to search and use information based on their own attempts to fulfil their needs reflects their personal effort. It was mentioned earlier that the students received systematic training through modules to improve their information skills. The students who did not attend those modules depended on their own efforts, using trial and error to find the relevant information. In this case, what notably shapes the training element is their personal effort. According to a student in the proposal stage, the library did not appear to have any influence.

*'Researcher: Do you use the Science Direct database?*

*Interviewee: Yes*

*Researcher: Have you been taught how to use it?*

*Interviewee: No, no one taught me, I have learnt by myself.*

*Researcher: Can you tell me how?*

*Interviewee: By practising, I made many attempts until I became capable of using it'. (MCD2)*

- C. Supervisor support:** Across all the research stages, the training role of the supervisor is reduced. For all microbiology students, the supervisor played a subsidiary role in training them to search for information related to their topic. As the students attended modules beginning in the first year to learn how to use the library, when they started their research in the second year they were already skilful in searching. In this case, the students may seek their supervisors' help when they face difficulty in finding the information resources but not training. As one student in the proposal stage commented:

*'He [her supervisor] is very helpful. He directs us to the best way to search the library database. We have our own methods but he can direct us towards the best one. Sometimes, he teaches us how to use different keywords in different ways'. (MCD1)*

- D. Promotion of services:** Marketing is an issue that helps to shape the library's information services, bearing in mind that most of the students who participated in this study had not received any systematic training provided by the library, as most of their knowledge about the library came either from the modules they attended or their personal experience. Most of the participants claimed that they did not receive any type of promotional message to attend a training programme. When a student in her final stage was asked about her awareness of the workshops provided by the library, she commented:

*'I did not hear about that through all of my research stages at this university. No, I didn't hear about that, even in my final stage'. (MCD9)*

One student in the mid-stage admitted that she was aware of the workshops provided by the library through her supervisor:

*'[I got this] from skills I have gained during my undergraduate course; and from the training I have received during the Master's course via a module called 'Information*

*Retrieval'. I attended a workshop here in the library; most of the delivered information I was familiar with. One of the lectures aimed to teach us how to use the new electronic journals subscribed to by the library ... My supervisor notified me and encouraged me to attend it'. (MCD8)*

From the discussion above, it seems that the marketing of the library training sessions is insufficient and does not reach all students. Even though microbiology students are not allowed to register as part-timers and therefore have the ability to be on campus in the daytime, the promotion of library services failed to reach them. The library should have more publicity for its services, so that all students can be aware of them. If the students do not know what services are available, they might not use them. In other words, the more effective promotion services the library provides, the more the students will use its training services.

In sum, the library information services influenced the role of the library. The lack of effective publicity of the services provided negatively affected the role of the library. The more unknown the services are to the students, the less they will use them.

Therefore, in light of the above facts identified in relation to the library information services, it can be stated that:

- The more training support the library provides, the more dependent the students will be on the library to improve their information skills (6.3.5.1, information skills training).
- The more training support the library provides the fewer personal training methods the students will use to improve their information skills (6.3.5.1, self-training).
- The more training sessions the library provides, the smaller the role of the supervisor as an information skills trainer (6.3.5.1, supervisor support).
- The more promotion services a library provides, the more its training services will be used (6.3.5.1, promotion of services).

### **6.3.6 External information sources**

External sources can be defined as the sources available outside the university libraries. Across all interviews, external information sources appeared to have a great influence on the library's role in supporting each student's research. In this case, the information sources used were based on the type of topic selected rather than on the research process. The supervisors, experts in the

field and other libraries are three aspects of external information sources cultural identity and are discussed below.

- **Specialists in the field:** Only four students (MCD1, MCD4, MCD11 and MCD12) in this case study had a tendency to look for experts in their field to gather information related to their specific topic, as the information they needed was unavailable in the library. One student stated:

*'For example, once I met a Kuwaiti expert at a seminar run by KISR. He helped me a lot and we cooperated together to complete work similar to my work but focusing on a different type of organism. Again, he supplied me with very important information resources... and if my request was an article, then I might email or communicate with him to ask for a copy of his article'. (MCD11)*

Another student added:

*'Some staff there have done similar work to mine. I sought their advice; they supplied me with many important articles. Without their advice, I would have been unable to find the information... I sought the paper I needed from the author himself who works in the institute'. (MCD12)*

- **Non-university libraries:** In this case study, it has been found that students gathered information resources using all the possible libraries they could access. Most of the interviewees confirmed that they used other libraries to find information related to their specific topic that was not provided by their university library. As one student reported:

*'[...] I did not depend mainly on our library but, rather, used other libraries to find and access the information resources I needed... I used the EPA [Environment Public Authority] library and KISR Library in Kuwait. I found information resources which covered the region of Kuwait but not other regions which I needed mainly. I needed geological information alongside information about the soil and the micro-organisms' living environment, which I must provide as a background. I was unable to find this information in the library, so I had to search for it outside the library'. (MCD11)*

Another student commented:

*KISR library is a specialised library in the research of sea ecology, so I thought it is worth checking what it might have, also the library there provides access to different databases ... I cannot access all the full texts from this library [science library] but I can from that library [KSIR library]. The library there as has old dated scanned articles about the geology of Kuwait as well, which I used'. (MCD8)*

It seems that the limited library subscription to the Science Direct database prevented the library from providing the students with sufficient topic-specific information. Therefore, they used other specialised libraries' databases to fulfil their needs.

- **The supervisor:** Although the supervisor encouraged the students to use the library resources and services, he acted as an external source of information when the library failed to meet their needs. When asked if she had searched for a specific information resource and failed to find it in the library, one student in the proposal stage commented:

*'We always encounter this problem, but my supervisor has a subscription to many databases and accounts to access them, so in this case I can ask him for help'. (MCD1)*

In addition, the findings of this research have shown that most students considered their supervisor to be a knowledgeable person. He/she is the only one who can help them when they cannot find what they need in the library. Another student in the mid-stage commented:

*'He provided me with different types of information resources to complete my discussion. He brought some of them from outside Kuwait because he worked on the same topic'. (MCD8)*

Another student reflected on how, during the research process, she did not seek anyone's help apart from her supervisor's, as follows:

*'Sometimes, when we are discussing the project, I told him about my difficulties finding some articles. Then, he used to help. I did not request it; he used to offer the help himself. When he feels I need some help, he provides it'. (MCD7)*

She added:

*'To write my introduction, I used a textbook ... My co-supervisor gave it to me as a gift to help me. It was very useful, thank God. Some of them [books] were from the supervisor's personal collection. He lent me a few books.'* (MCD7)

This element, which shapes the meaning of the external source culture, appeared across all the stages and was identified by students with different types of topics. The students used the supervisor as an information source when the library failed to meet their needs, and this can influence their use of the library. This means that the more dependent the students are on their supervisor, the less they will use the library.

To sum up, in light of the above facts, it has been found that external information sources were highlighted across all research stages and three types were identified. Whilst all the students named the library as a main source from which they sought information resources, they included other professionals, such their supervisor, experts in the field and other professional libraries.

In light of the above, it can be stated that:

- The fewer specific information resources provided by the library, the more students will seek information from experts in the field (specialists in the field).
- The less access to its resources the library provides, the more dependent the students will be on external specialised library databases to meet their needs (non-university libraries).
- The fewer specific information resources the library provides, the more dependent the students will be on their supervisor as an external information source (the supervisor).

### **6.3.7 Financial adequacy**

This cultural identity element represents the students' financial capability to pay for the information resources needed for their research. Ability is the only element identified from the data that shaped the students' financial adequacy. Students bought their information resources, including books and journal articles, because they have the required funds to pay for them and are unwilling to spend time waiting for the library to meet their needs. The examined data reflects that no effect of this cultural identity element on the research process, but its effect on the students' interaction with the library has been noted. This element is discussed below.

### 6.3.7.1 Capability

Students in this case study intended to buy their information resources as they complained about the lack of library information resources related to their specific research topics. This fact appeared across all stages. In other words, the students bought different types of information resources as needed when the library was unable to provide them. Four students in this case study (MCD1, MCD5, MCD7 and MCD12) confirmed this. One student stated:

*'The main problem to me was the lack of information resources required to support my topic. So the only information resource I used in the library was articles because most of the books were out of date and not in my focus. I had to buy many books from my own pocket to cover my needs'. (MCD12)*

Another student confirmed that she paid to access some online library databases to obtain information resources that could not be accessed via the library database:

*'I subscribed to the British Library in the UK to be able to access the papers I could not access ... I also subscribed to another library in Australia ... to access the papers that were unavailable.*

*Researcher: Why don't you use the interlibrary loans service?*

*Interviewee: To me, it was very expensive. Once, I requested a paper and it cost me around 5 KD for one A4 page...*

*Researcher: More expensive than subscriptions?*

*Interviewee: Yes, I subscribed to the libraries as a user. In this case, I can access any papers for free.*

*Researcher: But, as far as I know, the interlibrary loans service makes a request to the British library?*

*Interviewee: Yes, but the process also takes a long time. I have to wait a fortnight to get my request'. (MCD5)*

The high cost of requesting information resources through the ILL and the wait involved led this student to pay the subscription fee to obtain what she needed more quickly and at lower cost. When students have the required funds to pay for the information resources, they will not wait for the library to meet their needs. It can be seen from the evidence provided that financial



adequacy is another factor that emerged as having an influence on the students' use of the library.

Based on the discussion above, it can be stated that:

- The less effective the library services provided, the more the students' use their own funds to acquire the information resources needed.

## 6.4 Emergent issues

This section presents some issues that emerged from the above data analysis that can be considered as the research contribution of this case study, namely issues related to the role of the library and information literacy education. These issues are discussed in Section 6.4.1 and Section 6.4.2.

### 6.4.1 Issues related to the role of the library

In this section, several observations emerged related to the use of the Science Library in addition to the observations in Chapter 5 (Section 5.4.1). These observations are as follows.

#### **For the first stage:**

- There is a relationship between the unavailability of the supervisor as an information source, to build up the proposal and the high use of the library in the first stage (Section 6.3.1.2 information sources and resources).

#### **For all stages:**

- There is a relationship between the experimental nature of a topic and a high demand for EIRs (Section 6.3.1.2, experimental nature, stages 1 and 3);
- There is a relationship between the information skills abilities of the students and their use of the library, and this developed throughout the research process (Section 6.3.2.1, information skills capability, stages 1, 2 and 3);
- There is a relationship between the availability of the students on campus in the daytime and the high use of library services (Section 6.3.3.1, students availability);
- There is a relationship between the low availability of library remote access and subscriptions to other subject-specific databases and the low use of the library (Section 6.3.3.1, availability of library resources and services);

- There is a relationship between students' English language skills and the low use of the library resources and services (Section 6.3.3.2, Limited English vocabulary);
- There is a relationship between the supervisor's recommendations and students' increased communication with the library staff (Section 6.3.4.2, students communication experience);
- There is a relationship between the positive image developed through the students' communication with the library and the increased use of its resources and services (Section 6.3.4.2, students communication experience);
- There is a relationship between the one-to-one training sessions that the library provides and the students' dependence on the library to improve their information skills (Section 6.3.5.1, training and support);
- There is a relationship between the library's limited subscriptions to subject-specific databases and the students' dependence on other specialised libraries' databases to meet their specific needs (Section 6.3.6, external resources);
- There is a relationship between the specific resources that the library provides and the students' dependence on specialists in the field or their supervisor to fulfil their specific information needs (Section 6.3.6, external resources);
- There is a relationship between the efficiency of the library services and the students' dependence on their own funding to acquire the information resources needed (Section 6.3.7.1, capability);

These observations will be compared with those of the other three disciplines. Only the most important will be discussed further in Chapter 9.

## 6.4.2 Information literacy education

The most important issue that emerged from the analysed data relating to the microbiology field is that graduate students are able to conduct independent searches for information without their supervisors' assistance. They are able to access, retrieve, use and evaluate the information needed to conduct their research. They understand the range of information resources available in various formats in the library and are able to develop and use effective strategies for locating information from the very beginning. One student stated:

*'I searched for the required information by myself and I found most of it published in the journals. I accessed the library database to find the information related to my topic'. (MCD4)*

This may be because students majoring in biology at KU undergo formal information literacy instruction as part of the general education requirements at the undergraduate level, in addition to optional information literacy courses provided in their Master's programme to enhance their information skills. One student stated:

*'[I got this] from skills I have gained during my undergraduate course; and from the training I have received during the master's course via a module called 'Information Retrieval''. (MCD8)*

The elective module integrates computing skills training and library skills to enhance the graduate students' information skills abilities (Section 6.3.5.1) before commencing their research. It may be argued that students who attend this course demonstrate better information skills than those who do not. Another student said:

*'I have been taught via an academic module called 'Information Retrieval' how to use the library information resources, including databases and how to search using keywords...To be fair, I was able to gain great benefit from this training which I received from the first year'. (MCD11)*

However, practising searching for information to fulfil their information needs during the research stage also has a great impact on enhancing the development of their information skills (Section 6.3.2). In addition, those full-time students who do not attend these courses have the opportunity to communicate with the library staff during the day (Section 6.3.4.2) and request one-to-one training sessions to improve their information skills throughout the research stages.

It can be debated here whether the extensive use of the library in this field might be attributed to the information literacy education received by microbiology students, to the culture of the discipline or to other factors. Regarding this, the researcher will suggest further research to investigate to what extent integrating information skills training into modules can add value to the use of the library by graduate students when conducting their research in the conclusion.

## **6.5 The social organisation of the microbiology field and information use and behaviour**

This section discusses the cultural characteristics of the microbiology field based on Whitley's two concepts 'mutual dependence' and 'task uncertainty'. The cultural identity of this field and its relationship with the information use and behaviour of the graduate students is presented in Sections 6.5.1 and 6.5.2.

### 6.5.1 Cultural identity of the field

Microbiology is a laboratory science that encompasses research work that is based on controlled experiments and is analysed using statistical methods. Related fields include marine ecology, biochemistry and medicine. The research culture of this field was described by the participants as including goals and problems that are inadequately hierarchically ordered and research techniques that are extremely standardised. This fits with Whitley's (2000) description of a domain structure with a relatively high degree of 'strategic uncertainty' (see Chapter 2, section 2.6.2.1), as their research problems (topics) and goals are varied and not clearly ordered. Uncertainty about research problems in this field makes the choice of topic for the research difficult as there are many options from several research areas. For example, graduate students in this field can choose a topic from two research areas:

*'We have in our field two options for choosing our research topic: either 'medical or environmental...'. (MCD1).*

The microbiology graduate students work within a relatively uncertain intellectual environment, and so it is difficult to decide on a topic and to decide how to deal with the research problem. Therefore, the students depended on their supervisor's guidance in selecting a topic:

*'My supervisor suggested more than one topic and then I had to select one'. (MCD3).*

The students also sought the advice of specialists regarding how to tackle their chosen topic:

*'I sought some advice from professors ... they provided me with different advice and encouraged me to tackle the topic...'. (MCD4).*

In addition, the graduate students have to read carefully about the topic so they can understand it before deciding on a topic:

*'I had to carry out a heavy search to find the information I needed to select and understand the topic.' (MCD11).*

This indicates that the degree of uncertainty about topics in this field is relatively high. Uncertainty about the importance of the research problem leads to the lack of a clear formulation of the research strategy based on common goals. Therefore, the research methods are not fully understood:

*'Because my topic is related to the medical area, I have spoken to doctors. I went to hospitals and visited the microbiology departments; I asked the staff and learnt from them how to conduct specific experiments...'* (MCD1).

The research problems differ in terms of their perceived importance and also the ways in which they were formulated and understood. Graduate students characterise their research work as being dependent to a certain extent on their colleagues, such as their supervisor and other professionals in the field, as information sources:

*'I cooperated with the supervisor to find the best method for carrying out the experiment and obtaining the results we were expecting...'* (MCD8).

This reflects that the research outcomes in this field are highly visible and predictable, but the significance of the results has to be discussed with colleagues to be verified rather than approved based on the theoretical structure:

*'My supervisor encouraged me to carry out discussions with other people [lab technicians] to increase my understanding of the results and to feel more comfortable with my outcomes...'* (MCD5).

Variation in the theoretical structure leads to uncertainty about the relevance of task outcomes to collective goals. Therefore, microbiology students are less dependent on their colleagues for acquiring and accessing information resources compared to electrical engineering students.

The high degree of standardisation of technical procedures and results in this field is associated with low 'technical uncertainty' (see Chapter 2, section 2.6.2.1). The move towards creating a greater degree of 'strategic uncertainty' within a specific field means that the degree of 'strategic dependency' will decrease (high 'strategic uncertainty' and low 'strategic dependency'), while the move towards reducing the degree of 'technical uncertainty' means that the degree of 'functional dependency' will increase (low 'technical uncertainty' and high 'functional dependency'). This may result in a moderate degree of 'task uncertainty' and a moderate degree of 'mutual dependence'. Accordingly, this field is characterised as having a moderate degree of 'mutual dependence' and a moderate degree of 'task uncertainty' compared to the electrical engineering field. The social organisation of this domain is less tightly structured, leading to a decreasing level of co-ordination and control over research

within the specific field and across the discipline (Whitley, 2000). This has resulted in decentralised control over accessing resources.

### **6.5.2 Disciplinary shaping of information use and behaviour**

In this field, decentralised control over accessing resources can be observed, which shapes the information use and behaviour of the graduate students. The moderate degree of ‘mutual dependence’ limits the students’ dependence on their supervisor for acquiring and accessing information resources. Therefore, the library plays an important role as an information source that enables the graduate students to carry out their research. This shapes the students preference to access and use multidisciplinary databases, such as Science Direct, to fulfil their information needs because there is little overall concern with a hierarchy of goals. The moderate degree of ‘task uncertainty’ enables graduate students in this field to adopt a decentralised approach for communicating the information via digital resources. The diffusion of this field across diverse specialist areas leads the students to use the databases of other fields to fulfil their subject-specific needs. They may access other databases designed for other disciplines, such as medical science. They may also use the web to access bioinformatics tools, such as Gene Bank, to acquire information. In this field, e-journal articles are the most preferred resources as the research results are predictable and stable and are often communicated in articles. Due to the variation of theoretical structure in this field, students access and use both electronic and print resources.

## **6.6 Key characteristics of the microbiology field**

According to the analysis of the cultural characteristics of this discipline and based on Whitley’s two key concepts, this field can be characterised as having a moderate degree of ‘mutual dependence’ and a moderate degree of ‘task uncertainty’, which shaped the information use and information behaviour of the graduate students. These characteristics are discussed in Sections 6.6.1, 6.6.2, 6.6.3 and 6.6.4.

### **6.6.1 Characteristics related to the culture of the discipline**

Based on the culture of this discipline, several characteristics can be observed that shaped the information use and behaviour of the graduate students:

- The culture of this field, including a moderate degree of ‘mutual dependence’, made the students less dependent on the supervisor for accessing and acquiring information

and prefer to access and use multidisciplinary databases, such as Science Direct, to fulfil their subject-specific needs.

- The moderate degree of ‘task uncertainty’ enabled the graduate students in this field to adopt a decentralised approach to access and use information resources.
- The diffusion of this field across diverse specialist areas led the students to access and use information resources from neighbouring fields.
- The main information resources the graduate students in this field preferred to access and use are e-journals.
- The experimental nature of this field controls the types of resources used by graduate students, such as software libraries and bioinformatics tools.
- The research culture of this field, which is based on lab work, shaped the students’ preference for accessing the library remotely from the lab.
- Integrating training sessions into modules provided at the graduate level enabled the students to build their information skills.

### **6.6.2 Characteristics related to the role of the supervisor**

Some characteristics related to the educational role of the supervisor in this field can be observed to have shaped the information use and behaviour of the graduate students:

- The educational role played by the supervisor as a source of guidance rather than an information provider encouraged the student to be independent in searching for information related to their research topic.
- The supervisor’s recommendations regarding the importance of the library in fulfilling the students’ information needs made the students dependent on the library as a main source of information to carry out their research.

### **6.6.3 Characteristics related to the Science Library**

Additional issues related to the library resources and services that affect the information use and behaviour of the graduate students include:

- The availability and accessibility of library e-resources in relation to the availability of the students on campus during the daytime (full-time students) encouraged the students to access and use the library to fulfil their information needs.

- The training support (one-to-one training) provided by the library during working hours in relation to the availability of the students on campus during the daytime enabled the students to develop their information skills.
- The limited subscriptions to subject-specific databases in the field forced the students to use the databases of other libraries.
- The inability of the library to market its services effectively caused some students to depend on their own self-training.

#### **6.6.4 Characteristics related to the microbiology students**

Not only did cultural characteristics have a great impact on the information use and behaviour of the graduate students but also the students' characteristics in this field had an impact on their information use and behaviour:

- The availability of the students on campus during the daytime (full-time students), which corresponds with the library's hours, helped make the students dependent on the library to carry out their research.
- The ability to communicate with the library staff during working hours (daytime) effectively shaped the students' positive attitude towards the library.
- The students' information skills abilities encouraged them to interact with the library online resources and services effectively, which developed throughout the research process.
- The limited English vocabulary of certain students reduced their ability to interact with the library's database effectively.
- Cultural issues, such as adequate finances, encouraged the students to depend on their own funds to buy the information resources needed, which negatively affected their use of the library. The diagram below (Figure 6.1) illustrates the main characteristics of the microbiology field, as suggested by the interviews summarised in this chapter.



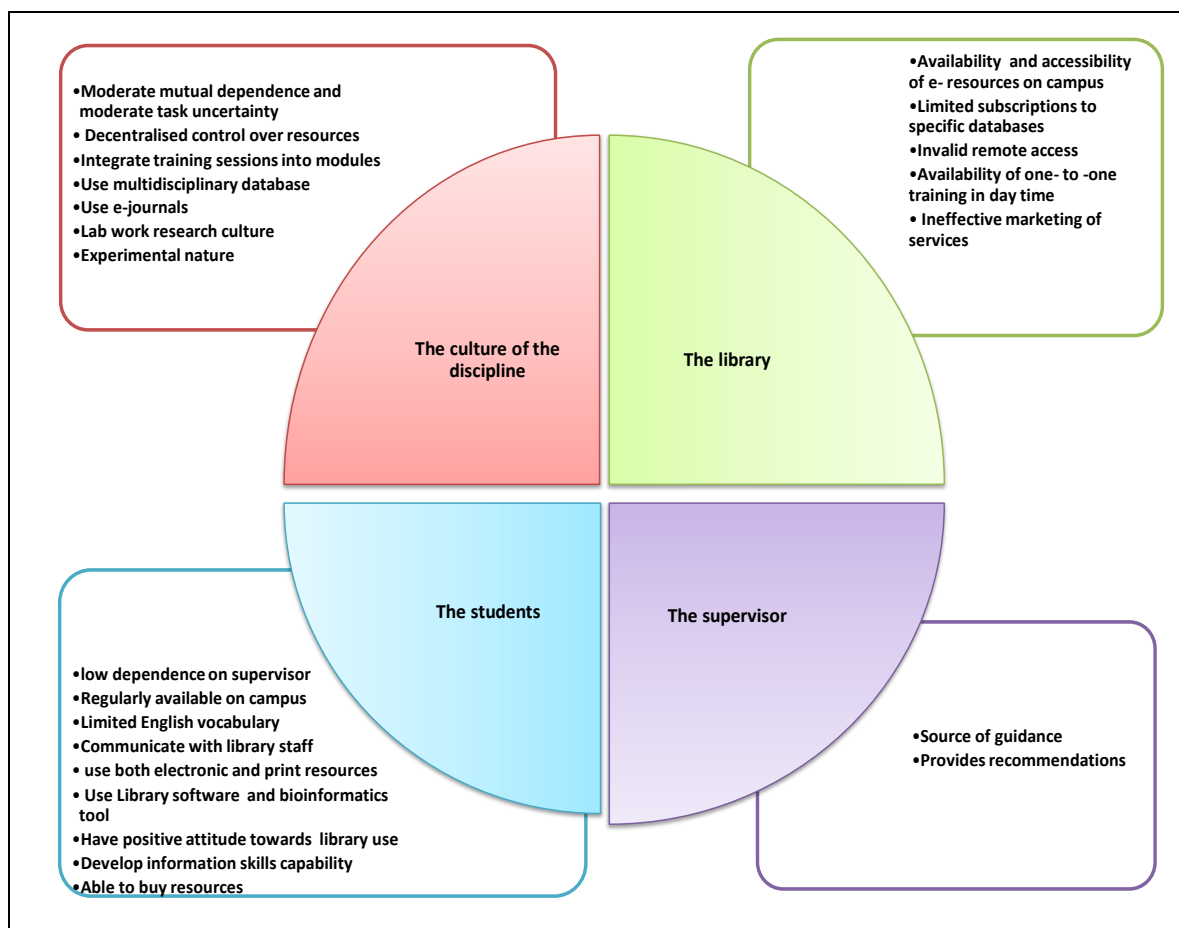


Figure 6-1 Key characteristics of the microbiology field at Kuwait University

## 6.7 Overall summary

According to the findings of this case study, the nature of the discipline, information needs, study mode, students' personal experiences, library information services, external sources and financial adequacy are the key factors identified that affect the information use and behaviour of graduate students. These are in addition to the research stages, which appeared to be an interacting factor that affected the use of the library by graduate students. The experimental nature of the microbiology field controlled the types of information resources to be used and increased the demand for e-resources, such as bioinformatics tools and software libraries. The library appeared to be the main source of information that the students depended on to acquire different types of information resources, including academic papers and books. The ability of the microbiology students to conduct independent searches for information from the beginning without the supervisor's assistance was recognised, which influenced their interaction with the library resources and services that developed throughout the research stages.

The availability of the microbiology students on campus during the daytime that corresponds with the library hours enabled them to benefit from the services provided by the library to support their research. The communication experiences of the students with the library staff, together with the supervisor's recommendations, encouraged the students to build a positive attitude towards the library staff. For most of the participants in this study, the image of the library tended to be positive because the library was able to provide the required information skills training to allow students to carry out their research. The library was given as the first option in terms of seeking information, whilst the supervisor and other libraries were ranked as the second options. However, the limited performance of the library services combined with the lack of specific information resources prompted them to seek other sources of information or to buy the resources, which negatively affected their use of the library. In addition, the inability of the library to market its services effectively to the students appeared to be another factor that negatively affected library use.

The cultural context of this field also influenced the information use and behaviour of the graduate students. Where there is a moderate degree of 'mutual dependence' and 'task uncertainty', a decentralised approach to using information resources is adopted. A multidisciplinary database was the main source for accessing e-resources. Print resources played a significant role in the microbiology graduate students acquiring the information needed to carry out their research, and they depended to a lesser extent on specialist colleagues, such as their supervisor. The research culture of this field, which is based on lab work, shaped the students' preferences with regard to accessing and using the library remotely.

Given the small sample size, many of the emerged observations would need evidence from other fields or more data to formulate hypotheses to be tested in further research to explain the relationship between the library's supporting role and the factors identified. These hypotheses can act as the research contribution to facilitate our understanding of the complex set of interacting factors that influence the pattern of library use and the influences of information literacy education.

Improving the library's role and contributions to biological science students' research processes probably depends on its ability to promote its services effectively, improve the current digital systems, address other weaknesses and focus on what the cultural context of the microbiology field requires to satisfy the information needs of the students.

## CHAPTER 7 – ARTS DISCIPLINE/THE ISLAMIC HISTORY FIELD

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### 7.1 Introduction

This chapter presents the findings of 12 interviews conducted with Islamic history graduate students studying at KU concerning their perceptions about the use of the library and information resources during their research process. The data collected from the interviews were transcribed and translated from Arabic into English. Once the transcription and translation procedure was complete, the coding process started, as described in Chapter 3 (Section 3.11.2.2). The findings from the analysed data are presented using direct quotations from the participants' responses.

The chapter proceeds as follows. The first section presents the characteristics of Arts College interviewees (Section 7.2). This is followed by a discussion of the cultural characteristics of the discipline during each stage of the research (Section 7.3) and then a discussion of each cultural aspect in the following sub-sections: the culture of the discipline (Section 7.3.1), information needs (Section 7.3.2), study mode (Section 7.3.3), students' personal experiences (Section 7.3.4), library information services (Section 7.3.5), external information sources (Section 7.3.6) and financial adequacy (Section 7.3.7). Next, the emergent issues related to the Islamic history discipline are presented (Section 7.4). The disciplinary shaping of the information use and behaviour of graduate students is discussed next (Section 7.5), followed by a discussion of the key characteristics of the discipline (Section 7.6). The chapter closes with a summary of the students' perceptions of the college library's role in supporting their research (Section 7.7).

### 7.2 Characteristics of the interviewee sample

The participants were students from the Department of Islamic History at KU (College of Arts). History students must present the research that they undertake during this programme in the form of a thesis. Seven participants are female, of whom four were full-time students and three part-time. The other five participants are male, all of whom were part-time students (see Table 7.1).

**Table7-1 Numbers of participants and their characteristics**

Participants' characteristics	Females	Males	Overall total participants
Part-time	3	5	8
Full-time	4	0	4
Total	7	5	12

The candidates were selected purposely from three different groups in terms of the phases of their research: the first group included students who had completed their proposal and were ready to start their research; the second group included students who had already embarked on their research and were in the process of writing up their theses and the third group included students who had already submitted their thesis.

Accordingly, the findings of this case study were divided into three main stages:

- Stage 1: the proposal development stage;
- Stage 2: the mid-stage (collecting and analysing data, presenting the results and writing up);
- Stage 3: reflections on the students' experiences throughout their research process.

Therefore, an equal number of participants were selected to represent the following stages:

- Four students in the proposal development stage;
- Four students in the data collection and analysis stage;
- Four students in the reflection stage (students who had submitted their theses successfully).

### **7.3 Analysis of the cultural characteristics of the discipline at each stage of students' research**

As the part of aim of this study is to investigate the role of the library and how it has been influenced by the research process, it is important to demonstrate the cultural identity of the specialism of Islamic history within the history discipline and how this shaped the students' use of the library. Therefore, the cultural identity factors identified in Chapter 3 (Sections 3.11.2.2) are highlighted, based on the social and intellectual interactions of the history

graduate students with the library resources and services throughout their research stages. In this section, the cultural characteristics of the discipline in all considered research phases are illustrated, supported by evidence from the collected data.

### 7.3.1 The nature of the discipline

The analysed data shows that disciplinary culture has an influence on Islamic history students' use of the library and information resources. This cultural identity influences two elements: topic selection and the nature of the topic (that involves historical nature) which are discussed in Sections 7.3.1.1 and 7.3.1.2 below.

#### 7.3.1.1 Topic selection

History students are expected to complete theory-based modules to be able to start working on their thesis projects. Each must choose a research topic that his/her supervisor must approve as well as develop a proposal, including a brief introduction to the topic, a justification of the choice, a research plan, a simple conclusion or recommendations and a list of references. The student must submit the proposal to the CGS Committee for approval. This element of cultural identity will be discussed as it relates to each stage of the students' research.

#### Stage 1: Proposal development stage

In this field, students' supervisors usually guided them in selecting research topics. However, the students freely chose sub-topics that interested them. All the students in this stage confirmed that they adopted this approach. They tended to base their decisions on comprehensive literature searches conducted in order to undertake broad background reading to establish their research focuses. The students in this case study chose their research topics based on the following methods:

- **Supervisor-based selection:** Regarding this concept, two part-time students (IHD1 and IHD2) confirmed that they depended on their academic supervisors to make the decisions on their behalves. The supervisors directed the students towards possible research topics, and the students chose the sub-topics that most interested them based on their in-depth studies of various historical periods during the modules. In this case, the students searched the literature when undertaking their background reading to check the adequacy of the available information resources related to the sub-topics and then made the final decisions about their topics. One student commented:

*'I discussed the possibilities with my supervisor ... He recommended searching for a new topic to study ... He suggested studying an Islamic city, and he left the choice of the city to me. He directed me where I could find what I was searching for ... Because, I was aiming to study a place, a city, I decided to first read traditional explorers' books and Islamic history books'. (IHD1)*

The student needed to undertake initial background reading before she made her final decision about the historical focus of her topic. Although her supervisor recommended the main context of the topic, searching for information resources about the sub-topic was her responsibility. In this case, the supervisor did not provide the student with the information resources but directed her in terms of where to search for the relevant information.

- **Multiple methods selection:** Two students (one part-time and one full-time) (IHD4 and IHD3) indicated that they adopted this perspective, as they selected their sub-topics based on the knowledge acquired in a course module or by thoroughly searching the literature, in addition to consulting their supervisors. During the interview, one confirmed that he chose his sub-topic after intensively searching and reading about it in the literature.

*'I consulted the academic staff in my department ... I received many suggestions from them ... I spent six months between experts and the library until I was able to define five candidate topics, which were new and had not been studied before. I consulted my supervisor, who selected three, and, when I consulted another ... expert in the field, he selected one ... I informed my supervisor, who encouraged me to tackle the topic'. (IHD4)*

The students in this discipline seemed to spend a long time searching for information to decide on suitable sub-topics. During this period of time, the students needed to consult different information sources, including their supervisors and other experts who might help in making the final decision. The second student stated:

*'As a Master's student, I am expected to tackle a new area in the field, a new ... issue which has not been studied before, and my supervisor was able to direct me towards that ... In my case, my supervisor suggested the main topic but I personally selected the study's specific focus ... I completed a module with the same supervisor focusing on the same issue. I used to write an assignment every week covering a specific aspect of this*

*issue. Accordingly, I became familiar with the related information resources. I wrote over ten assignments and saved them on my computer, then used these later to build up the discussion in my dissertation'. (IHD3)*

The students in this case chose their research sub-topics based on their familiarity with them which they gained through previous investigations during modules or by consulting the literature or other experts in the field. Originality was a concern when the students wished to define their research topics.

Two different ways of selecting sub-topics were identified. Students in the history field could select the historical facets of their topics based on their interactions with the related sub-topics during modules or based on their own background knowledge built through reading and searching the literature and seeking expert advice. In this discipline, supervisors guided the students regarding the main topics to select, but the students had free choice regarding the historical focus of their topics.

## **Stage 2: Mid-stage (data collection, data analysis and writing up)**

The same issues that appeared in stage one (the proposal development stage) also appeared in this stage, as reported by one student interviewed during this stage. Although the researcher did not intend to ask about the topic selection process, as the decision was made in the first stage, an issue relating to supervisor involvement in the topic selection emerged when the researcher asked about the types of research methods used. The student commented:

*'First, the student will consult his or her supervisor on the areas of Islamic history which he or she might research. Then, the student will be free to choose any historical aspect according to his or her interest. The student, will then perform a thorough reading of this historical aspect and make his or her final decision about the research topic ... After this, the research topic will be sent to a committee outside Kuwait to make sure that this topic has not been researched before'. (IHD5)*

This student, who was in the second stage, was able to specifically identify the process of topic selection and it corresponded to what students in the proposal stage stated earlier. This means that students who are in mid-stage are able to describe the activities involved in the selection process better than those in the proposal development stage.

### Stage 3: Reflections on students' experiences

At this stage, no evidence emerged from the students' experiences about the topic selection process, as the topic had been decided during the first stage and the researcher did not ask the interviewees about it at this stage.

The above experiences in stages 1 and 2 indicated that, the role of the supervisor in terms of selecting a sub-topic, is as an advisor; he/she guides the students to a possible sub-topic, but making the final decision and finding the appropriate resources are the students' responsibility. In this case, the supervisor would not supply the students with any information resources but encourage them to visit the library and search for the required information resources.

Based on the above information, a set of issues that influenced topic selection and shaped the demand for library resources and services, in turn influencing the library's role, was identified. These issues are as follows.

- In supervisor-based selection, the both Arts Library/women and the Central Library resources seemed to be used more, as the supervisors encouraged the students to undertake more background reading.

*'He [the supervisor] did not select the target city for my research; rather, he asked me to read and search for a suitable one ... I searched mainly in the university libraries'. (IHD1)*

- IHD4, who followed the multiple-methods selection, seemed to use the library more for searching the literature to make a decision. He stated:

*'I searched in Kuwait University libraries. I searched for Arabic resources on my topic ... My main search concentrated on Jaber Al-Ahmed Central Library because it is richer than the Library of Arts'. (IHD4)*

- The students who considered the modules as a basis for their multiple-method selection, seemed to use the library less:

*'Searching for the module and completing the tasks introduced me to new horizons ... Although the university libraries were a very useful source for collecting information resources for reading purposes, they were not my first choice because I found all of the information resources I needed in the Centre ... [non-university library]'. (IHD3)*



In this case, the student became familiar with other information sources related to his potential sub-topic outside the university and therefore used the university libraries less.

To decide on a topic, students needed to have background knowledge about the subject matter. Acquiring background knowledge required the students to consult information resources related to their specific sub-topics, by investigating them through their graduate-level modules, consulting experts in their subject area (such as other faculty members) or searching the literature. In addition, different sources were sought to find the required information. The library was identified as one of the sources students used to find relevant information. The supervisor's role seems to have been guiding the students to identify the topic themes, which helped the students make the final decisions themselves. However, the supervisor had to agree on the selected sub-topic before a final decision could be made. The supervisor encouraged the students to search the literature for relevant information. Even if the supervisor did not recommend the sub-topic, the student had to search for the required information resources to meet the topic selection requirements. The students also targeted other sources outside the university to find more information in order to decide on topics.

In this case study, the supervisor dominated topic selection despite the different methods the students used in selecting the sub-topics. In both methods, the supervisor appeared to select the main research topic. Therefore, in the light of the findings regarding the topic selection element, it can be stated that:

- The library will be used more often as other information sources, such as the supervisor, become less available for topic selection (IHD1, IHD2, IHD3 and IHD4).

### **7.3.1.2 The nature of the topic**

Based on the nature of this discipline, the students engage in studying written records about the past. The reliability of the information about cities, places or past events is important. The value of the library is based on the extent to which it can provide the students with old information sources. In this case study, the accounts provided by the interviewees indicate that the nature of the topic was influenced by the historical nature of the discipline, which in turn influenced the type of information sources to be used. These two issues as they relate to the research stages are discussed below.

## Stage 1: Proposal development stage

History students in general and Islamic history students in particular are expected to identify a topic for their dissertation and develop a proposal based on that topic. Therefore, they have to search the literature thoroughly to undertake background reading about the topic. The accounts provided in this case study show that the historical nature of the topic influenced the use of the library. This issue is discussed below.

- **Historical nature:** When selecting a topic, the students are expected to focus on a new area or issue that has not been studied before. The historical nature of the topic requires the collecting of information from various sources; both primary and secondary sources are required. This demand influences or shapes the role of the library. At this stage, all the students confirmed that they were required to choose an original topic. One student stated:

*'[My supervisor] asked me to search for an Islamic city which had not been studied before as my target city ... Before I discussed the selected city with my supervisor, I had to check the availability of information resources which studied or discussed my city. I needed to check if there were sufficient information resources to complete the project successfully'. (IHD1)*

In order to fulfil this request, the students had to search for information in both primary and secondary sources. The same student stated:

*'In history in general, there are different types of information resources which we should collect information from. There are two main types, references books and primary documents. To perform unique academic research, a student is expected to collect information from the primary source of information; therefore, we have been taught how to search this type of information resource ... because I have a special interest in history, I used to visit the library regularly so I have learnt where to find my books and in which sections they were located'. (IHD1)*

Based on this statement, it seems that the historical nature of the topic increases the demand to use the library, as the student needed to access the main sources to obtain background information about the selected topic, in addition to secondary sources.

**Information sources and resources used:** The students tended to seek information sources and resources that were readily available and that met their information needs. The

participants' accounts in this case study indicate that all students tended to use the following:

**1. University libraries:** The university libraries were identified as the first source used by three students (IHD1, IHD2 and IHD4) at this stage for finding background information to develop their research proposals. A short conversation between the researcher and one of the interviewees provides evidence about the active use of the university libraries.

*'Researcher: Where did you search for your information resources?'*

*'Interviewee: I searched for them in the university libraries.'*

*Researcher: In which form?'*

*Interviewee: As books.'*

*Researcher: And you found them in the university libraries?'*

*Interviewee: Yes ... because history is my area and I am familiar with it, I know where to find books on my topic and where they were located and on which shelves they are'. (IHD4)*

It seems that the historical nature of the discipline made the students heavy users of the library. They felt that library use was assumed to be part of what it means to be a historian. Their familiarity with information resources related to their subject area made them active users of the library. All the students at this stage confirmed that they used the Central Library more than the Arts library, as it had a richer collection relating to their field as well as archival materials. One student stated:

*'Let me tell you, before we go any further, that 75% of the books I needed were available in Jaber Al-Ahmed Central Library. As I said, I started my reading with Islamic history books, such as explorer books'. (IHD1)*

To complete their proposals, students needed to use both primary sources and secondary sources available at both university libraries. The examined data shows that the Islamic history students tended to use the following:

**A. Primary sources:** These are actual records of the time, such as photographs, paintings, manuscripts, maps, artefacts, clothes, documents, etc., that are unique and irreplaceable

resources usually found in archival institutes. Published historical work, such as historiography books and travellers' books are also considered primary sources in this discipline.

**Historiography books:** These contain the accounts of the past by authors who were alive when the event took place. These books are available in both the Arts Library and the Central Library. One female student commented:

*'In the Islamic history field we are expected to use primary sources, such as Al Tabri's history, Ibn Al Ather ... these books are available in the Arts Library'. (IHD1)*

**Travellers' books:** These contain information about countries that was documented by travellers who visited some places in those countries, and wrote about what they witnessed at that time. These books are also available in both the Arts Library and the Central Library. One student stated:

*'To select the city, I started to search in books, mainly explorer's books, such as Ibn-Battuta, (Islamic traveller books)... those books are primary sources and they have interesting information about cities ... I searched for them in the Islamic history section in the Arts Library'. (IHD1)*

**Manuscripts:** These are any original hand-written materials. Due to the historical nature of the discipline, the students need to use these types of original documents. All the students at this stage confirmed that they needed to search for manuscripts as primary sources to fulfil their needs. One student commented:

*'I needed Persian manuscripts but the library does not have any. I went to Jaber Al-Ahmed Central Library and visited the manuscript section on the top floor. There is a librarian in charge of this collection. I think I asked him about manuscripts. He said the library did not have any on this topic'. (IHD2)*

It should be noted that this type of primary source is available as part of a special collection in Jaber Al-Ahmed Central Library but is not part of the Arts Library's collection. When the students needed this type of primary source, they had to physically visit the Central Library to read them using a microfilm reader. They were able to obtain a copy of the required information source either in CD ROM or print format.

**B. Secondary sources:** These are works that interpret or analyse a historical event. They are accounts of the past created by people writing about the events after they happened and include monographs, journal articles, theses and dissertations, films, literary works, and reference works, such as dictionaries, encyclopaedias and biographies. These sources are not unique and can be replaced if lost or damaged.

**Print books:** All the students in this discipline confirmed that they relied heavily on print books as a basic source of information. Therefore, they used the library's book collection to search for information related to their specific research topic. One student stated:

*'Primary sources are significant for building up the discussion, but I used monographs to learn how to write the introduction. I mean, I needed to learn how to present the information in my introduction ... I collected initially 15 books from both the secondary and primary sources available in the library'. (IHD1)*

**Reference works:** These are book or serial publications in which one can find confirmed facts and are usually used to find a particular piece of information quickly. All the students in this stage confirmed that they needed to use various types of reference materials for different purposes. One student commented:

*'The primary sources, such as Al-Tabri and Ibn Al Ather (traditional Islamic historiography books), were written in a very different style ... Some words can be very important but at the same time can be very difficult to understand. In this case, I should use a dictionary to clarify the meaning. A lack of understanding about the meaning of words will make understanding the event and historical actions very difficult. Therefore, using dictionaries to clarify the meaning is very important'. (IHD1)*

Another student who could not find enough information resources in Arabic about his topic, because it has to do with Persia, confirmed that he used encyclopaedias to search for information. He stated:

*'I searched in the Encyclopaedia of Islam but could not find what I was searching for. I raked up everything in the library; I browsed every available resource'. (IHD2)*

The same student confirmed that he used the biography book collection to search for information related to his topic. He stated:

*I used biography books ... to understand the background of the men who had a specific influence on the historical development of specific issues. I used biography books to learn about some people's biographies ... biographical books are always available in all libraries'. (IHD2)*

**Print journal articles:** The students needed to use the library physically to search for Arabic journals in their subject area, as they are available in the library only in print format. They regularly searched for back issues of the journals in their field. One of the students confirmed that she searched for print journal articles to develop her proposal. She stated:

*'Of course, I need to search for articles in academic and scientific journals; it is part of my duty as a researcher ... I consulted a few academic and scientific journals in the library but could not find much information. I was able to find a few lines but could not find an entire article ... You know, in our field, we depend mainly on books to search for information'. (IHD1)*

It should be noted that this type of secondary source is available in Jaber Al-Ahmed Central Library and is not part of the Arts Library's collection. When the students needed this type of secondary source, they had to physically visit the Central Library to read or photocopy articles useful to their research.

**E-journal databases:** One student confirmed that he used the library website to access the subject-specific database to search for foreign journal articles related to his topic. In order to undertake the background reading, the student also used some multidisciplinary Arabic databases to fulfil his needs. He stated:

*'He [one of the academic staff] directed me towards important databases, such as JSTOR ... Anyway, I was searching only for titles and JSTOR includes them. There are also a few Arabic databases which are provided by the Kuwait University libraries' website, bearing in mind that the Arts Library and the university libraries' administration had different types of Arabic databases providing students with different types of information resources on different topics.' (IHD4)*

**Theses and dissertation:** Two students (IHD2 and IHD4) confirmed that they used the library thesis collection to track references that might prove useful for their research. One student stated:

*'I reviewed a dissertation completed by a previous student to learn which information resources she used. I also checked how she structured her project'. (IHD2)*

**2. Non-university libraries:** Students in this discipline can gather information they need from a wide range of libraries. All the participants confirmed that they used other libraries to find information related to their specific topic that was unavailable in the university libraries. One student reported:

*'If I did not find what I was searching for, I would head to the public library which has all types of books.'* (IHD1)

Another student confirmed that he used another archival institution to search for the primary sources related to his specific topic. He stated:

*'I visited the Islamic Manuscripts Administration; there are two - one located in [...] and another located in [...], I asked the staff, who assured me that there was nothing related to my research topic'. (IHD2)*

**3. Google and websites:** Using the Internet search engine Google and websites was mentioned by all the students at this stage, who confirmed that they used these to search for information in the form of e-books or e-journals. Because many Arabic websites on the Internet provide journal articles or books in pdf formats for free that are easy to download and save, the students in this discipline tended to download books and journal articles related to their topic. One student stated:

*'Using Google through the Internet simplifies the process. Most of the Arab writers do not code their papers and there is no restriction on access so I was able to access the articles I needed. Also, the journals published by respected Arabic organisations were all freely accessible. In one of these journals, I was able to find very useful articles written by very well-known scholars. I was able to collect and save over 23 articles related directly to my topic'. (IHD3)*

Another student stated:

*'I used Google to access the [...] site from which I can download free books. On this site, I searched for Iranian history books, which focus on my studied era.'* (IHD2)

**4. Their personal collections:** The students in this discipline tended to build private collections of books from the very beginning. Therefore, they already had a collection of

primary sources that was handy and easy to access. Three students (IHD1, IHD2 and IHD3) at this stage confirmed that they used books they already had in their personal library to develop their proposal. One student stated:

*'Some of the primary sources which are available in the library I already have in my personal collection at home. Those I didn't have, I searched for in the university's central library and the Arts Library'. (IHD1)*

The nature of the research in this discipline is theory-based, but the professors encouraged their students to seek advice from specialists in their research area regarding what to read.

**5. Specialists in the field:** Two students in this stage (IHD3 and IHD4) confirmed that they personally contacted subject experts, either to seek their advice about what to read or to use resources from their personal collections. One student commented:

*'I consulted a number of well-known scholars who provided me with the required advice. One of the scholars was very interested in my topic and invited me to visit his personal library any time to search for information. He has a nice, valuable collection containing most of the resources I needed. He has a great information resource collection related directly to my topic, which proved very useful in building up my knowledge about the topic'. (IHD3)*

It seems that the students in this stage tended to collect their information from different sources, either from university libraries, other libraries, Google or their own personal collections. They were also encouraged by their supervisor to contact experts in their area of speciality to meet their needs.

To sum up, the students were required to select an original topic. To achieve this, they used university libraries as their first information channel to search for primary and secondary sources. Students in this discipline were active users of the library. The historical nature of the discipline demands the use of primary sources, such as manuscripts, which are not part of the Arts Library collection. Therefore, they needed to contact the archival department at the Central Library to meet their needs. They used primary sources as a basis for their research and made heavy use of secondary sources. In addition, they tended to use public libraries and other special libraries to fulfil their needs. History students were encouraged by their professors to seek advice and support from specialists in their field. A positive attitude about using Google as an information source was expressed by most of the students. They tended to download Arabic e-



books and e-journal articles for free from the Internet to fulfil their needs. They had a positive attitude from the very beginning about building their own personal collections that they could refer to whenever necessary. Therefore, the students at this stage tended to use various information sources to fulfil their needs.

## **Stage 2: Mid-stage (data collection, data analysis and writing up)**

The accounts provided by history students engaged in the second stage indicate that the nature of the topic has no influence on the role of the library, as the students had already agreed on the uniqueness of their topics with their supervisor and then familiarised themselves with other information resources relevant to their selected topic, as acknowledged by all the students interviewed.

- **Information sources and resources used:** At this stage, the students started to gather more specific information related to their topic. During the information gathering process, the students extract information from the source and write it down on cards. Afterwards, the process of organising the information begins, followed by the writing-up process in parallel with the analysis. As their research is based on the inductive approach, a non-linear research process was identified in this discipline. Therefore, the students needed to search for more information resources when drafting their thesis. One student stated:

*'I collected the information I needed from the four main primary sources I mentioned earlier, then started my writing up but, at the same time, I completed searching and reading for more information ... I browsed each book separately ... I read the chapters word-for-word. Once I had found the information that I needed that was related to my topic, I wrote it down on cards. In this way, I was able to gather a massive number of cards from different information resources ... I spent 18 months, I think; collecting information' (IHD7)*

Islamic history professors value primary sources, such as historiographic works, as a core sources to build up the main body of the students' theses. Therefore, students first started collecting information from primary sources as a basis for their research. Due to the nature of the discipline, historical information is hard to track down. Therefore, the students tended to spend a long time gathering information to satisfy their research needs.

The same student added:

*'I covered most of the primary sources available in our college library ... I was able to find these primary sources in the Arts Library but there were a few more that I couldn't find'. (IHD7)*

Traditional historiography books are available in the university libraries as part of their book collections. These books are available as a series of volumes and cannot be borrowed. Therefore, the students either review them inside the library or photocopy the part related to their research topic. In this case, the students tended to use the following:

**1. The university libraries:** All the students at this stage admitted that they used Jaber Al-Ahmed Central Library more than the Arts Library, as they needed to access its archival materials and its book collection. One student commented:

*'In Jaber Al-Ahmed Central Library, I found primary sources which cover the political aspects of my research but the information about the social and economic aspects was very limited ... To be honest, the university libraries were not very useful, so I had to find them via external channels'. (IHD8)*

Three students in this stage (IHD5, IHD7 and IHD8) also confirmed that they accessed the Central Library to use its archival collections, such as manuscripts. One student stated:

*'I used manuscripts from Jaber Al-Ahmed Central Library at Kuwait University. They provided me with the manuscripts which I needed, in the form of a CD ... I benefitted from the manuscripts division in the library to support my research. I used three manuscripts as a reference for my study'. (IHD7)*

Another student confirmed that the special collection of this library did not fulfil her needs.

*'Such information resources are very important in our field but I could not find any useful ones in the Central Library of Kuwait University. There are many manuscripts but they are not relevant to my topic'. (IHD8)*

**2. Google:** All the students at this stage, except for one (IHD5), confirmed that they used Internet tools, such as Google, to search for books, access museums websites, use online dictionaries or download books. One student stated:

*'I found a few images on the Internet but I needed to go back to the primary sources to check if they were available ... I downloaded a few books published as pdfs, using Google, such as ... downloading it for free and ... I found it very useful'. (IHD7)*

During the analysis process, the students had to go back to the primary sources to check if the information collected from secondary sources, such as images, was reliable.

Another student visited museum websites on the Internet to search for images:

*'I visited museum websites. I searched for images on the Internet using Google and copied them ... I found images showing women's dresses and clothes'. (IHD8)*

The students at this stage used the Google search engine for different reasons, either to find images related to their topic or to download books for free. However, none of them confirmed that they used Google to search for journal articles.

**3. The supervisor:** All the students at this stage confirmed that they were guided by their supervisor through all the research stages when they struggled to find information related to their topic. One student stated:

*'I still need a few manuscripts; my supervisor told me that I would be able to find them in Egypt. Therefore, I have to travel to Egypt to look for them.' (IHD8)*

According to one interviewee, the following is the case:

*'My supervisor told me that in Egypt I would be able to find many books that include images ... in the university libraries, such as Cairo University Library and Alexandria Library...'. (IHD5)*

It seems that the students in this discipline face difficulties tracking down particular primary sources. Therefore, their supervisor was the most commonly consulted source for valuable advice concerning information resources.

**4. Personal collections:** Two students at this stage indicated that they used some information resources from their private collections to fulfil their needs. One student commented:

*'Some primary sources I have in my personal collection to avoid wasting time visiting the library'. (IHD7)*

Another stated:

*'In my personal collection, I have an Islamic Atlas which includes maps relevant to my topic. I also reviewed maps provided by some books as Appendices'. (IHD8)*

**5. Travel:** Due to the historical nature of the discipline and according to the demands of the analysis process, at this stage, the students may need to travel from their home institutions and sometimes go abroad to validate their theory or hypothesis. All the students at this stage confirmed that they had been advised to travel to access needed resources. One student said:

*'In the information I collected, Egyptian clothes were decorated with animal drawings before Islam. However, my dissertation is about social life in Egypt during the Islamic era, and he [the author] mentioned that what supports his statements was manuscript number (...) which is held at the Museum of Antiquities, Cairo. In this case, I will look for this manuscript in Kuwait University Library (Jaber Al-Ahmed Library) to prove the existence of drawings of animals on Egyptian clothes in the historical period before Islam to verify the validity of this information. If I can't find that manuscript in the library, I'll go to Egypt, find this manuscript, photocopy it and attach it to the appendix of my dissertation'. (IHD5)*

**6. Specialists in the field:** Two students at this stage (IHD5 and IHD8) stated that they contacted specialists in their subject area either to seek their advice or to request some of their publications relating to the students' areas of interest. One commented:

*'I was able to contact Dr [...] from Jordan, who is an expert on my research area, and communicate with him ... He supplied me with an article he wrote ... Another expert in Egypt I could hardly reach due to the political conflict Egypt was experiencing ... sent me his article by post ... Another expert promised to supply me with a book I asked if she could find'. (IHD8)*

Not only are specialists in the field used as sources of information by the students at this stage but so too are the academic staff. The same student added:

*'I communicated with many members of academic staff ... Some supplied me with a few books, two I think ... I contacted them by telephone and they supplied me with the books by post'. (IHD8)*

**7. Book publishers and book stores:** At this stage, two students confirmed that they contacted book publishers or book stores to order the books they needed. One student stated:

*'Now, I am a regular customer of Ibn Qutibah (commercial) library here in Kuwait. I have their phone number and ring them every time I need to buy a book to check if they have it or not ... Frankly, the book I got from the [...] libraries helped me a lot and my supervisor admitted that I had made a great effort to find this book'. (IHD7)*

Another student contacted a publisher to meet her information needs:

*'Because I couldn't find what I was searching for, I contacted many publishers, especially those with good links with Egypt ... My focus was on the Anglo Egyptian Library, which has published many important books on my research area. The library publishes old and rare books. I bought many books and reviewed them'. (IHD8)*

**8. Talking to people:** The interaction between primary materials and the research literature through the analysis process often leads to a revision of the working hypothesis. This requires students to search for different types of information. One of the students at this stage confirmed that she needed to talk to experts to address one facet of her research topic:

*'Part of my research is studying social events, such as parties, holidays and the food served at such events as the feast ... While I was drafting my first chapter, I requested information about Jewish and Christian holidays. I wanted to meet a priest from the church to ask him about their holidays or whether the church had any books about the holidays of the past'. (IHD7)*

From the evidence above, it appears that the students at this stage concentrate on more than one information source—those that were accessible and readily available in addition to the university libraries. Although the students during this stage mainly used their personal research collections, searching for information in this discipline did not take place during one stage but continued throughout the research process. In searching for information available at the university libraries, the students tended to use the following:

**a. Encyclopaedias:** One student at this stage confirmed that she needed to use reference works, such as encyclopaedias:

*'I used the Islamic Encyclopaedia ... It is arranged in alphabetical order, so I was able to search by name. Once I found the article I needed, I photocopied it, and read my copy at home'. (IHD8)*

**b. Dictionaries:** As the primary sources are written in ancient Arabic and are hard to understand, the students in this discipline needed to use an Arabic dictionary to clarify the meaning of certain words. All the students at this stage confirmed that they needed to use dictionaries as a secondary source to meet their needs. One stated:

*'For example, to identify the weapons they used in battle and the women's clothing ... I had to use dictionaries to understand the meaning of each part of the clothes... what they called a scarf, what they called a dress, and so on'. (IHD8)*

**c. Arabic Literature:** Two students in this stage (IHD6 and IHD8) who could not find enough information resources related to their research confirmed that they used the poems and tales available in Arabic literature to fulfil her needs:

*'Information related to social life can be found in the Arabic literature; in poems or tales ... I searched for information in the Arabic literature, such as poems, novels and also biographies'. (IHD8)*

**d. The library's thesis collection:** In order to track down the references related to their research topics, two students at this stage (IHD6 and IHD7) confirmed that they needed to use the library's thesis collection:

*'I read a Master's dissertation written by a previous student who studied [...] state but who focused on a different angle. It was very useful to me because it was able to direct me to the primary sources he used and I searched for them via the library'. (IHD7)*

**f. Maps:** Three students in this stage (IHD5, IHD7 and IHD8) confirmed that this kind of primary resource was important for their theses. The historical nature of this discipline requires the use of this type of information resource, which is often provided in historical monographs. One student stated:

*'I needed also a monuments' book; the book's title was monument studies... The main topic of the book is the pilgrimage route between Baghdad and Mecca. It is academic research and the information presented in it could not be found in the primary sources ...*

*I was very lucky; the book has a map and plan of the route. I found in the books many of the maps I needed ... I will include all of these in my appendix'. (IHD7)*

In summary, the students at this mid-stage relied heavily on other available resources in addition to the university libraries. To complete the gathering of information to perform the analysis and support their arguments, the students used various sources, such as their supervisors, professionals in the field, publishers and books stores, Google, their personal collections and travel to access resources. In order to complete their theses, they needed to visit the library regularly to utilise its services and materials, including the thesis collection, reference works, Arabic literary works, maps and the library database to fulfil their needs.

### Stage 3: Reflections on students' experiences

The same factors appeared in the proposal development stage.

- **Historical nature:** The originality of the topic based on the historical nature of the discipline was identified in this stage by two of the respondents (IHD8 and IHD12) when they complained about the library's lack of primary sources relating to their topics. One student stated:

*'My topic is the role of women during [...] era... As a student of Islamic history, I am expected to search first for primary sources of information such as Al-Tabri and Ibn Kathir, which are available in the university library ... The primary sources reflect the political perspectives of historical events, so the role of women is not clearly defined ... Even the important information sources discuss the political events of that era more than anything else, so the primary information sources did not satisfy my information needs'. (IHD8)*

According to the students' experiences, the nature of the topic dictated which source of information they used to meet their information needs. Regarding the originality of the topics, the library was unable to meet the students' specific information needs.

- **Information sources and resources:** All the students at this stage reflected on their experience of building their research-related collection. According to one student's experience, the history students habitually built considerable private collections from the very beginning and continued to do so throughout the research process. The student suggested that the library might arrange an exhibition to help students to enrich their personal library with the valuable books they need. This student stated:

*'As far as I know, most students wish to create their own personal collection. It'd be useful if the library organised an exhibition; it could be yearly and they could invite publishers who are interested. Such events would be very useful and would save students time and money'. (IHD11)*

It seems that the students in this discipline greatly value their personal collections, which grew throughout the research process, and that their use of the library decreased.

To sum up, the nature of the topic controlled the type of information sources and resources used. The historical nature of the discipline influenced the nature of the topics, which in turn influenced the types of information sources used. In addition, the demands of each stage affected which information sources the students needed to use to fulfil their needs.

Finally, regarding the findings about the nature of the discipline, it can be stated that:

- The more original the topic, the less dependent on the library resources and services the students will be (stages 1 and 3).
- The more sources of information available, such as Google, personal collections, the less the library's information resources will be used to build students' proposals (stage 1).
- The greater the demand for information to complete research projects, the more library resources and services the students will use (stage 2).
- The greater the students' tendencies to build their own personal collections, the less use of library resources there will be (stage 1 and 3).

### **7.3.2 Information needs**

In this case study, the information need of the students identified in the data was the need to use specific sources of information to complete their research. IT tool needs was the only cultural element identified that shaped the students' information needs, as discussed further below.

#### **7.3.2.1 IT tool needs**

In terms of IT tools, the examination of the interview data revealed that students' IT tool needs influenced their interaction with the online library services. In the previous section (7.3.1.2), the participants described a variety of electronic information tools they use, including Internet search engines, websites, specific CD-ROMs, online journals and OPACs. As the old



information they needed was not easy to track and takes a long time to collect, the students adopted IT tools to save them time and effort. As their research progressed, so their need to use online information tools developed. This element is discussed in association with using online search aids for each research stage, as follows.

### **Stage 1: Proposal development stage**

The students in this stage need to check the availability of the information resources relating to their topics in the library before making their final decisions. As they mainly search for books, they need to use the library catalogue to find what they need. Most of the students at this stage confirmed that they browsed the shelves or used the library's card catalogue but made less use of the online catalogue. Two students at this stage (HID3 and HID4) confirmed their use of the library online catalogue in addition to using the card catalogue or browsing the shelves. One stated:

*'I prefer to use the shelf method ... if I search on the shelf, I can review the book at the same second. Anyway, I know that the book exists in the library and I know how and where to find it. I might fail when using the system and I used both the electronic catalogue and browsing the shelf to find my books'. (IHD4)*

Two students (IHD1 and IHD2) appeared to have a lack of knowledge about the online catalogue or how to use it. Therefore, they tended to use the card catalogue or browse the shelves. One student stated:

*'I do not know how to use it [the online catalogue], I used to use the manual catalogues'. (IHD1)*

It seems that some of the students at this stage lacked knowledge about electronic information tools provided by the library and how to use them. Some preferred to use other methods along with the online catalogue, such as browsing or the card catalogue, to check the availability of information resources related to their topic. In other words, the less preference for or knowledge of the available IT tools the students have, the more dependent they will be on the library's conventional tools to meet their needs.

### **Stage 2: Mid-stage (data collection, data analysis and writing up)**

As the students became involved in their research projects, they became more focused on their topics and their information needs became narrower and more specific. Therefore, they became

more aware about what information resources they needed to use. In addition, they became more familiar with the library collection. One student commented:

*'I know on which shelf the primary sources are located. Such books are unavailable for external loan. Either I sit in the library and read the book, or I photocopy the pages I need... To tell you the truth, now I have very clear knowledge about which information resources in my field are available in the library. I know now all of the relevant information resources for my topic by heart'. (IHD7)*

As the demands of the research process grow, more searches for information are required. Therefore, students at this stage need to use IT tools, such as the OPAC, to locate information resources quickly. Three students at this stage (IHD5, IHD6 and IHD8) confirmed that they used the library online catalogue to search the library collection. When asked how she found the books she needed in the library, one student stated:

*'I search for them using the library catalogue... The online catalogue. I search by the title or name, then the computer will indicate where I can find it'. (IHD8)*

They need to use not only the online catalogue in this stage but also index for online bibliographic manuscripts to locate primary sources in the form of manuscripts. Three students at this stage (IHD5, IHD7 and IHD8) confirmed that they used this index. One stated:

*'The library has an electronic bibliographic index for manuscripts; I searched the index using the manuscript's title'. (IHD5)*

From the discussion above, it seems that the students IT needs developed as their research progressed. As the pressure of the research process increased, the students tended to use faster tools to save them time and effort. Therefore, their use of IT tools provided by the library increased. This means that the more IT needs develop, the more online library services will be used.

### **Stage 3: Reflections on students' experiences**

Concerning the students' own experiences at this stage, the same issues that appeared in the previous stages were also mentioned for this stage. The students' need for electronic information tools provided by the library developed during their research stages. As one student commented:

*'At the beginning, I started searching using the author's name or the book's title as a keyword to search for information. As I became more familiar with the topic, I started to limit my search to the period and date ... As the project progressed, I needed to use more information resources, including foreign and Arabic books, so I started to use the other features provided by the catalogue ... I used the media index to find different types of media and articles ... I was able to access the electronic catalogue via the university's website so, instead of using the physical library to search only for books; I used it to search for books and articles as well as different types of information resources'. (IHD10)*

Another student reflected on his experience using the manuscripts' bibliographic index, as follows:

*'Well, there is a bibliographic index of manuscripts available on the library website. When I searched for manuscripts related to my research topic, I used this index. I took the code numbers of the manuscripts, gave them to the librarian in charge of them and asked him to provide me with the manuscripts ... What was interesting was that they could provide me with a paper copy of the manuscripts if I needed one. Moreover, they can provide me with the copies I need in the form of a CD. Using the manuscripts on the CD facilitates the process of reading and studying them. If I need a printed form of the manuscript, I can print one out'. (IHD9)*

To sum up, IT needs had an influence on the students' interactions with the library's online services. Throughout the research process, the students' IT needs developed as the demands of each stage increased.

In light of the findings for each research stage, it can be stated that:

- The less preference for or knowledge of the library's IT tools students have, the more dependent they will be on other conventional tools to find library information resources (stage 1).
- As the students' IT tool needs develop, their use of online library services increase (stages 2 and 3).

### **7.3.3 Study mode**

The Islamic history students were enrolled as either part-time or full-time students. The students' study mode is identified from the data as a variable that influences their interaction

with the library resources and services but not the research process itself. Two elements that were influenced by the study mode culture emerged: availability and accessibility. These two elements are discussed in Sections 7.3.3.1 and 7.3.3.2 below.

### 7.3.3.1 Availability

The availability of the students and the availability of the library resources and services are two issues that have emerged relating to the element of availability. These two issues are discussed below.

- **Availability of students:** Part-time students were less able to be on campus during the daytime due to their jobs, while the full-time students were often on campus. Some of the library services offered to the students were only available from 8:00 am to 1:00 pm, such as photocopying services, so they were unable to benefit from these services. One part-time student stated:

*'[They could] provide us with photocopying services all day long, especially in the evenings. Because the photocopying services are available in the morning and I am a part-time student who works in the mornings and studies in the evening, I have no time to come in the morning to use the photocopying services, and when I come in the evening, I can't use them'. (IHD9)*

A short conversation between the researcher and a full-time student in the final stage confirmed that the students' ability to be on campus enabled them to use this service. The interviewee stated:

*'[...] I also used the photocopying services to photocopy articles and books ... Here was a member of staff in charge of the photocopying services in the library. He helped me and did the photocopying ... He was always available but not during the afternoon ... I did most of the photocopying in the morning and the member of staff was there to help'. (IHD10)*

It can be noted from the above that the availability of full-time students on campus during the daytime saved them time and increased their ability to build a relationship with the library, while part-time students, due to their work commitments, were not able to be on campus during the daytime and so could not use all the services offered by the library. Therefore, the less time students had on campus, the less they used the library resources and services during all research stages.

- **Availability of library resources and services:** The data shows that the inability of some students to be on campus made them unable to access the library's online resources, such as databases, because this service is unavailable remotely from home; however, they often accessed these resources on campus. When asked if he knew how to use the JSTOR database, one part-time student stated:

*'I do but not very well. To me, searching the JSTOR was quite a complicated mission ... I was too busy to come in the early morning and was only free in the afternoon ... I could only review the titles available on JSTOR related to my topic to gain a general understanding'. (IHD4)*

A full-time student said:

*'I used foreign language articles; I did not find any difficulty seeking information resources from the library database because, whatever I needed, I was able to download without trouble... My supervisor directed me to a database called JSTOR, I think. I was able to download and access foreign information resources via it'. (IHD8)*

As the online catalogue provided by the library can be accessed remotely, the part-time students could use this service to search for books when unable to visit the campus. Not only can the students search for books but they can also use the reserve service. One full-time student stated:

*'I was also able to access it from home. I reserved books then went to the library to collect them ... If I was searching for the books from home, I would reserve them, but if I was in the library I would collect it immediately'. (IHD8)*

Therefore, we can see that the availability of full-time students on campus enabled them to use the online services provided by the library, such as the online database, more than the part-time students. The inability of part-time students' to be on campus during the daytime reduced the benefit of this service for them, as they could not access it from home. Therefore, their interaction with the library was influenced by the availability of the library online resources more than anything else. In other words, the more available remotely accessible information resources there are, the more the library will be used.

### 7.3.3.2 Accessibility

The analysed data reveals that the inability of part-time students to be on campus during the daytime prevents them from accessing the library's online databases, as these are unavailable off campus, while full-time students can access this service either from the library or remotely on campus. Many issues emerged related to how the accessibility of the library resources and services influence the role of the library, as follows.

- **Access points:** Library access points for online resources and services are provided on campus for graduate students. The library databases cannot be accessed off campus remotely. Therefore, part-time students cannot benefit from this service due to their inability to be on campus during the daytime. One part-time student emphasised the need for information access to enable students to benefit from using this service remotely from home:

*'I think that Master's students should be given a user name and password to be able to access information resources from home ... [This] will save them time travelling to the library and also allow them to search for information and access information comfortably from their own home.'* (IHD11)

As the Islamic history students tended to use Arabic books provided by the library in hard copy format, they had to physically visit the library to access these books, either as primary sources or secondary sources. To search for or reserve these books, both the part-time and full-time students could access the online library catalogue from home. The same student stated:

*'I can't ignore the important role of the physical library, as 90% of research work requires the use of the library. The other 10% needs the online catalogue which can be used only to simplify the search for information and reduce the time needed to find information.'* (IHD11)

To search for manuscripts available in the Central Library, students used the manuscript bibliographic index provided via the KULA website. The students can search it to find what they need and can also access it from home. As one part-time student commented:

*'You can search for them [manuscripts] ... in the electronic index, but the problem with this is that it provides the researcher with no more than the title of the manuscript and a brief abstract, if the library could provide us with a complete e-copy of the manuscript*

*that would be very useful ... I could then access this index and search for the manuscript from home'. (IHD12)*

It can be noted that as the library access points to its online databases are provided only on campus, there is less use of its resources and services among graduate students. However, a greater use of library online finding aids among students in this discipline was identified from the analysed data. It is important to note that the less access the library provided to its collection, the less its resources and services were used. This is true for each research stage.

- **Library restrictions:** The library restrictions on some of its services and resources can limit the use of the library by the graduate students. Some restrictions are placed on photocopying books that cannot be borrowed. As one part-time student in the mid-stage stated:

*'Historiography books are huge, so a structured chapter can be over 1000 pages long. It is a great challenge to find the required information in this massive number of pages during a limited period of time... Photocopying chapters are not allowed, so I must photocopy only a very limited number of pages.'* (IHD6)

Another full-time student in the final stage commented:

*'The library places a restriction on loaning these collections outside the library'.* (IHD10)

It can be noted that as the library places greater restrictions on accessing its resources and services, such as the thesis collection and photocopying service, the less the graduate students use them. This also applies in general to its resources and services and is true for every research stage.

- **Foreign source language barrier:** As the programme's language of instruction is Arabic and the students were native Arabic speakers, most were unskilled in foreign languages. Islamic history covers other, non-Arabic regions where the mother tongue is not Arabic (e.g. Persian, Hindi and Turkish). If students lack knowledge about these languages, they will be unable to access the historical books written in these languages. As one of the students in the first stage commented, his supervisor advised him to change the topic he had chosen because he would be unable to understand the relevant sources due to his lack of knowledge of the regional language.

*'My supervisor was always able to advise me ... I will give you an example; I wanted to study Ottoman history. He advised me that tackling such a topic would not be easy because I would need to understand the ancient Turkish language to be able to understand the main sources of information'. (IHD4)*

Another student, whose topic related to the Persia region, confirmed that he needed to use a translation service to be able to access the books related to his topic:

*'Most of the information resources on my topic are available in Persian but not in Arabic ... I had to buy the books online then send them to professional translators who translated their content into Arabic'. (IHD2)*

A female student in the mid-stage confirmed that she used only translated books available in the library because she lacked knowledge about the languages of the region she was studying.

*'I use only the translated books available in the library; [...] I found Persian books while searching the Internet ... I have a friend who studied Persian specifically to complete her Master's degree; I might seek her help. My supervisor suggested doing the same but ... I cannot do that. It takes time to learn a language to the required level to understand books'. (IHD8)*

In this case, the students need translation services so that they can access historical books available in other foreign languages. The students interviewed for this case study confirmed that they had no knowledge of foreign languages and needed time to learn the specific historical languages related to the non-Arabic region they were studying. Therefore, the library should provide translation services to enable students to access these resources. As one student in the final stage recommended:

*'I think the library should ... provide students with translation services for certain languages, such as Chinese, Hindi or Turkish. The library doesn't provide such services, which makes it difficult for researchers or students to access certain old information resources that are not available in Arabic'. (IHD11)*

In summary, the culture of the study mode influenced the use of the library by the students throughout their research process. The lack of the students' availability and the lack of remotely accessible information resources off campus negatively affected the role of the library. The following issues emerged from the findings of this study relating to the accessibility of



information resources via the library: library access points, library restrictions on these and the lack of translation services that prevented the students from accessing historical foreign language resources.

In light of the findings related to all the research stages, it can be stated that:

- The less available the students are, the less they will use the library services.
- The library will be used more by the students as more remote access resources are available.
- The more library access points provided, the more its resources and services will be used by the students.
- The greater the library's accessibility restrictions, the less the library resources and services will be used.
- The fewer translation services the library provides, the less the library's foreign resources will be used.

### **7.3.4 Students' personal experiences**

In the context of this research, the students' personal experiences reflect each student's perceptions of the library services provided and their feelings concerning their use of its resources and services. The examined data in this case study suggested two elements which helped to shape the personal experience cultural identity. These are performance of library services' and library communication experiences, which will be discussed below, in Sections 7.3.4.1 and 7.3.4.2, with regard to each stage of research.

#### **7.3.4.1 Performance of library services**

Most of the students interviewed for this case study complained about the library's performance, so it is clear that it needs to be improved to meet their varied needs through each stage of the research. One issue related to the performance of library services element identified from the data was insufficient topic-specific information resources. This issue is discussed with regard to each stage of the students' research, as follows.

##### **Stage 1: Proposal development stage**

The students' needs at this stage are limited in terms of finding and searching for the primary sources they need to undertake broad background reading to choose their topics. They also need to access both primary and secondary resources to complete their proposals. The library's

performance during this stage is limited to providing the students with the information resources available. If the library is unable to perform at a level that meets the students' needs, they will search for alternative sources. Two students in this stage (IHD2 and IHD3) confirmed that they did not find enough information sources related to their specific topic. One student stated:

*'I need to search for primary sources. Also, I am searching for books which focus on Iran's history. The Arts Library doesn't have any books on Iran's history, even in the Persian section. I was able to find books which provided general information; most ... were about the history of the Arabic Mashreq (the Eastern Islamic region) but no specific book focused on Iran's history. The university libraries here are very poor on Iran's history and Persian books'. (IHD2)*

Another student whose topic was a Persian city confirmed that the primary sources she needed were available in the university libraries:

*'I used primary historical sources written by Altabry, Ibn Al Athyer, Al-masudi, Alyaqubi (Arabic historiography books). Those are very significant sources of information in our field ... Most of the books I needed were available in the university libraries'. (IHD1)*

Based on this evidence, we can say that the library houses the primary sources related to the history of Islamic regions published in Arabic only. Historical primary sources about Islamic regions written in non-Arabic languages are rare.

## **Stage 2: Mid-stage (data collection, data analysis and writing up)**

As the students read primary sources widely during the first stage, they needed to use monographs and other secondary sources to build their arguments, based on the data collected from primary sources. Nevertheless, if the primary sources needed are rare or missing from the literature, they can use monographs instead, as this student stated:

*'Well, there is one book which includes all of the manuscripts that discussed [...] the state in Egypt. The collected manuscripts were studied and discussed by well-known scholars. Most of the books on history, I mean old books, were studied and explained by these scholars... I did not go back to the manuscripts; I went back to the source book which was written to explain the information in the manuscripts.... I borrowed the book from the library but did not use it. I will use it when I reach the next stage'. (IHD6)*

All the students at this stage complained about the insufficiency of the library's book collection to meet their needs in terms of specific books related to their topics, such as monographs. One student commented:

*'The books available at Kuwait University Libraries seemed general and not specialised, When I looked at the books, I didn't find sufficient information related to my topic, I only found a little between the lines... The resources available at Kuwait University libraries are insufficient to meet my research needs, and I can say that it was able to cover only half of my information needs but not all'. (IHD5)*

Based on the above, it seems that the library needs to optimise its performance to a level that can satisfy the needs of the graduate students in this stage. The students depend at this stage on secondary sources, particularly specialised books in their field. If the library does not extend its book collection to meet the students' needs, they will turn to alternative information sources to fulfil their needs.

### **Stage 3: Reflections on students' experiences**

The same issues noted in stages 1 and 2 also emerged when the students were interviewed about their experiences throughout the various research stages. One student commented:

*'At the beginning, as I wanted to select a topic, I faced some difficulties, mainly the lack of information resources about my topic in Kuwait University Libraries ... I couldn't find information resources relevant to my topic, and there was a lack of information resources. I expected the university libraries to have a rich collection of books, but was shocked when I discovered that the collections were very poor ... When I selected my topic and started writing my proposal, I found four books which I used, then expected to find more later, but unfortunately I did not'. (IHD12)*

The Islamic history students in this stage reflected on their experiences using the library resources and services and recommended possible improvements to the library services. Their suggestions are as follows.

1. Co-operate with the academic staff and the students to assess their information needs.

*'Communicate with Master's students to establish their opinions about and satisfaction with the library services and check the weaknesses, such as a lack of books and which books we'd request ... The library should communicate with the academic*

*staff in the departments and the research students because they are the best ones to ask; they know what they need'. (IHD12)*

2. Increase the library's book collection (primary and secondary sources) to meet the students' needs.

*'I hope that the library will improve its collection to provide us with specialised books in our field. The books on our subject area are insufficient ... I wish that the library would provide us with more primary resources in our field, such as manuscripts, because those available are not enough to fulfil our research needs'. (IHD9)*

The same student added:

*'Also, I hope that the library can provide us with more than one copy of the books so that we can borrow them when we need them'. (IHD9)*

3. Improve the ILL services and reduce the waiting time for requested material.

*'I did not use the interlibrary loan services because it takes a long time. I had to wait for a long time to receive my request and I do not have time to waste ... It'd be great if the library could reduce it from a few months to a few weeks'. (IHD10)*

4. Establish a link between the library and other archival institutions, such as museums.

*'I think a specific link between this library and museums, or maybe other libraries, should be established to allow better accessibility to the information resources you require.' (IHD10)*

Some of the students at this stage reflected on a positive issue related to the library services and its facilities when asked what role the library played in supporting their research. One student commented:

*'The Arts Library provides history students with specific rooms to study in and complete their projects. The rooms are equipped with shelves and books specifically for history students. Sometimes, I spent from 5 to 7 hours in the library working on my research. I was close to the information resources as I needed to complete my work'. (IHD12)*

Another part-time student reflected on the self-service photocopying services as follows:

*'At the beginning and, on many occasions, I had to take the books I needed out of the library and photocopy them but, halfway through my studies, the library provided us*

*with a pre-payment card which can be credited via the computer to be used for photocopying. The librarian, the first time, showed us how to use the machine, and then we started using it by ourselves'. (IHD11)*

In summary, according to the above facts identified for each stage, the performance of library services was perceived as inadequate to satisfy the students' needs, which required a high level of library services. At the same time, the students acknowledged the role of the library in supporting their research by providing high-quality study rooms and a self-service photocopier. If the performance of library services was at a level that could fulfil the students' needs, they might not search for alternatives outside the university. This means that the use of the library services decreases as the performance of its services decreases, as its book collections are inadequate to fulfil the history students' needs.

#### **7.3.4.2 Library communication experience**

The students' communication with the library staff was identified from the data in this case study as one of the most important issues shaping the students' personal experiences. Such communication experiences occurred throughout the research process. This element is discussed as it relates to each stage of the students' research, as follows.

##### **Stage 1: Proposal development stage**

As history students are heavy users of the library's physical collection, interaction with the library staff is essential in helping them to locate materials that are difficult to find. At this stage, the students tended to visit the library and ask the librarian for help if they could not find what they needed. As one student stated:

*'When I was at the university, and after I finished my lectures, it was easier to me to pop into the library and ask the staff. I asked if the library has any articles on my specific topic. The library staff searched on the computer to check if there were any articles related to my topic, and told me that the library did not have any'. (IHD2)*

Not only did the students communicate with the librarian but also with the archival staff at the Central Library. As one student stated:

*'The manuscript section has many professionals and library staff who are able to answer all of the users' enquiries. If the user requests a manuscript, the staff will search*

*the electronic index to find whether the manuscript is available in the library or not. If it is, he will provide the user with a photocopy, as requested.’ (IHD1)*

From this data, we can see that the library staff made great efforts to help when needed, which led the students to develop a positive attitude towards the library.

### **Stage 2: Mid-stage (data collection, data analysis and writing up)**

Although the students collected their main resources during the first stage, they still had to visit the library regularly to use its resources and services. As their research progressed, access to archival materials became essential, so their communication with the archival staff improved. Most of the students in this stage confirmed this. One full-time student commented:

*‘I visited the library regularly every morning because the staff member only works in the morning. They supplied me with a catalogue to search for relevant manuscripts but I couldn’t find any ... The staff supplied me with a file and then allowed me access to the library website to search for the manuscripts ... If I found any relevant ones, the library would supply me with a microfilm to review it’. (IHD8)*

Their regular visits to the library and communication with the staff enabled the students to build a strong relationship with the library. The same student stated:

*‘There was an important book which I devoted great efforts to finding. The system showed that the book was in the library but no one knew where it was. I notified ... the staff of the Arts Library. They searched for me and found the book ... To tell you the truth; they were very good and helpful’. (IHD8)*

The positive reflections based on the students’ experiences of the library services made the students active users of the library. The ability of the library staff to provide help when needed encouraged the students to interact with the library physically. During the research process, students developed a positive attitude towards the library staff as the demand for library resources increased. In other words, the students’ attitudes towards the library improved as they communicated more with the library staff.

### **Stage 3: Reflections on students’ experiences**

The same factors that appeared in the previous stages were mentioned by the students at this stage. As these students had already submitted their theses, they were able to reflect clearly

on their experiences with the library regarding their communication with the archival staff.

One student commented:

*'Jaber Al-Ahmed Central Library has its own specific collections that include manuscript ... I used to search for a manuscript using the title then, as soon as I found it, I'd write the title down then ask the staff to help me to photocopy the parts I needed. If I couldn't find the manuscript I was looking for, I had to inform the staff at least two months in advance and they'd in turn request it from another library. Sometimes, the library may be in another country but they were always able to help ... Also, I used a special machine to review manuscripts ... The machine coordinator, who is based in the library, taught me how to use it'. (IHD10)*

To sum up, in light of the above evidence, the positive image that the students built through their interaction with the library staff during the research process motivated them to use the library. This helped to maintain a bridge between the students and the library. As the students interacted with the library staff regularly, their experience of using the library services increased. In other words, the use of the library increases as the students' communication with the library staff increases throughout the research process.

Ultimately, and in light of the above facts identified for each stage in terms of the students' personal experience, it can be stated that:

- The lower the level of library service performance, the less its resources and services will be used by the students (Section 7.3.4.1, stages 1, 2 and 3).
- The more helpful and friendly the library staff, the more the students communicate with the library to utilise its services (Section 7.3.4.2, stage 1).
- The students' use of library services and resources increases as their communication with the library increases (Section 7.3.4.2, stages 2 and 3).

### **7.3.5 Library information services**

The examined data reveals that the library information service affects the students' use of the library and information resources. Training and support are identified in the data as the most important elements that help to shape the information services provided by the library. This element is discussed across all stages of the students' research in the following sections.

### 7.3.5.1 Training and support

In this case study, training and support reflect the demand for systematic, instructed training to learn how to use the online library services and the other types of information resources and services available. Despite the fact that training sessions are provided for users on request, the examined data has shown that the library has not targeted Islamic history students by offering specific sessions on how to use online library resources. Four issues related to training and support were identified in the data—the promotion of services, library skills training, information skills self-training and supervisor support—and are discussed below.

- **Promotion of services:** Publicity helps to shape the library's information services. Most Islamic history students who participated in this case study acknowledged that they had not attended a systematic training programme designed by the library, as most of their knowledge came either from their graduate level modules, their experience or their self-training based on trial and error. Most of the research participants asserted that they had not received any type of promotional message inviting them to attend a training session offered by the library. When asked if she was aware of any workshops offered by the library, one part-time student in the final stage commented:

*'Did they announce a workshop? No, I didn't hear about that. I'd like to attend this type of workshop, because, to be honest with you, I've no idea how to use the online resources. I never used them to search for information in my life. When I need resources, I ask the librarian, and he shows me how to locate the information online, but I have no experience of searching through them myself'. (IHD9)*

A short conversation between a full-time student in the first stage and the researcher confirmed this issue.

*'Researcher: Did you heard about a workshop provided by the library on how to use the library's online resources?'*

*Interviewee: No, I regularly visit the library but nobody told me about that.*

*Researcher: You didn't see any announcement about it?'*

*Interviewee: No, did they announce it?' (IHD3)*



From the discussion above, it seems that the advertising of library service programmes does not reach all students and is therefore insufficient. Although Islamic history students are enrolled as either full-time or part-time students, the promotion of library services failed to reach them. The library should launch more effective marketing programmes about its services so that all students become aware of them. If the students are unaware of which services are available to support their research, they might not use them.

- **Library skills training:** The students' ability to locate the information they needed in the library quickly and effectively reflects their library skills. The Islamic history graduate students received systematic training to develop such skills, as most of their training took place through compulsory modules. In this case, what notably shaped the training element was module-based training.

**Module-based training:** The Islamic History Department offers instructional programmes that are embedded in a few modules to teach graduate students how to physically locate the information they need in the library. Usually, they cover the library's system of organising materials, the structure of the literature in the field, the research methodologies appropriate to the academic discipline and specific historical resources and search tools (e.g. the library card catalogue, indexes, reference collection, book collection, periodical collection, manuscripts, etc.). This prepares students to make effective use of the information resources available in the library physically. One student at the mid-stage commented:

*'There was a module called 'methods of historical research', through which we learnt how to use the library. In addition, a faculty member took us on a tour to the library to learn how to search for books in the online catalogue ... Actually, I did not know how to search for books in the online catalogue until I became a graduate student'. (IHD5)*

Another student reflected on her experience when asked if she used the library online catalogue, as follows:

*'We studied a module that taught us how to use the library and how to use the card catalogue. I know that using the online catalogue is easy but I have no time to learn how to use it. Learning new things takes time and I have no time to learn to search for information online. Also, the faculty members in our field don't encourage us to use technology ... I always used the card catalogue; new technology is not my preferred*

*way to search for information; that's why I don't like to use the online catalogue'. (IHD9)*

It seems that the History Department prepares students to physically use the library more than virtually, as most of the Arabic historical resources related to this discipline are available in print format. In addition, it can be noted that the history students' information use behaviour is aligned with their professors'. The historical nature of the discipline reflects the extent to which the graduate students and their professors are able to use the new technology in their field. It can also be noted that integrating library skills training into the modules influenced the physical use of the library.

**Self-Training:** It was mentioned earlier that the library did not implement systematic training to improve the students' information skills, as part of their training was based on their own efforts using trial and error. In this case, what notably shaped the training element were the students' personal efforts. One part-time student who searched for foreign resources related to his topic confirmed that he taught himself how to use the online database:

*'I have learnt by myself how to search JSTOR; I made many errors until I learnt it ... I put a word or a title in the search box to search for the information I needed. When the database showed the result, the words I searched for were highlighted in yellow so I was able to find what I was searching for ... Someone told me if you need to know how to use the JSTOR perfectly, you need to come in the early morning to the library to find the librarian who will teach you how to do it'. (IHD4)*

The student used his self-training because the library staff member who could train him how to use the library database was only available in the mornings. Therefore, this student could not benefit from this service because he was unavailable in the mornings due to his work commitment. Another full-time student in the final stage confirmed that she learnt how to use the online catalogue by herself:

*'If I wanted X book, I'd search for its details in the online catalogue then go to the shelf to locate it. Or, if I had the author's name, I would use the name as a keyword and, extract the required book's classification number, then head to the shelf to collect it ... No one taught me but I was able to work it out by myself'. (IHD10)*

From the discussion above, it seems that the students developed their information skills through their own efforts using trial and error during the research process. The library appeared to have little influence on the development of their information skills. In other words, the less training support the library provides the more personal training methods the students will use.

- **Supervisor support:** Throughout every research stage, the supervisor played a role in guiding the students on where to find information resources related to their topic or in introducing them to other sources, such as professionals in the field. Supervisor support is discussed as it relates to all stages of the students' research, as follows.

In the first stage, the supervisor directs the student to where they can find relevant information resources related to their topic and provides training support. As one student in the first stage commented:

*'The role of the supervisor at the stage of selecting the topic is very important because he is the one who is able to ... show the student the correct path ... My supervisor taught me how to search different websites for information ... I searched by keywords ... related to my topic to find articles ... I found only one article which was not very relevant to my focuses. (IHD3)*

Another student in the mid-stage asserted:

*'When I asked him [the supervisor] about a book, sometimes he provided me with useful information about it, such as if it had not been published or if the manuscript which I was searching for was missing'. (IHD7)*

As the language of instruction of the Master's programme in the history discipline is Arabic and not all Islamic history students are able to understand foreign languages, the students had difficulty in translating foreign resources into Arabic. Therefore, the supervisor provided support with translating the concepts related to their research topics in foreign resources. One student in the final stage asserted:

*'My supervisor also helped me to understand the content of the English books in our field so that I could translate the information'. (IHD9)*

In summary, the library information services influenced the role of the library. The lack of effective marketing about the online services provided together with the support role of the supervisor negatively affected the role of the library. The less available the library training

services, the more reliant the students are on their personal efforts to develop their information skills. Integrating library skills training into the graduates' modules positively influenced their physical use of the library.

Therefore, in light of the above findings, it can be stated that:

- The more promotional services a library provides, the more its training services will be used (promotion of services).
- The more library skills training is integrated into the modules, the more familiar the students will be with the physical library resources and services (library skills training).
- The less training support the library provides, the more personal training methods the students will use to improve their information skills (information skills self-training).
- The less support services (e.g. translation services) the library provides, the more dependent the students will be on their supervisor's support (supervisor support).

### 7.3.6 External information sources

In this study, external sources can be defined as those existing outside the university libraries. Across all interviews, external information sources appeared to have a great influence on the library's role in supporting each student's research. In this case, the information sources used were based on the types of topics selected rather than the research process. Travel, the supervisor, Google and other libraries are four issues related to the cultural identity factor of external information sources. These four issues are discussed below.

- A. Non-university libraries:** Most of the interviewees in this case study used other libraries to find information relating to their specific topic that was not provided by their university libraries. As one student reported:

*'At the beginning ... I searched for information everywhere ... I used Kuwait National Library. In this library, the books are general and not specialised about my topic, but I read them to develop a background'. (IHD9)*

Another student reflected on his experience throughout the research process, as follows:

*'I visited public libraries to find the books I couldn't find in the Arts Library. This library doesn't have enough books to cover my topic needs, so I had to visit some other public libraries, hoping to find more books. I used Alawkaf (Ministry of Religious Endowments) Library to search for manuscripts ... I visited private and commercial libraries to search for up-to-date books'. (IHD10)*

- B. Google search engine:** Over half of the students in this case study confirmed that they used Internet tools, such as Google, as external sources. The students used Google to search for different information resources related to their topic, such as books, journal articles, online dictionaries, maps and images. One student commented:

*'I started to use the Internet, mainly Google, to search for documents and ...books which were perhaps not in the university library's collections ... It helped me to find information related to my topic in different places. I reviewed many maps ... and I found images'. (IHD4)*

- C. Travel:** The majority of the students in this case study had travelled or been advised to travel abroad to search for information relating to their specific topics. Due to the historical nature of the discipline, students had to travel to remote locations to access primary materials and sometimes secondary resources for various reasons, such as the following:

- 1. Searching for resources that are unavailable in their university libraries or even locally:** Because of their specific historical topics, Islamic history students face difficulty in finding some or most of the information resources relevant to their research. When the students fail to find the most important resources in their home country, they are advised by their supervisor to travel to where they can find what they need. As one student commented:

*'Some books (monographs) are unavailable in Kuwait; my supervisor recommended that I travel to Egypt, as most of the books are available there. I was supposed to travel to Riyadh; there are many important university libraries'. (IHD7)*

Another student who could not find most of the information resources relating to his topic reflected on his experience as follows:

*'Kuwait University libraries have no more than five books (monographs) related to my topic ... The academic staff and professionals encouraged me to visit Yemen to search*

*for information resources, so I did. I visited the University of Sana's library ... to search for manuscripts ... after Yemen I headed to Riyadh and was able to find all the manuscripts I needed ... Many of the information resources I expected to find in Yemen I found in Riyadh.'* (IHD12)

**2. Seeking advice from experts in the field:** People with experience in the same field know what most worth studying, and what is less important. The students need to consult these experts about many issues relating to their topic to be able to answer their research questions and validate their hypotheses. One student was introduced by his supervisor to another expert to seek his advice. The student stated:

*'My supervisor, who is Egyptian, informed me that I should arrange a trip to Cairo to search for documents stored in the main documentation centre and assured me that he could direct me to professionals who are experts in my area of research ... for advice'.* (IHD4)

Another student who reflected on his experience of travelling to meet specialists in her field commented:

*'I travelled to Egypt to search for books ... I contacted a few academic staff members from the History Department of each university library I visited and they were able to direct me. Also, I contacted many experts in the field who studied important documents; I met them and asked them questions ... I attended a conference for Arab authors of Islamic Studies and sought many of their opinions and advice'.* (IHD10)

**3. Visiting museums to validate the historical information collected:** Travelling to the place where the historical event occurred is important in historical research. History students need to see the evidence with their own eyes and obtain information that is only available at the historic site. One student commented:

*'When I started writing the chapter about social life in Egypt, I noticed a plurality in the clothes that were worn by women at that time. Each researcher has stated specific clothing worn by women in that era. This means that women's clothing was of interest during that era. Therefore, I needed to prove my opinion by travelling to Egypt and visiting some museums that deal with the monuments of that era and taking photographs of the type of clothing worn, to support my opinion, after performing the analysis'.* (IHD5)

Another student reflected on her experience visiting a museum as follows:

*'I travelled to Egypt to search for information about my topic. I visited Cairo University Library and found valuable books about my topic. Then I visited the museum that was affiliated to the library and found an ancient Yamani carpet made during the same historical era which I am studying. This carpet can be used as evidence of the commercial activity at that time in Yemen, but I couldn't photograph it until they made sure that it has been published somewhere'. (IHD9)*

**D. The supervisor:** All the students in this study confirmed that the supervisor provided ongoing guidance and suggestions throughout all the research stages. Only one student in this case study acknowledged that the supervisor also acted as an external information provider when the library failed to meet his/her needs. A student reflected on her experience with her supervisor as information provider as follows:

*'My supervisor provided me with books from his personal collection to develop a background about the political situation in Yemen at that time, and the geographical position of its ports ... My supervisor always provided me with books through his links with other libraries outside the country, particularly the libraries of Sann'a in Yemen ... Because I didn't find information about my topic in my country, the resources are few and inadequate to meet my research needs ... The personal collection of my supervisor is what supports my research and not the library.'* (IHD9)

This element, which shapes the meaning of the external source culture, appeared across every research stage and was identified by one student in regard to a specific type of topic. The students used their supervisor as an information supplier when the library failed to meet their needs, which can influence their use of the library. This means that the more dependent the students are on their supervisor as information providers, the less they will use the library.

To sum up, in light of the above, it has been found that four external information sources were identified in the data for all the research stages. Whilst all the students named the library as a main source from which they seek information resources, they added other libraries, Google, their supervisor and travel as possible sources of information unavailable in the library.

In order to interpret this summary, it can be stated that:

- The more other libraries' resources are accessible, the less the university library resources and services will be used (non-university libraries).
- The more Internet resources available externally, the less contribution the library makes to students' research (Google search engine).
- The less specific information resources provided by the library, the greater the need to travel to seek information from other university libraries (travel).
- The less library-specific information resources available, the more dependent the students will be on their supervisor as an information source (the supervisor).

### 7.3.7 Financial adequacy

This cultural identity factor represents the students' financial capability to pay for the information resources needed for their research. Capability is the only element that was identified in the data as shaping financial adequacy. Students bought their information resources, such as books, when the library was unable to meet their topic-specific information needs and because they had the required funds to pay for them. Across all interviews, this cultural identity factor appeared to have no influence on the research process, but its influence has been identified in terms of the students' interaction with the library.

#### 7.3.7.1 Capability

The students had to buy books related to their specific research topic when the library was unable to provide them, in addition to their preference for buying the main historical books in their field to build their personal collection from the very beginning. This phenomenon appeared across all research stages. In other words, the students bought different types of books as needed when the library was unable to provide them. Over half of the students in this discipline confirmed that they did this. One of the students in the first stage discussed this with the researcher:

*Interviewee: I searched all libraries ... the Sharia'h and Islamic Studies Library and ... Jaber Al-Ahmed Central Library as well.*

*Researcher: What about the Arts Library?*



*Interviewee: No library in Kuwait has them; even the Arts Library does not have them. I searched also in the public libraries and did not find them... I bought some books and I downloaded some free books from the [...] site'. (IHD2)*

Another student in the mid-stage confirmed that he bought a CD library when the university libraries could not fulfil his specific needs:

*'I brought the CD [comprehensive library] for 3 KD and was able to find a list including over 10,000 books ... I was able to find what I had been seeking for six months. I wasted six months searching for what I could have found in a few days'. (IHD6)*

Another interviewee in the final stage suggested:

*'The library should think about supplying ... the required books and manuscripts ... If the library cannot supply us with the books, it can provide us with the titles and offer them in the library and then we can buy them ... I bought many books and was able to create my own personal collection ... Some copies I lend to the university library for future students who might wish to study the same topic'. (IHD12)*

The lack of information resources in the form of books forced the students to buy their own wherever they could find them. If the students had the required funds to pay for the information resources, they would not wait for the library to meet their needs. It can be noted from the evidence provided that financial adequacy is another factor that emerged as having an influence on the students' use of the library.

Ultimately, according to the discussion above, it can be stated that:

- The fewer library resources and services provided, the more the students will depend on their own funds to acquire the information resources they need.

## **7.4 Emergent issues**

This section presents some issues that emerged from the analysed data relating to the Islamic history field that can be considered as a research contribution. These issues relate to the role of the library and the travelling behaviour of the graduate students and are discussed in Section 7.4.1 and Section 7.4.2.

## 7.4.1 Issues related to the role of the library

In this section, several observations emerged that relate to the use of the Arts Library in addition to those in Chapter 5 (Section 5.4.1) and Chapter 6 (Section 6.4.1). These observations follow.

### **For the first stage:**

- There is a relationship between the availability of other sources of information, such as Google and personal collections, and the low use of the library's information resources to build proposals (Section 7.3.1.2, information sources and resources).
- There is a relationship between low preference or the knowledge the student has about using IT tools provided by the library and students' increased dependence on other conventional tools to find library information resources (Section 7.3.2.1, IT tools needs).
- There is a relationship between the good qualifications of library staff and the increased communication of students with the library to utilise its services (Section 7.3.4.2, library communication experience).

### **For all the stages:**

- There is a relationship between the originality of topics and the low dependence of students on the library as an information source (Section 7.3.1.2, historical nature, stages 1 and 3).

#### *Availability issues*

- There is a relationship between the poor translation services the library provides and the low use of its foreign historical resources (Section 7.3.3.2, foreign source language barrier);
- There is a relationship between the availability of library-specific information resources and the increased dependence of students on their supervisor as an information source (Section 7.3.6, the supervisor);
- There is a relationship between the low specific information resources provided by the library and the increased need to travel outside the country to seek information from other university libraries (Section 7.3.6, travel to the source).

#### *Accessibility issues*

- There is a relationship between the availability of access points provided by the library and their use by students (Section 7.3.3.2, access points);

- There is a relationship between the accessibility of other libraries and the low use of the university library resources and services (Section 7.3.6, non-university libraries).

***Information needs issue***

- There is a relationship between the high IT tool needs of the students that develop throughout the research stages and the increased use of online library services (Section 7.3.2.1, IT tool needs, stages 2 and 3).

***Training and support***

- There is a relationship between the low levels of support services (e.g. translation services) the library provides and the increased dependence of the students on their supervisor's support (Section 7.5.3.1, supervisor support).
- There is a relationship between the familiarity of students with the physical library resources and services and integrating library skills training into modules (Section 7.5.3.1, library skills training).

***Communication experience issue***

- There is a relationship between the increased communication of students with the library and their increased use of its resources and services (Section 7.3.4.2, library communication experience, stages 2 and 3);

***Attitudes issue***

- There is a relationship between the increased tendency of the students to build their own personal collections and the low use of the library (Section 7.3.1.2, information sources and resources, stages 1 and 3).

***Financial adequacy***

- There is a relationship between the low amount of specific resources provided by the library and the increased dependence of the students on their own funds to acquire the information resources they need (Section 7.3.7.1, capability).

These observations need to be compared with those of the other three disciplines. Only the most important will be discussed further in Chapter 9.

## 7.4.2 Students' travelling behaviour

Travelling to archives outside the country is a unique characteristic of the history discipline, as the historical nature of this discipline requires searching for ancient information that is not easy to track down. The most interesting issue that emerged from the data relating to some of the participants' behaviour in this case study is that the students travelled outside the country to obtain secondary resources, such as monographs (Section 7.3.6) or expert advice:

*I travelled to Egypt to search for books ... Also, I contacted many experts in the field who studied important documents; I met them and asked them questions... (IHD10)*

It seems that the local lack of specific historical books in Arabic relating to the students' specific topics increased the necessity to travel to seek the information resources outside the country:

*'Some books (monographs) are unavailable in Kuwait; my supervisor recommended that I travel to Egypt, as most of the books are available there. (IHD7)*

The supervisor's recommendations to travel outside the country to seek specific information resources not available locally or to consult an expert in the field also play a significant role in shaping the travelling behaviour of the graduate students in the Islamic history field:

*'My supervisor, who is Egyptian, informed me that I should arrange a trip to Cairo to search for ... and assured me that he could direct me to professionals who are experts in my area of research ... for advice'. (IHD4)*

It can be argued here that the extensive dependence on travelling abroad to search for secondary information resources (monographs) or to consult experts is unexpected. This might be attributed to the local lack of specific Arabic resources relating to Islamic history, the supervisor's behaviour, the culture of the discipline or other factors. Therefore, in the conclusion the researcher will suggest further research to investigate to what extent travelling behaviour to acquire information resources in the Islamic history field can affect the use of the library by graduate students when conducting their research.

## 7.4.3 Information literacy education

The most important issue that emerged from the data analysed relating to the Islamic history field is that graduate students appeared to be familiar with the library's historical resources and were able to locate the information they needed in the library quickly from the very beginning.

This may be because history graduate students take compulsory courses to learn library skills during their Master's programme before they commence their research project:

*'There was a module called 'methods of historical research', through which we learnt how to use the library... (IHD5)*

Islamic history graduate students received systematic training to develop their library skills that was integrated into course modules (Section 7.3.5.1) to teach them how to physically locate the information they need in the library:

*'We studied a module that taught us how to use the library and how to use the card catalogue ... I always used the card catalogue; new technology is not my preferred way to search for information... (IHD9)*

In addition, being able to communicate with the library staff (Section 7.3.4.2) and build good relationships with them, particularly the archival staff, to seek their help in locating archival materials improved their library skills throughout the research process.

It can be debated here whether the broad use of the library in this field might be attributed to the information literacy education received by Islamic history students, the culture of the discipline or other factors. Therefore, in the conclusion the researcher will suggest further research to investigate to what extent integrating library skills training into modules can add value to the use of the library by Islamic history students when conducting their research.

## **7.5 The social organisation of the Islamic history field and information use and behaviour**

This section discusses the cultural characteristics of the Islamic history field based on Whitley's two concepts of 'mutual dependence' and 'task uncertainty'. The cultural identity of this field and its relationship with the information use and behaviour of the graduate students is discussed in Sections 7.5.1 and 7.5.2.

### **7.5.1 Cultural identity of the field**

Islamic history is a discipline that is divided into sub-topics based on specific Islamic periods. Regardless of specialities, history graduate students see the meaning of their research work in communicating with experts in the field to enhance their understanding of culture and society in the past. For example, graduate students in this field have to personally contact experts to

communicate knowledge when they need to make a decision about what sub-topic to select. One student stated:

*'I consulted a number of well-known scholars who provided me with the required advice...'* (IHD3)

Another student stated:

*'I contacted many experts in the field who studied important documents; I met them and asked them questions ... I attended a conference for Arab authors of Islamic Studies and sought many of their opinions and advice.'* (IHD10)

This provides the researcher with an indication that uncertainty about the topic in this field is relatively high. The consequence of high uncertainty about the significance of research problems is a lack of clear formulation of the research strategy based on common goals. Therefore, a non-linear research process was identified, encompasses the exploration of the research topic, searching of the literature and translation of documents. For example, graduate students in this field have to explore their topic by searching the literature thoroughly before making the final decision about the selected sub-topic:

*'I spent six months between experts and the library until I was able to define five candidate topics, which were new and had not been studied before...'* (IHD4)

In addition, they sometimes have to translate the information when it is not available in their native language:

*'Most of the information resources on my topic are available in Persian but not in Arabic... then send them [the books] to professional translators who translated their content into Arabic.'* (IHD2)

Given the spoken language (ordinary language) is part of the cultural identity of the discipline, the research outcomes become accessible to the educated public rather than specialist colleagues, and this encourages diffuse contribution to knowledge that opens to different interpretations. Some participants in this field reported that they have to access and use resources from neighbouring disciplines, such as Arabic literature or geography to fulfil their topic-specific needs:

*'Information related to social life can be found in the Arabic literature; in poems or tales ... I searched for information in the Arabic literature, such as poems, novels and also biographies'. (IHD8)*

This means that students in this field deal with fairly broad topics that can be tackled in a diffuse manner. The research problems differ in their perceived importance and also the way they are formulated and understood. Therefore, the students need to search for information to verify their results even after they analyse the data:

*'I noticed a plurality in the clothes that were worn by women at that time. Each researcher has stated specific clothing worn by women in that era. This means that women's clothing was of interest during that era. Therefore, I needed to prove my opinion by travelling to Egypt and visiting some museums that deal with the monuments of that era and taking photographs of the type of clothing worn, to support my opinion, after performing the analysis'. (IHD5)*

This reflects the fact that research results in this field are relatively unpredictable and subject to different interpretations, as it is not always easy to assess the meaning of particular results. As the research results, objects and techniques are not well standardised, this leads to heavy reliance on personal control of research work that can be achieved by personal contact and knowledge to make sense of the results.

Using Whitley's concepts, the Islamic history field is characterised by a relatively high degree of both 'technical uncertainty' and 'strategic uncertainty' (see Chapter 2, Section 2.6.2.1). Whitley (2000) argues that a high degree of 'technical uncertainty' usually leads to a high degree of 'strategic uncertainty', but the opposite is not necessarily true. This may be accompanied by a low degree of 'mutual dependence' (both strategic and functional). Consequently, this field is characterised as having a low degree of 'mutual dependence' and a high degree of 'task uncertainty'. The social organisation of this domain is characterised as having loosely structured elements that make the research culture loosely co-ordinated within the specific field and across the discipline (Whitley, 2000). This leads to a decrease in the level of co-ordination and control over research work within the field that reduces the ability of the discipline to develop technical standards for communication via digital resources. Consequently, this field is characterised as having decentralised control over the research process and resources.

## **7.5.2 Disciplinary shaping of information use and behaviour**

In this field, decentralised control over accessing resources can be observed, and this shaped the information use and information behaviour of the graduate students. The high degree of ‘task uncertainty’ shaped the students reliance on their personal control to carry out their research which can be achieved by personal contact and knowledge to make sense of their results; therefore, they are heavily reliant on their informal network of people (experts in their field) for the choice of theory and literature. According to the wide ranging topic areas in this field, students seek information resources from a wide variety of sources. As such, the library plays central role as information source to fulfil their information need, while museums and archival institutions have also been important for them as information source. Also, they access and use information resources from neighbouring disciplines in diffuse manner to fulfil their information needs. The high ambiguity of research results needs more justification and interpretation; therefore, research graduate students in this field communicate their research work through books (Whitley, 2000), while, the low degree of ‘mutual dependence’ shaped the students preference to access and use print materials more than electronic ones. Their use of the web for research purposes is restricted to speeding up the research process. However, indexing and abstracting services were used to identify relevant literature. They showed little preference for finding journal articles on the web, as trust was an important aspect of the pattern of using information that influenced their level of IT use. Therefore, their use of e-resources on the web restricted to their comprehensiveness and authenticity. As Arabic is the spoken language in Islamic History field and part of its cultural identity (mutual dependence and task uncertainty), this may shape the students need to translate other foreign languages resources to meet their information needs, and their reluctant to use foreign languages database.

## **7.6 Key characteristics of the Islamic history field**

According to the analysis of the cultural characteristics of this discipline and based on Whitley’s theory’s two key concepts, this field can be characterised as having a low degree of ‘mutual dependence’ and a high degree of ‘task uncertainty’ which shape the information use and information behaviour of the graduate students. These characteristics will be presented in Sections 7.6.1, 7.6.2, 7.6.3 and 7.6.4.

### **7.6.1 Characteristics related to the culture of the discipline**

Based on the culture of this discipline, several characteristics can be observed that shaped the information use and behaviour of the graduate students:



- Decentralised control over resources in this field made the students prefer to access and use information from a wide variety of sources.
- The high degree of ‘task uncertainty’ shaped the students’ reliance on individual control to carry out research work and their preference to communicate personally with experts in their field to gain knowledge.
- The low degree of ‘mutual dependence’ shaped the students’ preference to access and use print resources more than electronic ones.
- Books are the main communication channel for information in this field.
- Given that spoken language (Arabic) is part of the cultural identity of this field, it increases students’ demands for translation services to access and use historical books available in foreign languages.
- Indexing and abstracting services are mostly used in this field to identify relevant literature.
- The historical nature of this field controls the types of resources used by graduate students, such as manuscripts and reference works.
- The research culture of this field, which is based on searching for information from the past, makes the students dependent on the library and archival institutes as main sources of information to carry out their research.
- The dominant use of the Arabic language in this field can make students reluctant to access and use the library’s foreign language databases.
- Integrating library skills training into modules shapes the students’ preference to physically access the library.

### **7.6.2 Characteristics related to the role of the supervisor**

Some characteristics related to the educational role of the supervisor in this field that shaped the information use and behaviour of the graduate students are as follows.

- The educational role played by the supervisor as a source of guidance and consultation rather than an information provider encourages the students to be independent in searching for information related to their research topic.
- The supervisor’s recommendation to access and use the library physical collection to carry out their research and not favour to use IT tools shaped the students’ preference to use print resources.

### 7.6.3 Characteristics related to the Arts Library

Additional issues related to the library resources and services that affect the information use and behaviour of the graduate students include:

- The availability of historical Arabic resources mostly in print format encourages the students to physically interact with the library.
- The ability of library staff to provide help when needed leads the students to develop a positive attitude towards the library.
- The inability of the library to publicise its services to the students effectively makes the students depend on their own training and on their supervisor's support.

### 7.6.4 Characteristics related to Islamic history students

Not only did cultural characteristics have a great impact on the information use and behaviour of the graduate students but also the students' characteristics had an impact on their information use and behaviour:

- The decentralised control over resources in this field encourages the students to use other libraries, such as public libraries and international libraries, as external sources.
- The students' positive attitude to building their own personal collections from the very beginning negatively affects their use of the library.
- Travelling abroad to track historical information in addition to building their personal collections negatively affects students' use of the library.
- The students' preferred method of locating information resources is browsing the shelves and tracking references, which reduces their use of online finding aids provided by the library.
- The students' IT tool needs influences their interaction with the library and increases throughout the research process.
- The ability of the students to communicate with the library staff helps in building a positive attitude about the library.
- Cultural issues, such as adequate finances, encourage the students to buy the resources they need, which negatively affects their use of the library. The diagram below (Figure 7.1) illustrates the main characteristics of the Islamic history field, as suggested by the interviews that have been summarised in this chapter.

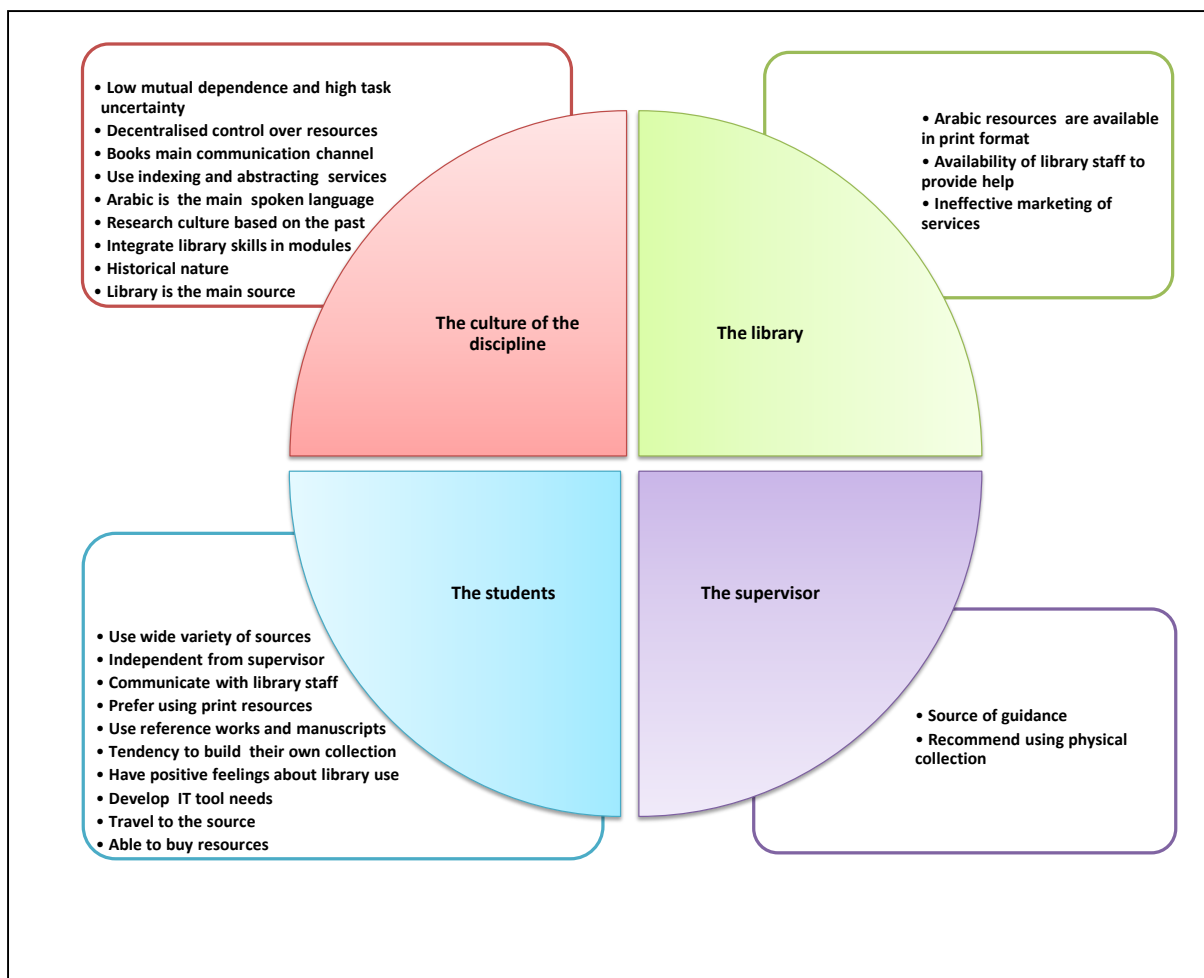


Figure 7-1 Key characteristics of the Islamic history field at Kuwait University

## 7.7 Overall summary

According to the findings of this case study, the nature of the discipline, information needs, study mode, students' personal experiences, library information services, external sources and financial adequacy are the key factors that affect the information use and behaviour of graduate students. These are in addition to the research stages, which appeared to be an interacting factor that influences the use of the library by the graduate students. The historical nature of the Islamic history field determined the types of information resources to be used and increased the demand for archival materials, such as manuscripts. The research culture of this field, which is based on searching for information from the past, made the students dependent on the university libraries as main sources of information. The availability of historical Arabic resources mostly in print format encouraged the students to physically interact with the library resources and services. A positive attitude towards using online library services, such as IT

tools, was recognised; this attitude influenced the students' interaction with the library resources and services and developed throughout the research stages.

The students in this discipline were active users of the library and spent a long time working on textual materials. However, the limited availability of part-time students on campus during the daytime made them benefit less from the online library services, such as the online database, that cannot be accessed from home. The provision of translation services by the library is essential to enable the students to access and use foreign language historical books related to their research topic. The regular communication of the students with the library staff was also recognised. The lack of effective marketing of online library services negatively affected the role of the library, while training sessions about how to use the library integrated into course modules positively affected the physical use of the library.

The overall image reflected by the participants of the university libraries in this case study tended to be a mixed one. The university library made efforts to support the students through the provision of primary and secondary sources to enable them to explore their research topics. However, the library's role appeared to be reduced, as the students built their research on a stage-by-stage basis due to the insufficiency of its book collection. The students tended to use other available external sources or to travel outside the country to fulfil their needs. In addition, they tended to buy their own resources because they had the financial ability to do so and because they wished to build their own personal collections.

The cultural context of this field was identified as an important factor that influences the information use and behaviour of the graduate students. Where there is a low degree of 'mutual dependence' and a high degree of 'task uncertainty', seeking information resources from a wide variety of sources plays a central role in shaping the information use and behaviour of Islamic history graduate students. The students in this field are highly dependent on themselves to carry out their research and are thus able to conduct independent searches for information. The role of the supervisor in this field is limited to providing the students with guidance and not to act as an information supplier. The inability of this field to develop technical standards for communicating information via digital resources shaped the students' preference to access and use print resources more than electronic ones.

Given the small sample size, many of the emerged observations would need support from other fields or more data to formulate hypotheses to be tested in further research in order to explain the relationship between the library's supporting role and the factors identified. These

hypotheses can act as a research contribution to facilitate our understanding of the complex set of interacting factors that influence the pattern of library use and the travelling behaviour of the students to acquire information. This is the most important characteristic of this field.

Ultimately, improving the library's role in supporting Islamic history students' research processes probably depends on the library's ability to promote its services effectively, develop its book collection, improve the current digital systems, address other weaknesses and focus on what the cultural context of the Islamic history field requires to satisfy the information need of the students.

## CHAPTER 8 – LAW DISCIPLINE / THE PUBLIC LAW FIELD

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### 8.1 Introduction

This chapter presents the findings of 12 interviews conducted with public law graduate students at KU regarding their perceptions about the use of the library and information resources during their research activity. The data collected from the interviews were transcribed and translated from Arabic into English. Once the transcription and translation process was complete, the coding procedure started, as described in Chapter 3 (Section 3.11.2.2). The findings from the analysed data are presented using direct quotations from the participants' responses.

This chapter proceeds as follows. The first section presents the characteristics of the Law College interviewees (Section 8.2), followed by a discussion of the cultural characteristics of the discipline during each stage of the research (Section 8.3). Next, each cultural aspect is discussed separately in the following sub-sections: the nature of the discipline (Section 8.3.1), information needs (Section 8.3.2), study mode (Section 8.3.3), students' personal experiences (Section 8.3.4), library information services (Section 8.3.5), external information sources (Section 8.3.6) and financial adequacy (Section 8.3.7). The emergent issues related to the public law discipline (Section 8.4) are then presented, followed by the disciplinary shaping of the information use and behaviour of graduate students (Section 8.5) and a discussion of the key characteristics of the discipline (Section 8.6). The chapter concludes with a summary of the students' overall perceptions of the college library's role (Section 8.7) in supporting their research.

### 8.2 Characteristics of interviewee sample

The participants were students from the Department of Public Law at KU (College of Law). Law students have to present the research they have undertaken during this programme in the form of a thesis. Only female students from this department were willing to be interviewed for the case study (nine part-time and three full-time students; see Table 8.1).

**Table 8-1 Number of participants and their characteristics**

Participants' characteristics	Females	Males	Overall total participants
Part-time	9	0	9
Full-time	3	0	3
Total	12	0	12

For the purpose of analysis, the candidates were selected intentionally from three different groups in terms of the stages of their research: the first group incorporated students who had completed their proposal and were ready to start their research; the second group incorporated students who had already embarked on their research and were in the process of writing up their thesis and the third group incorporated students who had already submitted their thesis.

Consequently, the findings of this case study were divided into three main stages:

- Stage 1: The proposal development stage;
- Stage 2: The mid-stage (collecting and analysing data, presenting the results and writing up);
- Stage 3: Students' reflections on their experiences during their research process.

Therefore, an equal number of participants were selected to represent the stages:

- Four students in the proposal development stage;
- Four students in the data collection, data analysis and writing up stage;
- Four students in the reflections on experiences stage, which involved students who had submitted their thesis successfully.

### **8.3 Analysis of cultural characteristics of the discipline of law at each stage of research**

The intention in including this section is to illustrate the cultural identity of the law discipline within a specialism (public law) and how this shaped the participants' use of the library. The aim of this study is to investigate the role of the library and how it has been influenced by the research process and which factors influence the effectiveness of its role. The cultural identity factors identified in Chapter 3 (Section 3.11.2.3) are highlighted, based on the social and

intellectual interactions of the law graduate students with the library resources and services throughout their research activities. In this section, the researcher presents the cultural characteristics of the discipline in each research stage, supported by evidence from the collected data.

### **8.3.1 The nature of the discipline**

This section discusses two elements that are part of the nature of the discipline, topic selection and the nature of the topic (which includes professional nature). The relationship between these elements and the use of the library and its information resources throughout the research process is discussed in Sections 8.3.1.1 and 8.3.1.2.

#### **8.3.1.1 Topic selection**

To graduate with Master's degrees, public law students are expected to present their research successfully in the form of a thesis. The students in this programme are required to complete theory-based modules to be eligible to commence work on their thesis. All students have to choose research topic that their supervisors approve. Each student must write a proposal that includes a brief background of the topic, the research plan and the references relating to the topic and submit it to the CGS Committee for approval. This element of cultural identity is discussed as it relates to each stage of the students' research, as follows.

#### **Stage 1: Proposal development stage**

The examined data show that public law students selected whatever topics they wished. They tended to base their selections on the professional background knowledge they gained during the Master's programme, in which they completed in-depth studies of various branches of the legal domain in different modules to fulfil the academic requirements of the programme in their first years. To register for the thesis, each student is required to select a topic and develop a proposal as a prerequisite for passing one of the Master's programme modules. Consequently, the students' choices in this case are based on the consideration of the following issues:

- ***Case study-based selection:*** One part-time student in this stage adopted this perspective, as she based her selection on her previous study of a recent issue that emerged in her workplace as a legal case. This student chose her topic because she was



familiar with it and was confident that there were information sources available related to the case. She stated:

*'In the National Assembly (Kuwaiti Parliament) where I worked, there was a trade union which had many problems with its administration, and at that time the legal administration assigned me to conduct a study of the problematic issues that arose in the trade union, as a legal representative, and to investigate the causes of the problems ... After I finished the study, I felt interested in this topic because it was a recent subject and different, and no research has been done on it. When I suggested this topic to my supervisor as a subject for my dissertation, he approved it immediately, and was interested in it. He told me that this topic had not been researched before in the field of public law'. (PLD1)*

The student in this case chose her topic based on her interest in one of the law cases she had investigated in her job. Originality was a concern for the law students when they wished to define their topics, and the supervisor's agreement was required once the students chose their topics.

The same issues recorded in stage 1 (the proposal development stage) also emerged when the students were interviewed about their experiences throughout the various research stages.

Some students might have select topics based on new issue that had emerged in their workplaces and which they felt they needed to research further, as they were practising those principles of law through their profession and becoming familiar with them. One student commented.

*'I was a member of a committee that selected employees to be hired by the government. The law, which was the committee followed, was not well-established, and as we intended to add some conditions to make sense of the application, we were unable to get anywhere because the details of the law were not very clear. So I decided to study the law to see how we might improve it. I started my reading with the judicial control laws about administration jobs to understand the root of the subject, and then I tended to focus on governmental vacancies'. (PLD12)*

- **Supervisor-based selection:** One part-time student at this stage confirmed that she counted on her professor to make the decision on her behalf. Most commonly, the

supervisor suggests more than one topic, and the student chooses the one that most interests him or her based on his/her initial background reading. In this case, the student based her choice on a discussion of suggested topics with her supervisor. She commented:

*'The supervisor suggested many topics and asked me to read about them; he asked me to select the one I preferred ... For example, one of his recommendations was to study 'corruption law' ... He suggested another topic to study might be 'capital market law', but I refused ... I selected 'competition protection in Kuwaiti law' ... After I read about it, I liked the idea of it. I did not have any idea before about this topic, and I wanted to learn more about it ... We discussed the current political situation in Kuwait, which had a great influence on selecting the topic because it can be seen as a new topic to be studied'. (PLD2)*

The student needed to undertake initial background reading before she made her final decision about the topic. Although her supervisor suggested the topic, searching for information resources about it was her responsibility. In this case, the supervisor did not provide the student with information resources but encouraged her to do background reading instead.

- **Literature-based selection:** One part-time student at this stage indicated that she adopted this perspective and selected a topic that interested her based on a scan of the literature to satisfy the requirements of the research methods module. She confirmed that she chose her topic after intensively searching the literature and reading about it.

*'I selected the topic by myself, and this is how it should be ... In the research methods course, we were asked to complete a proposal about the topic we were planning to undertake ... This gave us time to think and search for information resources and read about the topic ... I selected the topic for my Master's dissertation. I was able to limit my search to seven topics ... and after that I started to search for which topics had been studied before and which were original ... I selected a topic I was interested in and justified my selection to my supervisor, who agreed and showed interest in the topic'. (PLD3)*

The student needed to justify her choice of topic to her supervisor to obtain his agreement. In this case, her supervisor did not suggest a topic; the student made her own decision after searching the literature.

- **Consultation-based selection:** One of the students who adopted this perspective chose her topic based on a hotly debated issue raised in the newspapers and media that related to her subject area. She made her final decision after she discussed many issues related to the same topic with her colleagues. She stated:

*‘Since the establishment of the Kuwait Constitution, many attempts have been made to change the way that the law is presented in the Constitution ... As we studied the issue and many tutors have raised it and the same media and newspapers have raised the same issue about the law... I knew that the same law in Egypt had been reformulated ... I discussed the Master’s topics with my colleagues in my department, and we discussed all of the possibilities. One suggested topic was this one. We examined the availability of information resources on the topic and checked if the law had been studied in the Egyptian context. The first thing I did after I selected the topic ... was to consult the Head of the Public Law Department to ask him his opinion. He assured me that the topic was perfect, and he encouraged me to study it ... As soon as I selected the topic, I discussed it with my supervisor, who encouraged me to go ahead with my research’.* (PLD4)

Based on a group discussion, the student made her final decision about her topic after checking with her colleagues regarding the availability of information resources relating to it. In this case, the student depended on consultation with her colleagues to make her decision.

Concerning consulting a professional in the field, one student in the final stage described her experience as follows:

*‘I selected my topic based on a conversation between me and a member of the department’s academic staff ... by the way, he was not my supervisor ... but I did not perform the required reading before selecting the topic’.* (PLD9)

The above experiences in stages 2 and 3, revealed several facts related to topic selection:

1. Both the student and the supervisor suggested a set of topics, and, after a thorough discussion, the student made her own choice.
2. The supervisor did not supply the student with information resources; the student had to search for sources relating to the selected topic herself and undertake background reading.

3. The student depended on herself and not on her supervisor to find the information resources relating to the topic that interested her before undertaking the background reading.
4. The student selected a topic to meet her needs based on a literature search conducted through her interaction with the library.
5. The student selected the topic based on consultation with professionals in the field, such as faculty members, without interacting with the library.
6. The student selected a topic without needing to interact with the library because her supervisor met her information needs.

In summary, four different methods of topic selection were identified. Students in the public law field can select their topics based on their interactions with the topics during case investigations; their supervisor's recommendations; their own backgrounds (built through reading and searching the literature) or advice from their colleagues and other professionals.

### **Stage 2: Mid-stage (data collection, data analysis and writing up)**

Although the researcher did not intend to ask the interviewees about their topic-selection process as they had made the decisions about their topic in the first stage, one issue related to supervisor contribution to topic selection emerged throughout the conversations between the researcher and the two students at this stage. One student commented:

*'I selected my topic in light of the widespread discussion about the state of Kuwait regarding electoral appeals. This topic was being argued about everywhere—on the street, in the news, basically everywhere—so I decided to tackle this topic. Of course, I met my supervisor a few times to obtain instructions from him about how to start my research topic and what I needed to do next. My supervisor suggested a few topics, and I in turn suggested a few others, and then decided to go with the appeals because they received special attention from the public and the political arenas'. (PLD7)*

Although the students in this discipline can select whichever topic they wish after a thorough discussion with their supervisors, one student confirmed that she did not select the topic herself; rather, her supervisor suggested to her:

*'The topic I am studying... was his [her supervisor's] suggestion; he meant to carry out a study on it but he handed it to me. He also searched for information resources and sent them to me via email'. (PLD8)*

In this case, the student selected a topic without any need to interact with the library because her supervisor supplied her with the information resources to build her background knowledge about the topic.

### Stage 3: Reflections on students' experiences

Based on the students' experience, a set of issues that influence topic selection and shape the demand for library resources and services, in turn influencing the library's role, can be identified. These issues are as follows:

- When the students become familiar with topics, they gather information about the topics from previous studies conducted as requirements of their programme; therefore, they use library services and information resources less. One student stated:

*'The study that I did about trade unions through my job provided me with the ministerial decisions that I needed for this research. The legal administrator provided me with the ministerial decisions and international treaties and I am very thankful to him for doing that for me'. (PLD1)*

- When supervisors encourage their students to search for the information resources required to make their topic selections, they use library services and information resources more. One student commented:

*'He [my supervisor] asked me to visit the library to search for books related to the suggested topics and then review them to examine the current issues or to check for possible problems to investigate. I finished my reading, and then, based on my reading, I selected the topic.' (PLD2)*

- When the students select their topics more independently by searching the literature, they use library services and information resources more. One student stated:

*'When I wished to select my topic, the first source I thought of was the library. Most of the information resources were books. I found only one ten-page article in the Journal of Law (a Faculty of Law periodical) related only to one topic ... I browsed and reviewed the books one by one, page by page, to check if they contained any information relevant to my topic ... I spent many hours in the library'. (PLD3)*

- When students use their colleagues or professionals in the same field as sources of information about the hottest topics in the newspapers and media relating to their

subject area, they use library services and information resources less. One student stated:

*'Since the very beginning, I sensed that the Law Library would be unable to provide me with the required information resources, so I immediately had to consider other possibilities... As soon as I decided on my topic, after a long conversation with my colleagues, I started to seek academics' opinions about its credibility. Of course, I sought the Head of Department's advice and my supervisor's opinion, followed by the opinions of other academic staff'. (PLD4)*

To sum up, regarding topic selection, the students needed to have background knowledge about the topics in order to decide which ones to choose. The background knowledge that the students acquired about their selected topics resulted from their investigating the topics through their jobs, extensively discussing recent issues raised in the media with colleagues in the same field or consulting professionals in their subject areas, such as other faculty members. In this case, the students were required to justify their choices to their supervisors and obtain their agreement. If both the supervisor and the student suggested the topic, a comprehensive conversation took place before making the final decision. In this case, the supervisor encouraged the student to search the literature for relevant information. If the supervisor did not suggest the topic, the student had to search for the required information resources to meet the topic selection requirements. Alternatively, if the supervisor rather than the student suggested the topic, the supervisor might have supplied information resources relating to the topic in order for the student to undertake background reading.

Regarding the findings about the topic selection element, it can be stated that there were various aspects to the topic selection element. In this case, each student provided different perspectives relating to the way in which she chose her research topic. Each of the four interviewees involved in the first stage used a different method to select their topic; there was, therefore, no dominant method in selecting research topics in this case study.

### **8.3.1.2 The nature of the topic**

The public law discipline has unique characteristics. The students in this discipline value a professional background and practical experience in the field. The relationship between the students and the library was influenced by the credit the students gave to the professionals in the field and to practical experience. The nature of the topic is influenced by the professional

nature of the discipline, which in turn influences the type of information sources to be used. These two issues are discussed as they relate to the research stages, as follows.

### Stage 1: Proposal development stage

Law students in general and public law students in particular are expected to identify a topic for their dissertation and develop a proposal as a requirement to pass one of their Master's programme modules. In this case, they needed to choose a fresh, current topic in response to a current problem as a specific law case. The examined data shows that the professional nature of the topic influenced the use of the library by the graduate students. This issue is discussed below.

- **Professional nature:** The selected topic should be relevant to a specific law case. The studied law should be examined in a non-Kuwaiti context to seek evidence from similar cases, preferably in an Arabic context. In this case, the students need to collect information from both primary and secondary sources. This demand influences or shapes the role of the library. In this stage, all the students confirmed that they were required to choose an original topic. One student commented:

*'I did not study this topic before, and I felt it would be new to me and therefore I decided to study it. On the Master's degree, they expect us to come up with some originality and I felt that this topic would allow me to achieve this'. (PLD2)*

In order to do this, the students had to search for information from both primary and secondary sources. Following is a brief conversation between the researcher and one of the students:

*Researcher: Which information resources did you search for to complete your proposal?*

*Interviewee: I searched in books and the Journal of Law.*

*Researcher: Where did you search for them?*

*Interviewee: I searched in the Law Library ... say I need 15 resources to complete the proposal, say 10 should be books and the rest should be the main resources ... There are books which discuss the main topic in my case and such books can be placed under Constitutional Law but such books would not be very useful because, with my specific focus, I could not find more than one page so I had to extend my search to cover many specialised books that had more specific information relevant to my topic'. (PLD3)*

From the evidence above, it seems that the need for theoretical information in addition to the professional nature of the topic increases the demand for using the library, as the students need to read the main and secondary sources to obtain background information about the selected topic. The students in this stage have to use the library to meet their needs.

- **Information sources and resources used:** Students tend to seek information sources and resources that are readily available and that meet their information needs. The data of this case study shows that all the students tended to use the following sources.

**1. The College library:** The college library was identified in the data as the first choice location to search for information for all the interviewees at this stage in order to undertake background reading about their topics and develop their research proposals. Following is a short conversation between the researcher and one of the interviewees:

*'I started by suggesting the research questions, then identified my information resources' locations.*

*Researcher: What was your first location?*

*Interviewee: The Law Library.*

*Researcher: And what did you do next?*

*Interviewee: I searched for the main information sources and then searched for specialised books on my topic plus I searched in the Journal of Law and for publications published by the 'Council of Scientific Publishing' and I was able to collect many articles written by academics and experts, published in the Journal of Law'. (PLD4)*

From the student statement above, two types of information sources provided by the library needed to be used, primary and secondary sources. All the students confirmed that they used both types to complete their proposals during this stage. Based on the examined data of this case study, public law students tended to use the following sources.

**a. Primary sources:** These are the authoritative law publications produced by parliament and the courts. The parliament through its authority makes the legislation, and the courts decide on the legal issues (legislation and decisions).



**Legislation and decisions:** Due to the professional nature of the discipline, the students need to use these types of primary sources. All the students at this stage confirmed that they used legislation and decisions to complete their proposals. One student commented:

*'I used the 'law information network for Gulf Corporation Council' (Kuwait Ministry of Justice website). This provides the service for free and I can review all of the legislation and laws in Kuwait for free via this network.'* (PLD2).

Although the library provides this type of primary source locally through the Kuwait Lawyers database, none of the students at this stage indicated that they used this database to acquire the primary sources they needed. When one student was asked if she used this database for the same purpose, she responded: *'No I did not, I am not sure if I can access it without needing a password and username'*. (PLD3)

**b. Secondary sources:** Secondary sources are used to find and explain the primary sources of law. These include reference works, such as legal dictionaries and encyclopaedias, theses and dissertations, books, scholarly journal articles and specialist commentaries. Government documents are also a major source of secondary legal information. In this case, the students tended to use the library to search for the following sources.

**Print books:** All the students in this discipline confirmed that they relied heavily on books as a basic source of information. Therefore, they used the library's book collection to search for information related to their specific research topic. One student stated:

*'My topic is related to constitutional law and the library has no more than two shelves on this topic. So I personally would prefer to go directly to the shelves and search all the books there ... I was able to find enough books to complete the proposal but they would not be enough to complete the dissertation'*. (PLD3)

**Print journal articles:** The students physically used the library to search for well-known journals in their field, such as the Journal of Law issued by the Faculty of Law at KU. This journal is available in the library only in print format. Three students at this stage (PLD2, PLD3 and PLD4) confirmed that they used journal articles to meet their research needs. One student commented:

*'[...] once I found an article in the Law Journal. I found the journal in the Law library ... the academic staff directed us towards these journals. Sometimes, the articles published in these journals were better than books; I mean in terms of up-to-date information'. (PLD2)*

**Theses and dissertation:** In this stage, the students have to browse the library's thesis collection to check that their selected topic has not been studied before in the Kuwaiti context. Three students (PLD2, PLD3 and PLD4) confirmed that they used the library thesis collection for this purpose. One student stated:

*'I also searched the library for information on previous theses and dissertations to check if someone has carried out similar research or research related to my topic'. (PLD3)*

The nature of the research in this discipline is theoretical but requires professional information from those working in the field. Therefore, the students need to use the following.

**Specialists' commentary:** This service was unavailable in the library, but one of the students used it to complete her proposal as a secondary source of information. She stated:

*'I started to search for other resources, such as assertions by legal advisors, which my supervisor persuaded us to use as a source of information. What was helpful in using the legal advisor assertion is working at the National Assembly. There are many legal advisors who have expertise in the field of law. They do not just provide me with the assertion, but also with the decisions and also their comments on the decisions'. (PLD1)*

**2. The Supervisor:** For most public law students in this case study, the use of the supervisor as an information source was the second choice, after searching the library. According to one student, her supervisor provided support after she had searched the library and they had agreed on the topic together.

*'Interviewee: My supervisor supplied me with a set of foreign books.*

*Researcher: A recommended list, you mean?'*

*Interviewee: No, books, as he had a good personal collection of foreign books and because he was able to access professional websites that I could not access'. (PLD4)*

Another student stated:

*'My supervisor advised me to use Google to search for relevant information and he also supplied me with website addresses which enabled me to find many information resources'. (PLD2)*

**3. Professional libraries:** It was found that the students could gather information resources in this case study using all the possible libraries they could access. Most of the interviewees (PLD1, PLD3 and PLD4) confirmed that they used other libraries to find information relating to their specific topic that was not provided by their college library. As one student stated:

*'I head to the library first ... to check the available laws in my case and I need to check the judicial decisions which have been taken in similar cases to my case ... because the centre doesn't update the rules ... I went to the court, which has a wonderful library, I went there and I extracted the law related to my topic. I also went to the National Assembly Library'. (PLD3)*

Another student stated:

*'I sought many books from my workplace library. The library here is very rich - Al fatwa wal tashri' Library (The Committee of Legal Opinion and Legislation, issued by Islamic scholars) and it has very important collections. I was lucky enough to find most of those books in my workplace library'. (PLD4)*

**4. Google:** Three students (PLD1, PLD2 and PLD4) at this stage confirmed that they used Google to search for information related to their topic. One student reported:

*'After the selection, my supervisor asked me to read more about this topic. He asked me to establish my initial plan and, if I needed any help, he would be there to provide support. At this stage, I started searching the Internet using Google and I was able to access many information resources and collected a lot of information; I found many articles from Egypt and from the conference held in Kuwait by the 'Institute of Justice Studies' about my topic'. (PLD2)*

**5. Travelling:** For most of the students at this stage, travelling to the sources is one way to search for the books they need that are not available locally. Due to the nature of this discipline, the students rely heavily on books as a source of information. As the books they needed in Arabic are unavailable, even online, they have to travel to the source to get what they need. One student stated:

*'After I completed my search for information resources in Kuwait and was certain that I had covered all related books, I decided to travel to Egypt to search for more information resources ... I am now expected to complete the research plan. I travelled to Egypt and searched for information resources in the university libraries and also went to bookstores and I bought many information resources'. (PLD3)*

Another student stated:

*'I headed directly to bookstores to search for my information resources and I was unable to find what I needed so I realised that I might have to travel outside Kuwait to Egypt to seek for the required information resources, bearing in mind that I had a friend in Egypt who helped me to find a few of them'. (PLD4)*

**6. Other sources:** Different information resources were used in this stage by public law students, such as:

**The Court:** The students need to use primary resources. Therefore, they have to visit the court to obtain information it has recently issued in the form of decisions or legislation. Two students at this stage confirmed that they used the court as a source of information. One student stated:

*'We used resources from the courts, such as decisions and legislation ... usually, we depend on field visits to obtain the recent information we need in the form of decisions, legislation or laws'. (PLD1)*

Another student stated:

*'To be able to gain fresh, new judgments and judicial decisions, I need to go to court'. (PLD3)*

**Personal network:** One student at this stage confirmed that she used her social relationships with her colleagues in the same field to acquire information resources related to her topic. She stated:

*'I depended on my good relations with the trade union that belongs to the National Assembly and other government sectors. I relied heavily on this relationship to obtain information related to my research topic ... To be honest, we are in the field of law the main things we depend on to get information in the form of legislation and decisions are the social relation ... Working at the National Assembly facilitated the process of obtaining information about my research topic.'* (PLD1)

**Book exhibitions:** Two of the students at this stage confirmed that they used book exhibitions to search for books that were unavailable in the library. One student stated:

*'When I was devising my research plan, I visited one of the books galleries, and I asked about some of the books which I needed for my research topic but they told me that those books are unavailable because they had sold them and they would bring more the next day'.* (PLD1)

Another student confirmed that she used book exhibitions to find the books she needed. When she was asked where she got the books that were unavailable from the library, she said:

*'From the international books exhibition carried out in Kuwait I also found books related to my topic'.* (PLD3)

It seems that the students at this stage tended to collect their information resources from different sources, either from their college library, other libraries, their supervisor or through travelling. They also tended to purchase the books they needed that were unavailable in the library from book exhibitions and bookstores and to keep them as part of a personal collection to refer to when they needed to start their actual research.

To sum up, the students were required to select an original hot topic. To do this, they used the library as their first information source to search for primary and secondary sources. At the beginning, they spent a long time searching for various resources in the library, including books, journal articles and dissertations. Due to the nature of their discipline, the law students were heavy users of information and therefore used the library mostly to search for print books and journals. As their profession demands them to use primary sources, they tended to use the court as a source of information to obtain recent information. They needed to use specialist commentaries as a secondary source and therefore depended on their personal network of colleagues to obtain the information resources they needed that were not provided by the

library. Some students used their supervisor to supply them with unavailable information resources, while other students used other professional libraries to meet their information needs. Google was also used as an information source at this stage by a number of students. Travelling to the source was also a method used by one of the students to search for the books that were unavailable locally to meet their needs.

## **Stage 2: Mid-stage (data collection, data analysis and writing-up)**

In terms of the nature of the topic, the examined data revealed that during the second stage, this issue did not influence or shape the role of the library, as the students checked the originality of their topic and became familiar with other sources of information. This was identified by all the students interviewed for this case study.

- **Information sources and resources used:** During this stage, the students tended to gather more information related to their topic. They tended to manage and analyse the data collected as a kind of information processing to build up their thesis chapters. As the process of gathering, managing and analysing the data is cyclic, the students tended to use different types of sources, according to the demand of the analysis process. While searching for information, the scope of the topic became broader. Therefore, they needed to search for more information. As one student stated:

*'I started my work with an introductory chapter, I depended on books mainly to create that chapter, and then I found myself searching for statistical facts to build up the second chapter, in order to make sense of the statistical facts I had to review many laws and legislation ... I examined and studied the statistics published in many newspapers and journals ... I used articles published in the Journal of Law to collect information about the experts' opinions ... All such information was useful to clarify my vision during the analysis and, the more I read, the more opinions I was able to extract'. (PLD7)*

As the students identified potential information channels that could provide them with the main sources of information needed in the first stage and due to the demands of the analysis process, their use of the library declined. Students started to focus on other alternative sources that were available to meet their professional needs. As their research progressed, their demand for information resources increased. The findings of this research showed that the students tended to use the following sources.

**1. The supervisor:** All the students at this stage confirmed that they needed to discuss any ideas that emerged during the data analysis with their supervisor. As the conversation developed between the students and their supervisor, their ideas improved. To support the new idea, the supervisors supplied the students with the information resources to bolster their arguments. One student stated:

*'While I was performing the analysis, if I felt unsure about what I was doing, I would seek his help [the supervisor]. I had the habit of writing and consulting him for his opinion. If I was unconvinced about what he was saying, I would discuss it with him to reach agreement. To tell you the truth, he is very open-minded and flexible, which makes my job easier... He supplied me with the outcomes of the conference I mentioned earlier and he also provided me with the studied papers'. (PLD6)*

As the analysis progressed, the students needed to follow their supervisor's recommendations to formulate the final results. When one student encountered indistinct findings, the supervisor supported her by providing suitable information resources to clarify the point. She reported:

*'I discussed the findings with [the supervisor] part by part and sometimes he would supply me with a book or article to clarify the ambiguous parts. When I struggled, on many occasions, he pointed me in the right direction'. (PLD8)*

**2. Specialist commentaries:** The main aim in seeking a specialist commentary in this stage is to understand the creation aspect of the law and to identify the drawback of applying it to strengthen the argument. Based on their type of topic, three students (PLD5, PLD6 and PLD7) at this stage confirmed that they needed to use oral information from experts in the field to support the discussion in their theses. One student stated that:

*'The law I am studying has not been applied before in Kuwait, so I need to seek specific people's perspectives on it, say legal advisors. I need to seek their opinion to understand from their perspective how the law can be applied in Kuwait and what are the possible applications of it ... Also, I think I would communicate with experts in my field such as judges ... because they are the experts who have the knowledge and experience. I would also consult academic staff who might have relevant knowledge on the same topic'. (PLD6)*

Another student commented:

*'The nature of my topic required me to review and consult books as well as list people's opinions and experts to be able to understand the topic ... One of my friends knows a judge and he made the decision regarding one of the laws I was studying. I met him by chance at my friend's office and he explained to me how he made the decision which helped me a lot when completing the analysis. I met him for 15 minutes but those minutes enriched my dissertation from a practical and expert's perspective. He explained to me what he meant and how he made the decision which simplified and eased my understanding of the decision and the appeal'. (PLD7)*

**3. Personal Network:** In order to obtain information from different governmental bodies and legal institutions, up-to-date information issued by the courts or old information stored in archives, the students relied heavily on their relationships with colleagues in their field. Three students (PLD5, PLD6 and PLD7) at this stage confirmed that they relied heavily on their personal networks to meet their needs. One student stated:

*The legal advisors are lawyers and they have copies of the judgments issued by the courts. I got recent judgments from them and that met my needs, so I preferred to search for the judgments which I needed from the Ministry of Finance, in addition to my good relationship with the legal advisors from the Ministry of Finance, which helped me to obtain information in the form of judgments'. (PLD5)*

Another student commented:

*'I visited the newspaper editors. Of course, I had to use my personal relations to get the handbooks which are published by specific newspapers, such as Alqabas (a Kuwait daily newspaper) and also I visited a few government officials ... who helped me a lot and provided me with information and information resources, such as handbooks which were stored in the Archives ... I basically relied heavily on my personal network and connections to seek for information'. (PLD7)*

**4. Other university libraries:** The students at this stage tended to use other university libraries when their information needs were not met by their college library's book collection. Three of the students (PLD5, PLD6 and PLD8) confirmed that they used other accessible university libraries to meet their needs. One student commented:

*'I visited Jaber Al-Ahmed Central Library only once. I went to a professional librarian and asked him about the available information resources on my topic... I searched by topic; in*



*my case, it was Economic Law ... Once I find the titles; I visited the shelves to pick out the books'. (PLD6)*

To get the primary sources of information relating to their topics in the form of judgements, the students used the information centre provided by the university to meet their needs. As one student stated:

*'At the university, there was a Classification Centre for Judicial Decisions. Perhaps I didn't get from it the ministerial decisions, but I got some court judgments which helped me with analysing my data, but most of my field visits were focused on the Ministry of Finance when collecting the data'. (PLD5)*

**5. Google:** All the students in this stage confirmed that they used Internet tools, such as Google, either to search for articles or book publishers or to access official websites to search for primary sources. One student commented:

*'I was able to access a conference. I think it was held in 2010 or 2009. The conference was held in Abu Dhabi and the focus was the economic courts. I was able to access the main sessions of the conference and other papers published as main part of its activities. Of course, I searched the Internet... The articles I found provided me with different perspectives. Some supported the application of the law while others did not'. (PLD6)*

**6. Travelling:** Due to the professional nature of the discipline and to the demands of the analysis process, during this stage the students may need to attend some court sessions to observe how the law is applied in real cases. If the law was not locally applied, the students may need to travel to the country where the law is functional to meet their information needs. One student stated:

*'I am planning to visit the court in Egypt to observe how the law is applied to solve real world practical cases ... because the law is applied in Egypt and there are many cases related to it, when I go there, I will be able practically to observe how it has been applied and how the cases were discussed based on it. The law has been applied in Egypt since 2008; I need to understand the differences in terms of the context and the possible influences of this difference on the application of the law in Kuwait'. (PLD6)*

Three students at this stage (PLD6, PLD7 and PLD8) confirmed that they travelled to other countries where the resources relating to their topics were available. One student stated:

*'I travelled to London and joined the British Library. According to their system, I had to request the books first to be able to access and review them and this is what I did when I went there. Then I used the electronic catalogue provided by the British Library and extracted the books I thought would be useful, then requested them'. (PLD8)*

**7. Other resources:** Different information resources were used by public law students according to their information needs in this stage, such as:

**a. Encyclopaedias:** Due to the nature of their topics, two students in this stage confirmed that they needed to use reference works, such as encyclopaedias. They commented as follows:

*'I needed to analyse my data, some of the court judgments from the encyclopaedias which were issued by the courts, such as the Courts of Cessation and the opinions of the Fatwa wal tashrria' administration, but the source of information I relied on to get the judgments was the Ministry of Finance Library'. (PLD5)*

*'I used the encyclopaedia of the Economic courts ... but I did not find it in the Library of Law and I did not search for it in Jaber Al-Ahmed Central Library ... I bought it myself'. (PLD6)*

**b. Government documents:** These are publications produced by government departments and central government organisations. Two students at this stage (PLD5 and PLD8) confirmed that they used this type of information. One student stated:

*'I went to the Ministry of Foreign Affairs to review some documents and contracts with the employees but was unable to access any of them because I did not know anyone working inside the ministry who could help me to access it and I am working on this now'. (PLD8)*

**c. Media resources:** Depending on their type of topic, three students in this stage (PLD5, PLD6 and PLD7) confirmed that they used media resources, such as newspapers or TV programmes, to analyse their data and discuss a hot topic:

*'Once I understood the topic, I started to seek for information from different information resource channels including political programmes on TV, newspapers articles and so on. I collected much information using the note-taking method. For example, the Minister of Media called a conference, I listened to his speech, made notes, and extracted many ideas*

*and questions... so the events drove me to investigate more and more until I was able to cover all the issues I intended to cover'. (PLD7)*

From the evidence above, the students at this stage concentrated on other information sources and channels that were accessible and readily available to meet their needs in addition to their college library. Although the students mainly used their personal related research collection that they already organised during this stage, it was essential to conduct further searches to find more information that helped them support the different perspectives they collected relating to specific laws.

The students tended to use the library to complete their theses for a number of reasons:

**1. Using the library services:** During this stage, the students tended to use library services, such as the online Arabic periodical index or online library catalogue. Only one student confirmed that she used the Arabic periodical index, 'the periodical Kashaff', to search for Arabic articles to complete her thesis. She commented:

*'What facilitated my search for the issues of the Journal of Law that I required in my field were the periodicals Kashaff (Arabic periodical index). It is an index of the periodicals existing in the law library available on the Kuwait University libraries' website in the form of the research titles published in the journals of the Faculty of Law, and I relied heavily in my research on the library of the Faculty of Law to get the information resources to support the stage of writing-up my dissertation ... the articles helped me to write the introduction and this is the main type of information I needed when writing up my dissertation'. (PLD5)*

Most of the students at this stage confirmed that they used the online library catalogue to search for books. One student stated:

*'I needed some information about the population of Kuwait so I needed to find some information in books. One of them I found in the college library ... I searched for books in the electronic catalogue via the university's website'. (PLD7)*

**2. Accessing the library database:** One full-time student confirmed that she used a subject-specific database to search for foreign articles relating to her research. She is the only one who used a non-Arabic database to complete her research at this stage. This student commented:

*'I was able to access many articles via sites such as Westlaw. The library provided us with access information to this database'. (PLD8)*

Although the library provides a local, online Arabic database (Kuwait Lawyers) to provide students with the primary sources relating to their subject area, only one part-time student confirmed that she needed to use this database, commenting: *'Sometimes, I would require information from the Kuwait Lawyers database'*. (PLD7)

**3. Using the library's thesis collection:** In order to learn how to structure their thesis, two students (PLD5 and PLD7) at this stage confirmed that they needed to use the library thesis collection. One student commented:

*'I used the library to search for theses ... I followed the same structure as my previous colleague, from whom I learnt how to divide my dissertation into chapters, how to structure my work and ... exactly what I need to include in my dissertation and how I can start my introductory chapter and what each chapter should include.'* (PLD7)

In summary, the students relied heavily on other available resources more than on their college library during the mid-stage. To complete the gathering of information relating to their research topic and to perform the analysis, the students used various sources, such as the supervisor, professionals in the field, other university libraries, Internet tools, their personal network, the court and travel. In order to finalise and complete their theses, they needed to visit the library physically to use the library's thesis collection and access the library database and possibly the library online catalogue to search for books. In addition, they tended to use the online Arabic periodicals index to search for Arabic articles to finish writing up their dissertations.

### Stage 3: Reflections on students' experiences

The same factors appeared in the proposal development stage as have been mentioned by the students who were interviewed during this stage.

- **Professional nature:** The originality of the topic based on professional nature was also identified in this stage by all respondents when they complained about the dearth of library information resources relating to their specific topics. One student stated:

*'I could not find any articles in the library written on my topic; you know, this topic is very new and no one has discussed it before'*. (PLD9)

Another student stated:

*'For my topic, it is very rare to find an entire book discussing it in the library. You may find a chapter in a book or perhaps a section. My job is to search and find information related to my topic presented everywhere to build up my argument'. (PLD11)*

According to the students' experiences, the nature of the topic dictated which sources of information they used to meet their information needs. In respect of the professional nature of the topic, the library was not the students' main source of information in this case because other sources of information were available to fulfil their topic-specific information needs.

- **Information sources and resources:** As the students submit their theses, the search for information declines. According to one student's experience of this stage, the lack of library information resources relating to her topic delayed her thesis submission. She commented:

*'My dissertation submission was delayed because I had to travel to Bahrain to search for information resources. The library didn't have anything so I had to travel to check the information resources provided by the University of Bahrain'. (PLD10)*

To sum up, it can be inferred from the students' experiences above that the nature of the topic determined the type of information sources and resources used. The professional nature of the discipline affected the nature of the topics the students selected, and this affected the type of information sources used. In addition, the demands of the tasks they performed in each stage affected which information sources the students used to fulfil their needs.

Finally, in the light of the findings about the nature of the discipline, it can be stated that:

- The more original the topic, the less dependent on the library resources and services the students will be (Section 8.3.1.2, the nature of the topic, stage 1 and 3).
- The library information resources will be used less to build proposals as more sources of information, such as professional libraries, Google, the supervisor etc., are available (Section 8.3.1.2, information sources and resources, stage 1).
- The higher demand for information to complete research projects, the fewer library resources and services will be used by the students (Section 8.3.1.2, information sources and resources, stage 2).
- The fewer topic-specific information resources provided by the library, the less dependent on the library the students will be (Section 8.3.1.2, information sources and resources, stage 3).

### 8.3.2 Information needs

In this case study the information needs of the students identified in the data consisted of the need to use specific sources of information to complete their research. Information culture was the only cultural element identified that shaped the students' information needs. This element is discussed below.

#### 8.3.2.1 Information culture

Professionals in the field of law require information to understand different aspects of the law to answer research questions and to make sense of the laws developed and studied. The relationship with the library is determined by the extent of the services and resources the library provides to fulfil the students' professional information needs. In terms of this concept, the data show that the type of information the students need to respond to their research question influences their interaction with the library. As the students' research progressed, their professional needs for information developed. Following, this element is discussed as it relates to each research stage.

##### Stage 1: Proposal development stage

The students in this stage need to decide their research topics. Therefore, they have to check the availability of the relevant information resources relating to their proposed topic before making their final decision. In their research proposal, they are required to include an initial list of references relating to their topic. Therefore, they have to undertake extensive searches to justify their selection and convince the committee that their topic can be researched. At this stage, the students mainly need to search for books or journal articles. One student commented:

*'[...] before I made my decision, I had to check that sufficient information resources related to my proposed topic are available. I should browse these information resources. I am not expected to read everything but I should go through them, scan them to check to see if the internal titles are relevant to my proposed topic. Checking information resources before making the decision will allow me to know where the research terminated on this topic, what others have done; and what I am supposed to do and what contributions I am expected to add. If the topic has been studied before widely, then there is no point in studying it'. (PLD3)*

As the students needed to read about the principles of law relating to their proposed topic and set their research plan, the basic information resources they needed to develop their proposals were books. One student stated:

*'I relied heavily on books to complete my proposal, different books related to my topic'. (PLD4)*

Three of the students at this stage (PLD1, PLD3 and PLD4) confirmed that their first option when searching for information was their college library. As the students examined the library collection and did not find enough information resources to meet their needs, particularly in the form of books, they used other available alternative sources to fulfil their needs. As one student reported:

*'I found plenty of references in the National Assembly library related to my topic... In the framework of my research, I have two themes and have finished collecting information related to them. The first one is an introduction which talks about the establishment of the trade unions and I found references to this theme in the Law library while, for the second theme, I found the information related to it in the National Assembly library ... For the third theme, which is the core of my research, to date, I haven't found enough references related to it, so I will need to search for more information about it. At this stage, I have just submitted the proposal for my research and the committee has approved it'. (PLD1)*

From the evidence above, it seems that the information needs of the student at this stage were not met by the library. Its book collection was insufficient to enable the student quoted above to complete her proposal. Therefore, she turned to alternate sources to meet her needs. In other words, the less capable the library is of meeting the students' information needs, the less the students will depend on it as an information source.

## **Stage 2: Mid-stage (data collection, data analysis and writing up)**

After the students submit their proposal, the process of collecting information continues. As they have accessed other alternative sources of information from the first stage, they tend to gather their information from sources other than the library. When they started analysing the information according to the new issues that emerged from their analyses, their information needs developed. During this stage, they needed professional information that was not published or stored in the library collection. As one student commented:

*'The need for elaboration on the same issue in our field cannot be obtained from references or books. In that case, I need to ask experts who use it in their career in order to find information about my research topic ... when I met the legal advisor from Kuwait National Assembly and the Ministry of Finance in the executive department. When I listened to their opinions and experiences in the same field, some new prospects arose that may have been absent from the legislator's mind and I had no idea about them, as they were not available in books'. (PLD5)*

At this stage, the students' need for professional information becomes essential to supporting their argument when they interpret their findings. This professional information was not provided by the library. Another student stated:

*While I was working on my research, a lot of new political events happened which enriched my discussion. What I am trying to say here is that the richness of the events that occurred during my research journey benefited my research and strengthened it with new information. The practical experience and development of events in the real world was the main source that enriched my research with valuable information. I interviewed informally many members of academic staff to ask them for their opinions about the topic and the ongoing events. Their experiences and opinions also helped me a lot'. (PLD7)*

From the evidence above, it seems that the professional nature of the discipline and the professional information needs of the students at this stage determined the information sources needed. The students in this case did not need to use the library as this type of information was not provided in the library collection. The type of information needed in this stage is based on professionals' experiences in the field, which is essential to enrich the discussion of the students' theses, meaning that the more professional information the students needed, the less dependent on the library as an information source they became.

### **Stage 3: Reflections on students' experiences**

Regarding the students' own experiences, no evidence emerged during this stage relating to the influence of the information culture element on the role of the library.

To sum up, from the students' experiences throughout their research activities, it can be noted that the information culture had an influence on the students' interaction with the library's



resources and services. Throughout the research process, the students' professional information needs developed as the demands of each stage progressed.

In light of the findings for each research stage, it can be stated that:

- The less capable the library is of meeting the students' information needs, the less dependent they will be on the library as an information source (stage 1).
- The more professional the information needed by the students, the less frequently the students will use the library (stage 2).

### 8.3.3 Study mode

Public law students were registered in their Master's programme either as part-time or full-time, which is identified in the data as a variable that influences the student's interactions with library resources and services but not the research process itself. Two elements that were influenced by the study mode culture emerged, namely availability and accessibility. These two elements are discussed in Section 8.3.3.1 and Section 8.3.3.2 below.

#### 8.3.3.1 Availability

The availability of the students and the availability of the library resources and services are two issues that emerged that are related to the element of availability.

- **Availability of students:** Part-time students were less available on the university campus due to their jobs, while full-time students were available regularly on the university campus. Some of the library's services offered to students were only available from 8:00 am to 1:30 pm, such as the photocopying services. Part-time students in this case were not able to benefit from these services due to their lack of availability on campus during that time period. As one part-time student commented:

*'You know, as a researcher and Master's student, sometimes you need to go consistently every day to the library to search for information but, as a part-time student, I could not [do this] ... I suffered a lot with the Law Library because there is a strict restriction on the photocopying service. Some of the reference works cannot be borrowed. When I needed to photocopy a book, I would find the service unavailable because it was only available in the morning. As a part-time Master's student who finished work at 2 pm and sometimes at 5 pm, what could I do if I*

*couldn't photocopy the book or borrow it? On many occasions, I would use my personal i-Phone to photocopy the pages.'* (PLD7)

A short conversation between the researcher and a full-time student during the final stage confirmed that their availability on campus enabled them to use this service:

*'It was very helpful as I was able to visit the library in the morning and use it to help me keep copies of some parts of the book handy at home but the only problem with the photocopying service was that, if you requested a photocopy of a large number of pages, the request would be rejected'.* (PLD9)

It can be noticed from the above conversation that the availability of full-time students on campus during the daytime saved them time and enhanced their ability to build a good relationship with the library, while the part-time students, due to their work commitments, could not be available during the daytime on campus, which made them unable to use the library services. It is important to note that the less a student is available on campus, the less he/she uses the library resources and services. This applies to all research stages.

- **Availability of library resources and services:** The data show that lack of availability of the students on campus forced them to use alternate sources, such as the Internet and their workplace libraries, because access to the library resources was unavailable remotely from home, while they could often easily access those resources at their workplace. As most of the students' fields of study were linked to their professions, the information resources they needed were available at their workplace. When asked why she did not use the Kuwait Lawyers database, one part-time student commented as follows:

*'The same law, I was able to find it here in our workplace library and I was able to access it easily, plus many websites provided the same information quicker and easier'.* (PLD4)

Another part-time student who used her workplace library to search for primary resources relating to her stated:

*'I used the National Assembly library as this was part of my workplace. Although I knew that the references were available in Kuwait University library (Law Library), first I used the National Assembly library. As I reviewed the available legislation, which*

*is the deliberations and legislation that were approved and became law, I reviewed and counted them, then reviewed the court records and realised that I would need some court proceedings'. (PLD5)*

Another part-time student confirmed that she used the Internet available at her workplace to search for information relating to her topic, as follows:

*'I can perform the searches during breaks at work. The Internet allows me access to more information. It is quicker, easier and more accessible ... I found a lot of information on the Internet which discussed my research topic in relation to Qatar, Saudi Arabia, etc. ... I used Google search, which allowed me to access many web-pages and I found many studies published in Egypt on my topic'. (PLD2)*

The online catalogue provided by the library can be accessed remotely; therefore, part-time students can use this service to search for books when they are not able to be on campus. One part-time student reflected on his experience with the library as follows:

*'The good news is that the library provides us with electronic catalogues which allow students to review the collections of all the university libraries and knows where to find the required resources ... I used to search for my information resources, using a keyword or the title, the subject or by the topic, and I can also search in the library of each department separately.' (PLD12)*

From the discussion above, it can be inferred that the students used alternate sources because other sources of information were available at their workplace. The unavailability of the students on campus prevented them from visiting the library in the daytime to request information that enabled them to use the online library services. As they were part-time students, their lack of availability on campus prevented them from using the library's online services, such as the library databases (e.g. Kuwait Lawyers), which were unavailable remotely from home. Therefore, their interaction with the library was also influenced by availability but this time in terms of the availability of the library resources more than anything else. In other words, the more available remotely accessible information resources become, the more the library will be used.

### **8.3.3.2 Accessibility**

The findings of this case study reveal that the low availability of part-time students on campus means they benefit from the library's online services less, while full-time students could access

this service either from inside the library or remotely through the department. Many issues emerged related to how the accessibility of the library resources and services influences the role of the library. These issues are discussed below.

- a) **Access points:** Library access points for its online resources and services are provided on campus for graduate students. The Kuwait Lawyers database cannot be accessed on campus unless the students have the correct information provided by the library. A full-time student in the final stage commented as follows when asked about accessing the library database:

*'It was useful to some extent but we can access such sites from on campus ... the university provided us with a password and username so we can access it from anywhere on campus. I can access the databases also from the university's website via the department's computers'. (PLD10)*

Students could access resources from the departmental computer without needing to interact with the library physically. A lack of knowledge about the online library services provided for graduate students was reflected by one part-time student in the final stage when asked about the Kuwait Lawyers database. That student stated:

*'I used the Kuwait Lawyers database. It was useful and it had provisions and laws but I was not sure if it was provided by the university or the library.'* (PLD11)

Another part-time student in the first stages showed her lack of knowledge about the online library database services as follows:

*'Researcher: Did you use the Kuwait Lawyers database provided by the library?'*

*Interviewee: No, this is new information to me'. (PLD2)*

- b) **Library restrictions:** The library restrictions on some of its services and resources can limit the use of the library by graduate students. Some restrictions are placed on photocopying books that are not allowed to be borrowed. One full-time student in the final stage stated:

*'The copy I used was the only copy in the library and it was not available for external loan. At the same time, I was not allowed to photocopy more than 50 pages of the book'. (PLD10)*

Materials in the thesis collection also cannot be borrowed or even photocopied. The students had to use the theses inside the library. As one student complained:

*'Dissertation and PhD theses are under library restrictions; I was not allowed to borrow them externally so I had to do my work in the library. I also used the photocopying service to copy parts of the thesis, as we were not allowed to photocopy it all, so I would spend the whole day in the library'. (PLD11)*

It can be seen that as the library places greater restrictions on access to its collections, the less the graduate students will use its resources and services, and this is true for all stages of research.

- **Foreign language barrier:** In the Public Law Master's programme, the students' theses have to be approved by the GCC and should include a citation form with at least four or five foreign references. As the programme's language of instruction is Arabic and the students are native Arabic speakers, most are not skilful in other foreign languages. This may prevent them from accessing the library's foreign language book collection. One final stage student stated:

*'I do not have the language skills so I was unable to search for books in English. As you know, our main language on the Law programme is Arabic, so I do not have non-Arabic language skills ... It is very difficult for me to search for a book in a foreign language that covers my topic ... In the library, there is a librarian who helped me to search for my topic in French as she was unable to communicate in English, so she searched for French books for me and we were able to find a few.'* (PLD9)

In this case, the students needed someone who could guide their search of the English book collection so that they could use them as references in their theses. The students interviewed for this case study confirmed that the library staff were not proficient in English and so could not help them to access the English book collection. One student stated:

*'The library has no specialist who is able to direct students on how to search for such resources [forging resources] ... I could not find anyone in the library who was able to help. I know how to search for Arabic resources but not foreign information resources and, as you know, the main study language is Arabic and I do not have the English skills, especially professional English'. (PLD11)*

One student who had good English language skills and decided to complete her thesis using the foreign language collection confirmed that the library staff were not proficient enough in English to be able to show her how to search the database. She stated that:

*'They [library staff] do not have the required experience. They never access [the Westlaw database] and they do not have the necessary language skills'. (PLD8)*

In summary, the culture of the study mode influenced the use of the library by the students throughout the research process. The lack of availability of library services combined with the lack of students' availability and remotely accessible information resources off campus negatively affected the role of the library. Some issues emerged from the findings of this study that related to the accessibility of information resources via the library. These issues are library access points, library restrictions and the foreign language barrier.

In light of the findings related to all the research stages, it can be stated that:

- The less available the students, the less they will use the library services (Section 8.3.3.1, availability of students).
- The library will be used more by students as more remote access resources are available (Section 8.3.3.1, availability of library resources and services).
- The more library access points provided, the more its resources and services will be used by students (Section 8.3.3.2, access points).
- The greater the library's accessibility restrictions, the less the library resources and services will be used (Section 8.3.3.2, library restrictions).
- The less proficient the library staff in foreign languages, the less the library's foreign language collections will be used by students (Section 8.3.3.2, foreign language barrier).

#### **8.3.4 Students' personal experiences**

The students' personal experiences of research reflect each student's perception of the library services provided and their feelings regarding their use of its resources and services. The analysed data shows that three elements help in shaping the students' personal experience cultural identity. These elements are the performance of library services (Section 8.3.4.1),

personal feelings (Section 8.3.4.2) and personal attitudes (Section 8.3.4.3). These are discussed below.

#### 8.3.4.1 Performance of library services

Most of the students interviewed in this case study complained about the library's performance. One issue across all the interviewee accounts was the lack of specific information sources provided by the library in the form of books. Over half of the students complained about this. From their perspective, the library's current book collection was insufficient to meet their needs, which varied through each stage of their research. They believe that the library should provide them with more specific books in their field to support their research process. This issue will be discussed through all the students' research stages, as follows.

During the first stage, the students' needs are restricted to searching and finding information resources to create the background knowledge required. The library's collection during this stage is limited to providing the students with the available information resources. If the library does not have the necessary resources to meet the students' needs at this stage, they might use other alternative sources. One student stated:

*'I faced a problem in finding the resources which tackled my research topic in the Law Library ... When I searched for resources related to my topic, I might find some resources, but not many, but when I searched in the National Assembly Library, I found many resources which could be used as a reference for my research. I found references that discussed my research topic in detail'. (PLD1)*

During the second stage, the same issue emerged about the library's book collection. The students built their personal collections from the very beginning, and their information needs in this stage became more professional. Based on the topics they selected and what emerged from the analyses, they needed to search for books to support their arguments. One student who decided to use foreign resources to complete her thesis commented:

*'I went to the Law Library but I was unable to find any Arabic books related to my topic ... Once I completed my search of the Arabic information resources, I started searching for foreign information resources because those normally include more recent books but, unfortunately, the Law Library of Kuwait University did not pay enough attention to this issue, I think because students usually do not demand such resource ... I know the books available in the library now by heart... In International*

*Law, which is my area, we need to use real world cases to support the argument. I personally found a book on Amazon which referenced all the case ... It saved me time and eased my work'. (PLD8)*

Another student in the final stage reflected on her experience regarding the lack of information resources in the library, particularly Arabic books. She commented:

*'The library was unable to cover my needs for information resources and this is not new. I've experienced this with the library since I was a first year student. The library was unable to provide me with information resources to complete assignments, so I used to go to the publishers to buy my books'. (PLD10)*

Based on the discussion above, it seems that the library needs to develop its book collection to be able to satisfy the information needs of its students throughout all the research stages. Some students need a special type of book for a specific type of research topic. If the students do not find what they need in the library, they might not use it.

Students who had chosen different topic options in this stage reflected on their experience of using the library resources and services and suggested various future improvements that might satisfy their needs. Their suggestions were as follows:

1. Develop the library collection to enrich the students' research with information resources, especially books.

*'I think that the library should provide us with more information resources ... The library is very poor in terms of information resources compared to what you can find in the commercial libraries and in book galleries. You know, to complete the project we are expected to use over 40 references'. (PLD9)*

2. Cooperate with governmental bodies by linking their legal departments with the library.

*'I am not sure why the library does not cooperate with other governmental bodies, such as the Ministry of Finance and the Ministry of Planning, to share the resources and publications published by them to enrich the library collection ... Why is there no link to the legal departments in the ministries where we can access and review their resources... If the libraries were able to communicate with each one, and create a link to their collections, publications and resources, as well as the experts that would be very useful.' (PLD11)*



3. Recruit specialists in law who can support the students with professional information when needed.

*'Appoint a legal adviser who has experience and knowledge of law and is ready to discuss the students' needs and concerns about their legal topics. I need to have knowledge about the information resources provided by the library as well as of the topic, so they will be able to direct me towards which information resources I should use and review. The general librarians are unable to answer such questions. He should have a PhD, extensive knowledge, and be appointed only for Master's and PhD students'. (PLD11)*

4. Address other issues related to the book collection, such as providing more than one copy of a book and providing more specialised books in the field.

*'The library should be aware of specialisations in law, different focuses and different topics. The books should be updated and newly published'. (PLD12)*

*'Increase the number of copies of each book because the library has only one copy of each title'. (PLD10)*

5. Recruit a professional librarian who has knowledge on how to search non-Arabic online resources to help the students search for foreign language resources.

*'The library could appoint someone who is a specialist to instruct us on how to search English sites: that would be useful. He/she should be able to understand the professional language because, even if I was able to understand simple language, I would need someone who is professional and who understands the terminology to help me to focus my search'. (PLD12)*

6. Provide the students with training sessions on how to search for important resources in their field and how to structure their theses.

*'The library is a vital place for researchers, so it should be able to provide training sessions and conferences on how to use the library and which information resources are available, on a regular basis. They can communicate to us via email to inform us about the sessions. The library could invite a specialist who is able to advise us how to search the official law sites, how to reference our work and how to cite it and teach us how to structure our work. Such workshops and sessions must be arranged by the*

*library and I think the library needs to cooperate with the Master's students more'.  
(PLD11)*

To sum up, in light of the above facts identified across all the research stages, the library information resources seem inadequate from the students' perspective to satisfy their needs. The specific needs of their research require more specialised resources to fulfil their information needs. If the library resources and services are unable on many occasion to meets the students' needs, the students might not use its resources and services again. In other words, the fewer information resources provided by the library, the less dependent the students will be on the library as information source.

#### **8.3.4.2 Personal feelings**

The students' feelings regarding library services have been identified from the data of this research as one of the most important issues shaping the students' personal experiences. Such feelings developed throughout the research process. According to the examined data of this case study, this element affects the role of the library but does not affect the research process. Therefore, this element will be discussed as it relates to all the research stages, as follows.

The students communicate with the library from the very beginning to check the availability of the information resources related to their topic before they make their final decision. Through their interaction with the library materials, they experienced a lack of information resources, especially in terms of the Arabic book collection. Therefore, the students developed a negative image of their college library. In this case, they showed different negative feelings about the library regarding its information resources. One student in the first stage commented:

*'The Law Library is supposed to be a specialised library that supports me with the resources I need in my field, but when I searched it for information resources related to my topic, I was disappointed ... If you ask me to evaluate the Law Library, I can say that it is a poor library'. (PLD1)*

Not only had the students developed negative feelings about their college library due to the lack of information resources, but they also noted the poor organisation of the books on the shelves. One student at the first stage showed his dissatisfaction with the library's organisation as follows:

*'To tell you the truth, I was not very pleased. The library system is awful... Over 75% of the books are not on the shelf. So when someone comes to search for a book, they*

*won't find it. The books are everywhere; you ask them [the library staff] where the book is. The answer will be: we don't know. If I am desperate for a book I will search for it on the tables: will I find it?' (PLD2)*

Another student at the mid-stage who reflected on her experience with the college library felt frustrated when she checked the library resources related to her topic. She stated:

*'The Law Library made me feel down due to a lack of information resources on my topic, as most of what the library had was out-of-date. The library also lacks specialised books, so I had to search books for one or two paragraphs'. (PLD8)*

As the student developed a negative image of the library collection during the earlier stages of her research, this made her decide not to use the library resources and services again but to use other available sources to meet her needs. One student in the final stage stated:

*'As a Master's student, and as the library was unable to satisfy my needs for information resources, I had to seek for information from other information sources and libraries. I discovered that some commercial libraries had more books than the college Library of Law, which was painful'. (PLD11)*

In summary, based on the above evidence, it seems that the students developed a negative image of the library through their interaction with it from the very beginning, and this affected their use of the library. These negative feelings about library resources and services encouraged the students to use other available sources to meet their needs. In other words, the more negative the image the students develop about the library resources and services, the less dependent on the library as an information source they will be.

### **8.3.4.3 Personal attitudes**

A positive or negative attitude towards gathering the information resources needed influenced the role of the library. All the interviewees held a positive attitude about collecting broad research-related information at the beginning to be used at any stage of the research. The building of this collection started, in some cases, from the very beginning, sometimes before the students made their final decision about their topics. This element is discussed in relation to every research stage, as follows.

The examined data revealed that the public law students had positive attitudes about collecting as many information resources as possible to be used in the later stages. From their perspective,

adopting such an attitude resulted in information being easy to access. One part-time student in the first stage confirmed that she bought the Journal of Law from the publisher and kept it as part of a personal collection to use when needed. She stated:

*'I bought the issues [law journals] from the Council of Scientific Publishing ... I prefer to buy them as there are many important articles on my area which I am interested in, so I prefer to buy the issue and keep it for my personal reference. To me, it is easier and quicker to buy the issue'. (PLD4)*

Having created part of their collection in the first stage, the students continue to gather more information in the mid-stage. This attitude emerged when the students were asked about the type of information they used in the process of analysis. The following conversation took place between the researcher and one part-time student in the mid-stage:

*'Researcher: Where did you get the laws from?*

*Interviewee: From the Journal of Law and, as I was a graduate student, I collected many of them and saved them as a personal collection to use later.*

*Researcher: So you have your own personal collection?*

*Interviewee: Yes, of course' (PLD7)*

Again, when asked what sort of information she needed when writing up her dissertation, she added:

*'I had to go back to some books to understand how the appeals' decisions were made in specific cases ... some of them I borrowed from my supervisor, a few I found in the university library and some I found in the book galleries ... My personal collection became rich because I collected information from different sources and I photocopied the parts I needed with the book's cover and I saved them in my library'. (PLD7)*

From the conversation above, it seems that the same attitude towards creating a personal collection emerged in the very beginning. As the demand for information throughout the research process increased, the students' personal attitudes to building their research-related collection increased.

The same evidence was identified from the interviewees' responses in the final stage. One full-time student reflected on her experience throughout the research process:

*'Researcher: How did you search for your articles?*

*Interviewee: I went to the Council of Scientific Publishing; the staff there provided me with an index which included all the articles published in the journal.*

*Researcher: Why didn't you use the college library to find the articles?*

*Interviewee: Because I wanted to buy the issue s.... I wanted the resources to be handy and to keep the books I used to complete my dissertation. I wanted to create my own personal collection, you know? When you borrow a book from the library, you have to return it but when you buy it, it becomes your own. Sometimes, I would forget to write down the page number. In that case, what would I do if I had returned the book to the library? How am I going to get it again? It is much easier to buy the book and keep it for my personal use'. (PLD9)*

From the discussion above, it can be noticed that the students' personal attitudes to building a research-related collection were not influenced by the research process but did affect the role of the library, meaning that the more positive attitude the students have towards building their personal collection from other sources, the lower their use of the library as an information resource will be.

Ultimately, in light of the above facts identified in terms of the students' personal experiences throughout all research stages, it can be stated that:

- The fewer specific information resources provided by the library, the less dependent are the students on it as an information source (Section 8.3.4.1).
- As the students' negative image increases, their use of library services and resources decreases (Section 8.3.4.2).
- The use of the library as an information source decreases as the students develop a more positive attitude about building their personal collections (Section 8.3.4.3).

### 8.3.5 Library information services

The examined data reveals that the library information services influence the students' use of the library and information resources. Training and support are identified in the data as the most important elements that help to shape the information services provided by the library. This element is discussed across all stages of the students' research in the following sections.

#### 8.3.5.1 Training and support

In respect of this case study, students articulated a need for systematic, instructed training to learn how to use the library and the different types of information resources and services available. Despite the fact that training sessions were provided for users on request, the analysed data show that the library had not targeted public law students by offering specific sessions. Four issues related to training and support were identified in the data: promotion of services, library instruction, personal training and supervisor support. These are discussed below.

- **Promotion of services:** Advertising helps shape the library's information services. Most public law students who participated in this case study admitted that they had not attended a systematic training programme designed by the library, as most of their knowledge about it came either from their supervisor or personal efforts based on trial and error. Most of the research participants claimed that they did not receive any type of promotional message to attend a training session offered by the library. One part-time student in the mid-stage reflected on her lack of awareness of workshops offered by the library as follows:

*Researcher: Do you know that the library provides training sessions to teach students how to use the library's information resources?*

*Interviewee: No, I didn't know about them.*

*Researcher: But I personally saw the promotions posted in the main entrance of the library.*

*Interviewee: Well, the library has access to our email. Why don't we receive emails from the library to inform us? The library can use email to promote this service and any other service'. (PLD6)*

One full-time student in the mid-stage confirmed that she attended a workshop provided by the library to learn how to search Arabic databases. She stated:

*'I attended a workshop called Search Methods, I am unsure which year it was, but I remember that we sat with an information specialist to instruct us on how to use and access electronic resources and official websites in Arabic. I personally subscribed to a few of them and, anyway, searching them was not a big deal because they are easy to use. I found this useful but we needed to learn more about how to use and access foreign information resources and databases such as Westlaw'. (PLD8)*

From the discussion above, it seems that the marketing of the library service programmes is insufficient and does not reach all students. Although public law students are allowed to register as either full-time or part-time, the promotion service of the library failed to reach them. The library should arrange more effective marketing of its services so that all students can be aware of them. If the students do not know which services are available to support them in their research, they might not use them. In other words, the more advertising the library provides for its services, the more the students will use its training services.

- **Library instruction:** Library instruction reflects a set of steps that users can follow to use any service provided by the library. As the students in this discipline relied heavily on books, they tended to mainly use the library catalogue to search the book collection. The accounts provided by the interviewees reveal that the library provided printed instruction about how to use online library catalogues and about how to renew books online. In this case, what strongly shaped the training element was library instruction. Accordingly, the library appeared to have an influence on training the students how to use the library catalogue.

Both full-time and part-time students interviewed in this case admitted that they used the library catalogue. One student at the mid-stage stated:

*'Next to each computer, there is a small sheet describing the methods that a student can follow to complete the search, although the library provided a booklet including information on how to conduct a search, how to renew a book and how to use the library services'. (PLD5)*

The students thus used library instruction to become familiar with the library catalogue by practising searching for books. One student said:

*'I searched by using the subject or the title of the book as a keyword, I inserted them in the search box and sometimes I searched by classification code... I use the classification number to request books from the librarian or to find the books directly on the shelves'. (PLD5)*

One student in the proposal stage reflected on her lack of knowledge about the library catalogue. When asked about using it, she stated:

*'If I needed a book, I asked the librarian for the shelf number and then... found the book on the shelf if I could .... I had no idea what search tools are available; the librarian should have directed me ... I had no idea that the library had this service'. (PLD2)*

Therefore, the library provides instructions for students on how to use the library catalogue, but one of the students confirmed that she did not know about this service. It seems that some of the students would browse the shelves for books or ask the librarian to find them.

- **Self-Training:** The students' ability to search and use information to fulfil their needs reflects their information skills. It was noted earlier that the library did not target students for systematic training to improve their information skills, as most of their training was based on their own efforts using trial and error to find the relevant information. In this case, what notably shaped the training element was their personal effort. Therefore, in this case, the library did not appear to have any influence.

The examined data of this case study show that the students usually used articles in Arabic because their studies were focused on the Arabic context. Arabic articles are indexed in an online index called the 'periodical Kashaff'. In this case, the Arabic articles are available in the library as print copies but not in electronic format. Accordingly, the students did not need to use the library database but used the library catalogue as the Arabic articles were available in print format. However, if they needed to search for foreign articles, then they had to use the



leading database in their field, such as Westlaw. One student, whose topic required articles in English, confirmed that she used the trial and error method to search the foreign language database:

*'To tell you the truth, searching on the database itself was not an easy job. Unlike other sites, the Westlaw database is very complicated ... I used trial and error to search this database. I have learnt from my mistakes and ... my supervisor helped me, but I was unable to gain much from him because it was a matter of practice'. (PLD8)*

For primary sources, the students can use the Kuwait Lawyers database. This local database provides users with legal documents in the form of decisions and legislation. Not all the students need to use this database; this is only necessary when their topic requires this type of primary source:

*'Researcher: Do you have any clue about the Kuwait Lawyers database?'*

*Interviewee: Yes, but I do not think they would be very helpful.*

*Researcher: Why?'*

*Interviewee: It includes information about legislation irrelevant to my topic'. (PLD6)*

When asked about this database, another student showed that she was familiar with using it from the undergraduate level, as she had practised searching it and did not need any training because it was simple and easy to search.

*'Researcher: Do you know about the Kuwait Lawyers database?'*

*Interviewee: I knew about it since I was on the undergraduate course as we were able to access it from the department's computers. I was able to search for laws and legislation by using the number of the judgment or a keyword'. (PLD11)*

It can be inferred from the discussion above that the information skills of the students developed through their personal efforts by using trial and error during the research process or through their previous experience at the undergraduate level. Therefore, the library appeared to have no influence on students developing information skills. In other words, the less training support the library provides the more personal training methods the students will use.

- **Supervisor support:** The supervisor played a role in training all the students to search for information resources relating to their topic. From the very beginning and after the students selected their topic, the supervisor directed the students to where they could find the information resources or how to search for them. Supervisor support will be discussed with regard to all stages of the students' research, as follows.

In the first stage, the supervisor directs the student to where she can find relevant information resources related to her topic. As one student in the first stage commented:

*'When I chose the topic ... I went to my supervisor to seek his approval of the topic and consulted him about the availability of references related to it, and where I could find them. Then he informed me that the references related to my topic were available in Kuwait University Library (Law Library), and also in the Kuwait National Assembly Library'. (PLD1)*

In addition, the supervisor provided training support to improve the students' information skills and study skills. In terms of information skills, one student in the mid-stage, whose topic meant that she needed to use the foreign language database, stated:

*'I personally tried many time to access Westlaw. I couldn't access it! I asked my supervisor. He accessed it in front of me and he showed me how to access it and use it. To tell you the truth, he helped me a lot'. (PLD8)*

As the language of instruction of the Master's programme in law is Arabic and the students' foreign language skills, such French skills, were poor, this prevented them from accessing the foreign language collection. In this case, the supervisor provided support by taking the students on a tour of the library to show them how to search for those resources. One student in the final stage stated:

*'I asked my supervisor for help, and he came with me to the library and showed me the French resources. He had not studied abroad, but had skills in French. He helped me to find books in French and showed me that it was easier to search for a book using the classification number'. (PLD9)*

In summary, the library information services influenced the role of the library. The lack of effective marketing of the services provided, together with the training role of the supervisor,

negatively affected the role of the library. The more ambiguous the library services, the more reliant the students were on their personal effort and on their supervisor to develop their information skills.

Therefore, in light of the above findings, it can be stated that:

- The more promotion services a library provides, the more its training services will be used (Section 8.3.5.1, promotion of services).
- The more instruction the library provides, the more the library services will be used, such as the online catalogue (Section 8.3.5.1, library instruction).
- The less training support the library provides, the more personal training methods the students will use to improve their information skills (Section 8.3.5.1, student personal effort).
- The fewer training sessions a library provides, the greater the role of the supervisor as an information skills trainer (Section 8.3.5.1, supervisor support).

### **8.3.6 External information sources**

According to the analysed data, external sources can be defined as those available outside university libraries. Across all the conversations, external source cultural identity appeared to have a great influence on the library's role in supporting each student's research. In addition, the data of this case study show that the students used external sources for two reasons:

1. The lack of information resources provided by the library about their specific topic.
2. The need for professional information in response to the nature of their discipline.

Accordingly, two elements that shaped the external information source cultural identity were identified in the data-published and unpublished information sources. The two elements will be discussed as follows:

#### **8.3.6.1 Published information sources**

External sources are used according to the lack of library information resources. As the students checked the library's collection of books and articles in the first stage, they became aware that the library collection was insufficient to support them through every research stage. Therefore, they started to search for books related to their topic in other sources outside of university libraries. Across all the interviews, the insufficient range and quantity of Arabic books

appeared to have a great influence on the students' use of external sources to fulfil their information needs. In this case, the students tended to use:

**The supervisor:** For all the students, their supervisor was the second option as an information source if the library failed to meet their needs. As the professors in this discipline have a habit of collecting books and journals to update their knowledge of their subject and keep these personal collections in their offices, the students tend to seek information there to meet their needs. One student in the mid-stage commented:

*'I sought my supervisor's help, who provided me with many books that he had already in his personal collection. He helped me a lot as I struggled on many occasions to find the information resources to complete writing the analysis during the analysis stage. My supervisor has a very rich library ... The information resources I was able to find in his library I was unable to find in the university library'. (PLD7)*

**Book exhibitions and book stores:** Based on their supervisor's recommendations, the students became aware about which external sources were available to meet their needs. One of the students confirmed that her supervisor recommended that she visit books exhibitions to find what she needed:

*'My supervisor had published a few [books in Egypt] and he also informed me that Ain-Shams University Library had them. He provided me with a reading list, and advised me either to travel to Egypt to find the books or to wait for the book exhibition to buy the books ... I decided to wait'. (PLD2)*

Another student who used both Arabic and foreign books in her research also used book exhibitions and online bookstores to search for books relating to her topic. She stated:

*'I ... visited the book exhibitions and the most useful bookstores were the Jordanian publishers. I contacted a few of them and they were able to ship the books to Kuwait. One of the libraries was very useful because they listed all the books they had on the Internet and I was able to select the ones I needed.' (PLD8)*

**Travel:** Some of the Arabic books needed by the students were unavailable in their own country but were available abroad. Eight participants in this case study stated that they travelled on many occasions to other countries to search for and buy hard-to-find books. One student at the first stage said:

*'As a student, I must wait for book exhibitions to buy my books or I must find them from Egypt. I have to travel to find my books because not all of the books I need are available in the library'. (PLD3)*

As research progresses, the demand for information increases and therefore the students tend to seek their information resources wherever they are available. Another student in the mid-stage commented:

*'I ... sought my information from outside Kuwait and I travelled around to seek my information resources, so I no longer depended on the library's information resources. I expected that I would need external information resources but I did not expect that it would be to this extent'. (PLD7)*

Not only was the library's book collection insufficient to support the students' research, but so were the other resources. Therefore, the students in this case tended to use the following.

**Non-university libraries:** All the students in this case study used other specialised libraries to search for the information resources relating to their specific topic. One student at the mid-stage commented:

*'I searched in the Justice Palace Library and was able to find only one book. In the university library, I did not find any. What helped me was that I could also seek information to support my argument from a different field ... I am also planning to search for information resources in the Arabic Centre for Planning; I have been directed to it and would also like to visit the Institute of Justice Studies. Both of these centres may hold important information resources related to my topic'. (PLD6)*

**Official websites:** For two of the students in this case study, official websites available on the Internet were an easily accessible external source to fulfil their needs. When asked about using primary sources such as provisions in the library, one student reflected on her experience:

*Researcher: Did you use provisions and laws?*

*Interviewee: Yes, but the library only had a few of them, as they were stored as volumes. So I used the Salah Al-Jasim system. Salah Al-Jasim is a lawyer who created a site that includes a package of provisions and laws and is always up-to-date.*

*Researcher: How did you access it? Via the library?*

*Interviewee: No, not at all, I purchased my own subscription'. (PLD11)*

Another student in the final stage stated:

*'The department provided us with access information to Salah Al-Jasim site which provided new laws and provisions that were useful ... This site is not accessible via the library, so I had to access it via the computers provided in the department's lab. I am unsure why we can't access it from the library'. (PLD12)*

### **8.3.6.2 Unpublished information sources**

External sources are used due to the need for professional information. Due to the nature of the law discipline, the students needed information that was unavailable in books or journal articles, such as information collected by observing cases in court, interviewing government officials, provisions issued recently by the courts or government documents stored in the archive. All this information can be categorised as unpublished information. The main sources for this type of information identified in the examined data are the courts and specialist commentary. These two sources are discussed below.

***The Courts:*** The students needed to visit the courts to obtain primary sources, such as provisions that have been issued by the court recently. Six of the students in this case study confirmed that they needed to visit the court to collect information relating to their topic. One commented:

*'The focus of my dissertation was to study the laws and provisions and ... review them ... Some of the information I needed was not published so I had to go to the court to collect my information ... Such information resources are usually located in the court library, which is why I went to search for them there'. (PLD12)*

***Specialist experts in the field (Specialist commentary):*** This type of information can be obtained from expert lawyers in the field to understand different aspects of law application in response to legal cases. Half of the students interviewed in this case study confirmed that they needed to meet experts in the field to acquire this type of information. One of the students stated:

*'I would ask experts, including academic staff, legal advisors, and others, who might have enough knowledge of my topic. I would interview them officially or have an informal*

*conversation to clarify ideas and issues. So, I not only seek information from one information channel but from varied information channels. I am more aware of the experts in my field and I know how to seek their support. My information sources and resources are varied'. (PLD6)*

To sum up, based on the above identified facts, two types of external information sources were common across all research stages—published and unpublished information sources. Whilst all the students named their supervisor as the main external source from which they sought information, they added other professional libraries, book exhibitions, travel, official websites, specialist experts in the field and the courts as possible sources of information.

In order to interpret this summary, it can be stated that:

- The more available the supervisor as an information source, the less dependent the students on the library's resources and services (Section 8.3.6.1, the supervisor).
- The fewer published resources provided by the library, the more the students depend on other available sources, such as book exhibitions and travel (Section 8.3.6.1, book exhibitions, travel).
- The more professional library resources are accessible, the less use of the university library resources and services (Section 8.3.6.1, non-university libraries).
- The more Internet resources available externally, the less contribution the library makes to students' research (Section 8.3.6.1, official websites).
- The more need for unpublished information in the field, the less the library will be used by the students (Section 8.3.6.2).

### **8.3.7 Financial adequacy**

This cultural identity factor represents the students' financial capability to pay for the information resources needed for their research. Capability is the only element identified in the data that shaped the financial adequacy cultural identity. Students bought their information resources, including books and journal articles, because they had the required funds to pay for them, as the library was unable to meet their topic-specific information needs. The data reveals that no influence of this cultural identity factor was identified in the research process, but there was an effect on the students' interaction with the library. This element is discussed below.

### 8.3.7.1 Capability

The examined data show that the students tended to buy their information resources as they complained about the lack of topic-specific materials in the library. This phenomenon occurred during all stages. In other words, the students bought different types of information resources as needed when the library was unable to provide them with what they required. One student stated:

*'All the students I know were unable to complete their dissertation on time due to a lack of information resources. A student can spend a whole year searching for information resources and we need to travel here and there to find and buy them'. (PLD10)*

One interviewee in the first stage confirmed that she bought the books relating to her topic when she could not find what she needed in the library.

*'I bought many books from Egypt ... I found Al-Nahda Library (a private library) on the Internet which published many books on my topic ... via their website; I ... emailed them asking them to provide me with a list of law books published on my topic ... I asked them for the payment details as I am not an Egyptian resident ... Fortunately, I had a contact in Egypt who bought me the books.'* (PLD2)

Another participant at the mid-stage confirmed that she paid for a subscription to a well-known journal in the field to get articles in print format. She stated:

*'I subscribed personally to the journal to be able to receive the issues regularly. I also went to the Council of Scientific Publishing in Kuwait to review and bought the older one ... I subscribed for four years to the Journal of Law'. (PLD7)*

Another interviewee in the final stage confirmed that she paid to access local subject-specific databases, such as the Kuwait Lawyers database, from home to obtain the information she needed:

*'Researcher: Did you use the Kuwait Lawyers database?*

*Interviewee: Yes I used it to cover only a few issues.*

*Researcher: How did you access it?*



*Interviewee: I paid for my own subscription.*

*Researcher: Why did you buy it, since the library provided it?*

*Interviewee: Because I wanted to access it from home, as this is easier'. (PLD9)*

The lack of information resources in the form of books forced this student to buy her information resources from wherever she could find them. In addition, the limited accessibility to the library's subject-specific database led the student to pay a subscription fee to obtain what she needed from home. As the students had the required funds to pay for the information resources, they did not wait for the library to meet their needs. Therefore, financial adequacy is another factor that emerged as having an effect on the students' use of the library.

Ultimately, based on the above discussion, it can be stated that:

- The fewer library resources and services, the more the students depend on their own funds to acquire the information resources they need.

## 8.4 Emergent issues

This section presents some issues that emerged from the analysed data that can be considered research contributions for this case study, such as issues relating to the role of the library and the travelling behaviour of the graduate students. These issues are discussed in Section 8.4.1 and Section 8.4.2.

### 8.4.1 Issues related to the role of the library

Several emerged observations relating to the use of the law library beyond those in Chapter 5 (section 5.4.1), Chapter 6 (Section 6.4.1) and Chapter 7 (Section 7.4.1) are presented below.

#### **For the first stage:**

- There is a relationship between the availability of alternative sources of information, such as professional libraries, Google, the supervisor etc., and the low use of the library by the students to build up the proposal (Section 8.3.1.2, Information sources and resources);

- There is a relationship between inability of the library to meet the students' information needs and their low dependency on it as an information source (Section 8.3.2.1, Information culture).

**For the second stage:**

- There is a relationship between the increased demand for information to complete the research project and the low use of library resources and services by the graduate students (Section 8.3.1.2, Information sources and resources);
- There is a relationship between the high need for professional information by the students and the low frequency of the library use (Section 8.3.2.1, Information culture).

**For the third stage:**

- There is a relationship between the low availability of topic specific information resources provided by the library and the low dependency of the students on the library as information source (Section 8.3.1.2, Information sources and resources)

**For all the stages:**

- There is a relationship between originality of the topic and the low dependency of the students on the library as information source (Section 8.3.1.2, professional nature, stage 1 and 3).

*Availability issues*

- There is a relationship between the low amount of specific information resources provided by the library and the low dependency of the students on the library as an information source; (Section 8.3.4.1 );
- There is a relationship between the degree of instruction the library provides and the use of its services such as the online catalogue (8.3.5.1, Library instruction);
- There is a relationship between the availability of the supervisor as an information source and the low dependency of the student on the library's as information source (Section 8.3.6.1, the supervisor);
- There is a relationship between the low published resources provided by the library and the high dependency of the students on other available sources, such as book galleries and travel to meet their information needs (Section 8.3.6.1, books exhibitions, travel).

### *Accessibility issues*

- There is a relationship between the high accessibility of professional libraries and the low use of the university library resources and services (Section 8.3.6.1, Non-university libraries);
- There is a relationship between the increased need for unpublished information in the field and the low use of the resources provided by the library (Section 8.3.6.2, unpublished information source);
- There is a relationship between the low foreign languages proficiency of the library staff and the low use of library's foreign language collections (Section 8.3.3.2, foreign language barrier).

### *Training and support*

- There is a relationship between the few training sessions the library provides and the increased role of the supervisor as an information skills trainer (8.3.5.1, supervisor support).

### *Attitudes issues*

- There is a relationship between the negative image the students build about the services provided by the library and low use of its resources and services (Section 8.3.4.2);
- There is a relationship between positive attitude the student have towards building their personal collections and the low use of the library (Section 8.3.4.3).

### *Financial adequacy*

- There is a relationship between low amount of library resources and services provided and the increased dependency of the students on their own funds to acquire the information resources they needed (Section 8.3.7.1, capability).

These observations need to be compared with those of other three disciplines and the most important only will be discussed further in Chapter 9.

## **8.4.2 Students travelling behaviour**

In this section, some emergent issues related to the public law students' travelling behaviour are discussed, such as travelling to the court (Section 8.4.2.1) and travelling abroad (Section 8.4.2.2).

#### 8.4.2.1 Travelling to the court to acquire primary resources

One of the interesting travelling behaviours that emerged in this case study was related to the need of some students to visit the court to access primary materials, such as legislation and decisions. It was found that the court plays an important role as an information source for public law students to obtain the information needed to complete their research projects (Section 8.3.1.2 and Section 8.3.6.2):

*'We used resources from the courts... usually, we depend on field visits to obtain the recent information we need in the form of decisions, legislation or laws'. (PLD1)*

To carry out their research, the students need recent decisions and legislations issued by the court as unpublished information; therefore, they have to travel to access those primary materials:

*'To be able to gain fresh, new judgments and judicial decisions, I need to go to court'. (PLD3)*

Although the library provides the students with those primary resources as print documents and they are available through local legal databases, such as Kuwait Lawyers, some of the student had to travel to the court to acquire the latest legislation and decisions issued. It can be argued here that students in this field believed that the court could provide them with recent primary information to meet their topic-specific needs better than the library. This might be because they developed a negative attitude about the library services in the earlier stages that made them avoid using its resources, or maybe they had no faith in the currency of the primary resources provided by the library. Therefore, they used other available information sources outside the university library to meet their information needs.

#### 8.4.2.2 Travelling abroad to acquire secondary resources

The most interesting issue that emerged from the data relating to the majority of the participants in this case study is that they travelled abroad to obtain topic-specific resources, such as monographs. It was found that public law students had to travel outside the country to acquire information resources such as monographs from the very beginning (Section 8.3.1.2). It can be inferred here that the shortage of topic-specific Arabic books locally (Section 8.3.6.1) and even online might be one of the reasons that persuaded the students to travel to the source to get what they needed:

*'After I completed my search for information resources in Kuwait and was certain that I had covered all related books, I decided to travel to Egypt to search for more information resources ... I am now expected to complete the research plan. I travelled to Egypt and searched for information resources in the university libraries and also went to bookstores and I bought many information resources'. (PLD3)*

Not only do public law students travel to seek specific Arabic legal books, but some also seek specific foreign language books:

*'I travelled to London and joined the British Library .... Then I used the electronic catalogue provided by the British Library and extracted the books I thought would be useful, then requested them'. (PLD8)*

Due to the professional nature of the discipline, public law students may travel abroad to attend some court sessions in other Arabic countries to observe how the law is applied in real cases in Arabic contexts when it is not locally applied:

*'I am planning to visit the court in Egypt to observe how the law is applied to solve real world practical cases ... when I go there, I will be able to observe practically how it has been applied and how the cases were discussed based on it'. (PLD6)*

It can be argued here that the travelling behaviour of law students in this field is extremely unexpected as it has not been cited anywhere in the literature. This might be attributed to the local lack of specific resources related to public law, the culture of the public law discipline, the culture of the students, the tendency of law students to build their own personal collections or other factors. Therefore, in the conclusion the researcher will suggest further research to investigate to what extent travelling behaviour to acquire information resources in the public law field can affect the use of the library by graduate students when conducting their research.

## **8.5 The social organisation of the public law field and information use and behaviour**

This section discusses the cultural characteristics of the public law field based on Whitley's two concepts of 'mutual dependence' and 'task uncertainty'. The cultural identity of this field and its relationship with the information use and behaviour of the graduate students is presented in Sections 8.5.1 and 8.5.2.

### 8.5.1 Cultural identity of the field

The focus of the research culture in this field appeared from the participants' responses to be based on analysing examples of applied laws, with a mix of theoretical, soft-pure influence and practical, hard applied influence (see Chapter 2, Section 2.6.1):

*'I depended on books mainly to create that chapter, and then I found myself searching for statistical facts to build up the second chapter, in order to make sense of the statistical facts I had to review many laws and legislation ... I examined and studied the statistics published in many newspapers and journals...'. (PLD7)*

The public law field has an intellectual tendency towards using the applied science approach to co-ordinate and control research projects as the standardisation of research methods is a major concern:

*'In our field, we follow the same methods which are an analytical approach. We have to study the law in detail and, as I said before, we analyse the laws by reducing, breaking down and separating the law into separate elements, and we have to show what can be said in something new. So we didn't choose the methodology based on the research topic. We used the same method to analyse the laws and all the graduate students in our field follow the same approach'. (PLD1)*

Graduate students in this field rely upon their individual control to carry out their research work. This fits with Whitley's (2000) description of a domain that has a high degree of 'technical uncertainty' (see Chapter 2, Section 2.6.2.1). As 'technical uncertainty' grows, considerable local variations can be observed in research objects and techniques. For example, when they selected their topics in the proposal stage, the students were uncertain about what tools to use to tackle their research problem, which indicates limited technical control over the empirical phenomenon:

*'The law I am studying has not been applied before in Kuwait, so I need to seek specific people perspectives say legal advisor. I need to seek their opinion to understand from their perspective how the law can be applied in Kuwait and what are the possibilities of the applications. From here, I decided to use questionnaire... my topic requests the use of both types of data. So I need to conduct a questionnaire and I need to collect people's perspectives and opinions. So the nature of my topic controls the types of data I need to collect to answer the questions'. (PLD6)*

In addition, a variation in the way in which the participants choose their research topic was observed in this field, which indicated there was no common method in selecting research problems. This means that research problems and theoretical approaches in this field are varied. This can be attributed to the high uncertainty in the task outcomes, which means it is difficult to establish standardised research techniques and tools. These characteristics are associated with a low degree of ‘strategic uncertainty’. Whitley (2000) indicated that a combination of a high degree of ‘technical uncertainty’ and a low degree of ‘strategic uncertainty’ means that the implications of theoretical problems are unclear and subject to different interpretations. Therefore, control over research problems in the public law field is relatively low compared to the microbiology field.

According to Whitley (2000), this field seems not to be very stable<sup>2</sup>, so placing restrictions on research topics as a local way to deal with technical problems allows some research techniques to be fairly standardised and formal. Therefore, in choosing their topics, students in this field are restricted to general and theoretically derived problems. They confirmed that they used common technical procedures to analyse their data.

Because of technical limitations, informal face-to-face communications was essential for students in the public law field to co-ordinate and control their research project. For instance, to understand the application of the law to support the discussion in their theses, graduate students needed to communicate with experts in their field:

*‘I would ask experts, including academic staff, legal advisors, and others, who might have enough knowledge of my topic. I would interview them officially or have an informal conversation to clarify ideas and issues’. (PLD6)*

Moving towards creating a lower degree of ‘strategic uncertainty’ and a higher degree of ‘technical uncertainty’ within a specific field means that the degree of ‘strategic dependence’ will increase and the degree of ‘functional dependence’ will decrease (high strategic and low functional dependence) concurrently. This may result in a moderate degree of ‘mutual dependence’ and a moderate degree of ‘task uncertainty’. Accordingly, this field is characterised as having a moderate degree of ‘mutual dependence’ and a moderate degree of ‘task uncertainty’ in comparison with the Islamic history and electrical engineering fields. In

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<sup>2</sup> According to Whitley (2000), stability means the strength and hierarchies of research topics, problem areas and research teams.

this case, the social organisation of the public law field is both tightly structured and loosely structured, which leads to variation in the level of co-ordination and control of research work within the field and across the discipline (Whitley, 2000). This has resulted in centralised control over accessing resources at the local level and decentralised control at the international level.

### **8.5.2 Disciplinary shaping of information use and behaviour**

Two distinct approaches for using information in this field can be observed, and this shaped the information use and information behaviour of the graduate students. As the ‘task uncertainty’ in this field is moderate (low strategic and high technical uncertainty), the co-ordination and control over research outcomes become limited either nationally or internationally. This increases the contextual and local nature of the knowledge in this field. A local centralised control over resources can be observed in this field as a consequence of mitigating the degree of ‘functional dependence’ by the relatively high degree of ‘technical uncertainty’. Therefore, this field has specialist digital resources that tend to be co-ordinated at the local level. For example, public law students used a specialised database (Kuwait Lawyers) to communicate legal information at a local level and not international databases, as in the electrical engineering field. The prime example of sources accessed and used locally in this field is unpublished sources, such as the court and specialists’ commentary.

The theoretical aspects of the public law field share more patterns of information use and information behaviour with Islamic history in terms of seeking information resources from a variety of legal sources and using books as a main source of information. The degree of ‘strategic uncertainty’ is mitigated by the relatively high degree of ‘technical uncertainty’, which increases the decentralised control over resources at the international level. The failure of research problems to be hierarchically ordered because of the ambiguity of results in this field leads to variation in the resources used. The moderate degree of ‘mutual dependence’ (high strategic and low functional dependence) shaped the students reliance on formal print publications as information resources, as in IHD. Whilst, the moderate degree of ‘task uncertainty’ helps in shaping the students’ reliance on their personal networks to contact personally with professional colleagues (e.g. legal advisors) to acquire professional information, in addition to shaping their independence from their supervisors to search for and access theoretical information, as in IHD. Therefore, the library plays a central role as an information source to fulfil the students’ information needs.



The technical area of the public law field shares more patterns of information use and behaviour with electrical engineering—where some technical standardisation exists and work can be co-ordinated around common problems—students need to some extent to depend on their supervisor as information sources to make sense of their results. This is a consequence of a moderate degree of ‘mutual dependence’. The existence of two diverse cultures within the public law discipline creates a conflict in the communication system across the field.

## **8.6 Key characteristics of the public law field**

According to the analysis of the cultural characteristics of this discipline and based on Whitley’s two key concepts, this field can be characterised as having a moderate degree of ‘mutual dependence’ and a moderate degree of ‘task uncertainty’ which shaped the information use and information behaviour of the graduate students. These characteristics are presented in Sections 8.6.1, 8.6.2, 8.6.3 and 8.6.4.

### **8.6.1 Characteristics related to the culture of the discipline**

Due to the culture of this discipline, several characteristics can be observed that shaped the information use and behaviour of the graduate students:

- The moderate degree of ‘mutual dependence’ shaped the students high reliance on formal print publications, and limited dependency on their supervisor for acquiring and accessing information.
- The moderate degree of ‘task uncertainty’ shaped the students reliance on personal contact with specialist in the field to acquire information, and enabled both centralised local and decentralised international communication system via digital resource.
- Centralised local control over resources encourage to use centralised field-based digital resources (e.g. Kuwait Lawyers database)
- The decentralised control over resources in this field encourages the student to use non-university library such as specialist libraries as external sources.
- Books are the main communication channel for information in this field.
- The library is an important source of information for graduate students to carry out their research.
- Indexing and abstracting services were used to identify relevant literature.
- The professional nature of this field determines the types of sources used by graduate students to access legal information such as specialists’ commentary and the court.

- The dominant use of Arabic language in this field made the students reluctant to access and use library foreign language databases, such as Westlaw.

### **8.6.2 Characteristics related to the role of the supervisor**

Some characteristics related to the educational role of the supervisor in this field can be observed that shaped the information use and behaviour of the graduate students:

- The educational role played by the supervisor as a source of guidance rather than as an information provider encouraged the students to be independent in searching for information relating to their research topics.
- The supervisor tended to take over the role of the library and provide the students with the required support when the library failed to meet the students' information needs.

### **8.6.3 Characteristics related to the Law Library**

Additional issues related to the library resources and services that affect the information use and behaviour of the graduate students include:

- The lack of topic-specific Arabic books in the library's collection made the students dependent on other available sources to meet their needs, such as travelling and supervisors' personal collections.
- The inability of the library to meet the students' professional needs made the students reluctant to use the library in later stages.
- The low service performance of the library made the students develop negative attitudes about using the library.
- The low English language skills of the library staff made the students avoid seeking their help to access foreign language resources.
- The inability of the library to advertise its services to the students effectively made the students depend on their own training and on their supervisor's support.

### **8.6.4 Characteristics related to the public law students**

Not only did cultural characteristics have a great impact on the information use and behaviour of the graduate students but so did the characteristics of the students in this field:

- Graduate students prefer to access and use library print resources more than electronic ones.

- Browsing the shelves was the preferred method for locating information resources in addition to the library catalogue.
- Students show little preference to access and use e-journal articles.
- Students depend on their personal networks to access and use information resources.
- Students contacted their supervisor or professionals in the field personally to make sense of their results.
- The students' bad experiences with the library staff help in building negative attitudes about the library services.
- The students become dependent on their supervisor's personal collection and on travelling to acquire the information resources they need when the library fails to meet their information needs.
- The students' professional needs influence their interaction with the library, and this develops throughout the research process.
- Cultural issues, such as adequate finances, encourage the students to buy the resources they need, which negatively affects their use of the library. The diagram below (Figure 8.1) illustrates the main characteristics of the public law field, as suggested by the interviews summarised in this chapter.

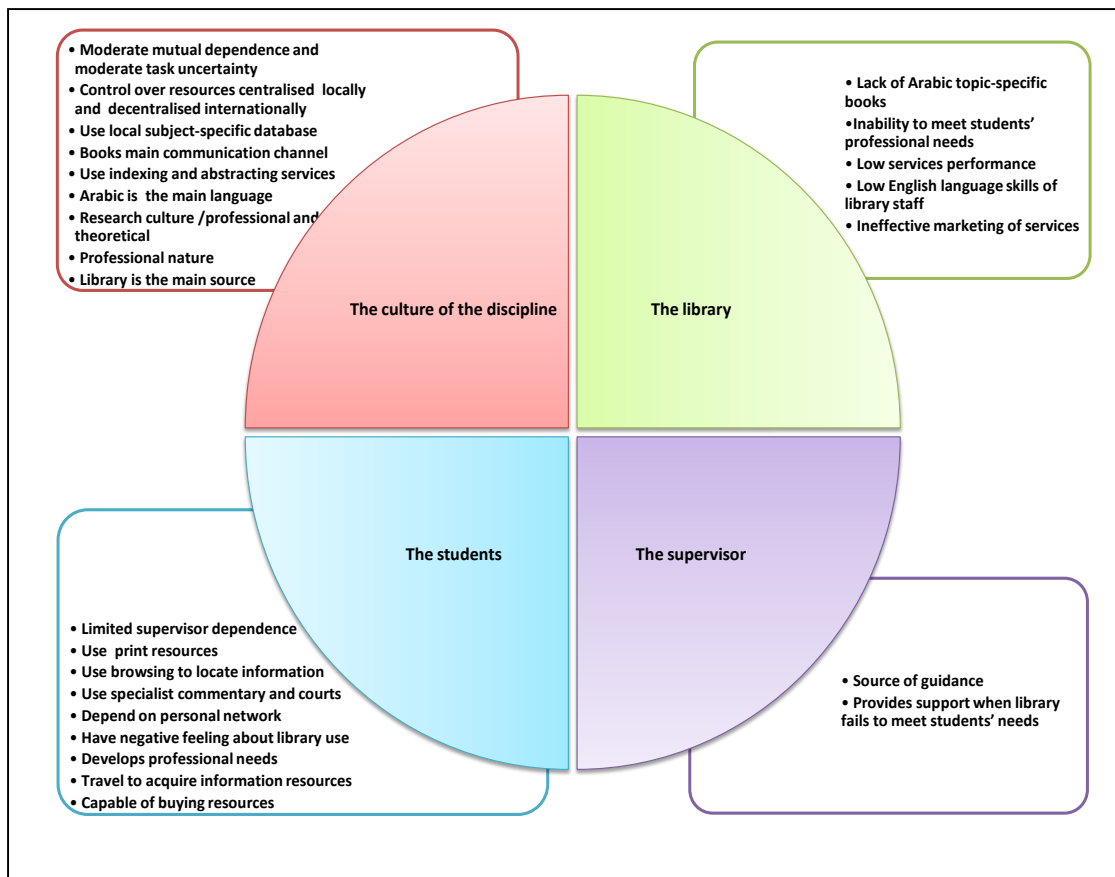


Figure 8-1 Key characteristics of the public law field at Kuwait University

## 8.7 Overall summary

According to the findings of this case study and due to the nature of the discipline, information needs, study mode, students' personal experiences, library information services, external sources and financial adequacy are the key factors identified that affect the information use and behaviour of graduate students and the research stages, which appeared to be an interacting factor that influences the use of the library by graduate students studying at KU. The nature of the public law discipline, which entails the need for professional information, determines the types of information resources to be used, such as specialist commentary that is not provided by the library. The research culture of this field, based on searching for textual legal information such as books and journal articles, made the students dependent on the university libraries as main sources of information. The limited availability of the part-time students on campus and the limited accessibility of the library off campus made the students dependent on external information sources more than on the library.

The lack of topic-specific books combined with low library service performance made the students develop negative attitudes toward using the library from the very beginning. Therefore, a lack of communication between the library staff and students was recognised. As the students built their research on a stage-by-stage basis, the role of the library role appeared to decline because of the library's inability to meet students' professional needs. Therefore, the students tended to use other available information sources or travel outside the country to fulfil their needs. They also tended to buy their own resources because they had the financial ability to do so and because they wished to build their own personal collections. The lack of effective marketing of online library services also negatively influenced the role of the library.

The overall image of the university libraries in this case study tended to be negative. The library appeared to be unable to place its services at the heart of the department. The supervisors tended to take over the library role and provide the students with the necessary support by initially supplying them with information resources and the required information skills later on. The students' lack of trust in the library service negatively affected its image. The library became the second, and even sometimes the third or fourth option for students, after supervisors, other professional libraries and bookstores.

The cultural context of this field was identified as an important factor that influences the information use and behaviour of graduate students. As there is a moderate degree of 'mutual dependence' and a moderate degree of 'task uncertainty' in this field, both local centralised and international decentralised approaches to using information resources were adopted. Centralised local digital resources play a role in acquiring information, and print resources are more preferable in terms of accessing and using legal information. Both theoretical and professional information play a significant role in the students accessing and using information sources to carry out their research. These are in addition to their limited reliance on specialists, such as their supervisor, for acquiring and accessing information and their need to personally contact specialists to gain professional information through their personal networks.

Many emerged observations would need support from other fields or more data given the small sample size to formulate hypotheses to be tested in further research to explain the relationship between the library's supporting role and the factors identified. These hypotheses can act as the research contribution to facilitate our understanding of the complex set of interacting factors that influence the pattern of library use, in addition to the influence of the travelling behaviour of the students to acquire the information resources, which is the most important characteristic of this field.

Ultimately, improving the library's role and contributing to public law students' research processes probably depends on the library's ability to promote its services effectively, develop its book collection, improve the current digital systems, address other weaknesses and focus on what the cultural context of the public law field requires to satisfy the information needs of the students.

## CHAPTER 9 – CROSS-CASE ANALYSIS

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### 9.1 Introduction

The purpose of this chapter is to synthesise the empirical findings across all four cases (the electrical engineering, microbiology, public law and Islamic history disciplines) to identify any similarities and differences between the degree of library use by graduate students and the effects of cultural identity factors on the role of the library throughout the research stages. By identifying any similarities and/or differences, the researcher seeks to provide further insights into issues relating to the library's role in supporting graduate students' research. The cultural identity factors that shape library use have been described in Chapters 5–8. The next step is to conduct further analysis of the consistencies identified across the cases through the various relationships, along with the reasons why these relationships exist (Yin, 2009). In order to complete the analysis process, Whitley's (2000) theory—which consists of the two dimensions of 'mutual dependence' and 'task uncertainty'—was used to identify the cultural differences between the four disciplines and how these shape the information use and behaviour of the graduate students.

This chapter is divided into four sections. The first (Section 9.2) presents the results from the cross-case analysis of the four studied cases. The second (Section 9.3) discusses the exceptional characteristics of the studied disciplines that emerged from the synthesis of the data from the cross-case analysis. The third (Section 9.4) presents the cultural context of the disciplinary results across the four studied cases and how this shapes the graduate students' information use and behaviour. The fourth (Section 9.5) discusses the main findings of the cross-case analysis.

### 9.2 Cross-case analysis and cultural identity factors shaping library use

Seven cultural identity factors that shape the role of the library were identified (in Chapters 5–8) in the case analysis: (1) the nature of the discipline; (2) information needs; (3) study mode; (4) students' personal experiences; (5) library services; (6) external sources and (7) financial adequacy. Throughout the comparative analysis of the four disciplines, several major differences and/or similarities regarding library use are highlighted. These are discussed in the following sections.

## 9.2.1 The nature of the discipline in shaping the library's role

The specific nature of the graduate students' academic disciplines is identified as one of the cultural identity factors that affect their library use. The findings from the previous chapters (5–8) revealed that the nature of the discipline influenced two elements: topic selection and the nature of the topic. These elements are discussed across all four cases based on their influence on the library's role (use) throughout the research stages. Table 9.1 summarises the differences between the disciplines in terms of the nature of the discipline cultural identity factor.

**Table 9-1 Differences between disciplines throughout the research stages and across the cases related to the nature of the discipline cultural identity factor**

Cultural identity	Specific elements	Related issues	Research stages	EED	MCD	IHD	PLD
<i>The nature of the discipline</i>	Topic selection	Supervisor-based selection	STAGE ONE	Supervisor selects the topic	Supervisor suggests the topic	Supervisor selects the main topic	Supervisor does not suggest the topic
	The nature of the topic	Originality of the topic	Unaffected by research stages	Original design nature	Original experimental nature	Original historical nature	Original professional nature
	Information sources and resources	STAGE ONE	<b>Supervisor</b> <ul style="list-style-type: none"> <li>Journal articles</li> <li>Text books</li> </ul> <b>Others</b> Design software	<b>College library</b> <ul style="list-style-type: none"> <li>Journal articles</li> <li>Books</li> <li>Theses</li> </ul> <b>Others</b> Software library	<b>University libraries</b> <ul style="list-style-type: none"> <li>Journal articles</li> <li>Books</li> <li>Theses</li> <li>Manuscripts</li> </ul> <b>Others</b> Personal collections Google	<b>College library</b> <ul style="list-style-type: none"> <li>Journal articles</li> <li>Books</li> <li>Theses</li> <li>Decisions and legislation</li> </ul> <b>Others</b> Professional libraries Google	
			STAGE TWO	<b>Supervisor Specialist</b> <b>College library</b>	<b>Supervisor Specialist</b> <b>College library</b> <b>Others</b> Health Sciences Library	<b>Supervisor Specialist</b> <b>University libraries</b> <b>Others</b> Travel to the source	<b>Supervisor Specialist</b> <b>Others</b> Travel to the source Personal network Private collection Other libraries
			STAGE THREE	No reflection provided	No reflection provided	Reflection on their experience with books from their personal collection	Reflection on acquiring specific legal books by travelling abroad

The differences and similarities across the cases regarding the nature of the discipline cultural identity factor are discussed in the following two sections (9.2.1.1 and 9.2.1.2).



### 9.2.1.1 Topic selection

Graduate students at KU have to choose a topic for their research that must be approved by their supervisor. This choice should be made at the very beginning of the first stage of their research. The analysis shows that the supervisor's behaviour regarding the topic selection differs from one case to another (Table 9.1). For instance, in EED, most<sup>3</sup> of the participants confirmed that their supervisor selected the topic and supplied them with the relevant resources to learn about the topic. In MCD, almost all<sup>4</sup> the participants indicated that their supervisor suggested more than one topic and the students had to select one after searching the literature. In IHD, most of the participants confirmed that they were guided by their supervisor when selecting their topic. The supervisor selected the main topic and the students had free choice to select their sub-topic after searching the literature. However, in PLD, most of the participants confirmed that their supervisor did not play any role in the topic selection process. The students had the responsibility to choose their topic and to convince their supervisor about its validity to obtain his/her agreement.

As a result, the students in EED did not need to use the library to conduct background reading during the first stage, as their supervisor met their information needs. In MCD, as the supervisor did not equip the students with any information resources but encouraged them to visit the library, they used the library to meet their needs. However, in IHD, most of the participants confirmed that the university libraries (both the Arts Library and the Central Library) were the first sources to find background information about the main topic selected by their supervisor to decide which sub-topic to choose. In PLD, most of the participants stated that they selected a topic of their own choosing using different methods and that their supervisor played a smaller role in selecting their topic; therefore, the law students used the library to meet their information needs.

Ultimately, in light of the above facts and corresponding to the topic selection elements across the four cases, it can be stated that:

- As the supervisor selects the topic and provides the students with relevant resources, there will be less need to use the library resources and services (EED).

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<sup>3</sup> Most = 7 participants out of 12

<sup>4</sup> Almost all= 11 participants out of 12

- The library will be used more by the students when selecting their topic if fewer alternative information sources are available, such as their supervisor (IHD, MCD and PLD).

To sum up, the use of KU libraries in relation to the nature of the IHD, MCD and PLD disciplines and the topic selection process is high because the supervisor motivates the students to use the library resources and services to carry out background reading. Low library use is identified in EED because the supervisor acts as an information provider and supplies the students with the relevant resources to meet their information needs in the first stage of their research.

### **9.2.1.2 The nature of the topic**

The analysis shows that each discipline has its own characteristics and needs that shape its identity and the nature of the research topic. According to the accounts provided across the studied cases, the nature of the topic, including its originality, is influenced by the nature of the discipline. This in turn influences the types of information sources used. The relationship between these elements is discussed in the following sections.

#### **9.2.1.2.1 Information sources and resources used**

The findings show that the type of information sources used by the graduate students was affected by the nature of the discipline that shaped the nature of the topic. In addition, the task performed (e.g. designing) during the research stages has an effect on the students' interaction with the library's resources and services (Table 9.1). This will be discussed in relation to each of the research stages, as follows.

#### **Stage 1: Proposal development stage**

The cross-case analysis revealed that the availability of alternative sources, such as the supervisor, Google, professional libraries, personal collections, etc., to build the research proposal had an influence on the supporting role of KU libraries. This is discussed below.

##### **a. The library as an information source**

MCD, IHD and PLD participants agreed that they used the library during this stage to build their research proposal. For example, most of the PLD participants indicated that the first source they had to access and used to build their research proposal was their college library. Similarly, most of the IHD participants confirmed that they depended on the university libraries

(the Arts Library and the Central Library) as the main source to meet their information needs. Almost all the MCD participants indicated that they had to visit the library to use the specific database for their field (e.g. Science Direct) and other resources to complete their research proposal. Most of the EED participants stated that they depended mainly on their supervisor to supply them with the information resources to build their research proposal instead of the library.

The MCD participants agreed with the PLD and IHD participants that they needed to visit the library physically at this stage to obtain secondary sources, such as books and theses, to build their research proposal. However, a difference was found between the disciplines regarding the purpose of using these types of resources according to the nature of the discipline. For example, most of the MCD participants confirmed that they used books (textbooks and edited books) to access the basic and specific information to complete their research proposals. Most PLD and IHD participants confirmed that they mainly used books for background reading and to obtain a list of references relating to their topic. However, most IHD participants confirmed that they mainly used reference works and monographs to build their research proposals. Most of the EED participants confirmed that they used only textbooks to obtain basic information at this stage.

The library's thesis collection was used for different purposes. For example, the IHD participants indicated that they used the library's thesis collection to track the references relating to their specific topic. The PLD participants confirmed that they had to search the library's thesis collection to ensure that their topic had not been studied in Kuwait before. Most MCD participants confirmed that they used the library's thesis collection to check the methodology used by colleagues in the same field and the availability of the materials needed at KU to conduct experiments. Only one EED thesis student in this stage confirmed that she used the library's thesis collection to undertake background reading about her topic.

Regarding journal articles, the nature of the discipline in EED and MCD requires up-to-date information. Therefore, the participants confirmed that they used e-journals to develop their research proposal more than any other resources. For example, MCD participants confirmed that they needed to conduct an initial experiment to check the applicability of their topic to the Kuwait environment as a prerequisite for completing their proposal. Accordingly, they needed to access the library database to search for journal articles. Similarly, most EED participants confirmed that they depended mainly on the articles provided by their supervisor, followed by searching the library databases, such as IEEE or the Internet when they needed further up-to-

date information. Most PLD participants stated that they used the library to search for print journal articles in Arabic when they needed up-to-date information. Some IHD participants confirmed that they used the library either to search for print journal articles in Arabic or to access the library database to search for foreign journal articles.

There was a difference in the types of information resources used according to the nature of the discipline. For instance, in IHD, due to the historical nature of the discipline, most of the participants confirmed that they needed to use manuscripts as primary sources in order build their research proposal. Therefore, they had to visit the archival department at the Central Library and not the Arts Library (the Women's Library). In PLD, due to the professional nature of the discipline, the participants needed to use decisions and legislation as primary sources to complete their research proposals. Regarding EED, because of the design nature of the discipline, most of the participants confirmed that to implement the model of the design in the lab, they needed to use design software that the library did not provide. Similarly, according to the experimental nature of the discipline in MCD, the participants confirmed that they needed to use the software library available via the lab devices to verify their experimental results and complete their research proposals. In this case, the type of information resources used was determined by the nature of the discipline and the tasks to be performed.

#### **b. Other information sources**

Because of the nature of their disciplines, the IHD and PLD participants were heavy users of information resources. For example, the IHD participants confirmed that they tended to use the Central Library because its collection was richer than that of the Arts Library. However, if the item they needed was unavailable in the university libraries, they tried to obtain it from the local libraries or other archival institutions. In addition, most of the IHD participants confirmed that they used their personal collection of books to build their proposal, and some used experts in their area of interest as information sources.

Most of the PLD participants confirmed that at this stage they tended to collect all the possible information resources and build their personal research-related collection for use later during their actual research. If the library could not supply the students with the information resources needed, they would use alternative ways to fulfil their information needs. Accordingly, all the public law participants at this stage confirmed that they used professional libraries to meet their information needs. In this case, the library would be used less to build the proposal, as other

sources are available, such as personal collections, experts in the field, professional libraries, etc.

Most of the IHD participants at this stage confirmed that they used Google to download e-books or journal articles in Arabic that were available for free on the Internet. In addition, most of the PLD participants confirmed that they used Google to obtain recent legislation and decisions from government websites or journal articles. For this reason, the students would use the library information resources less frequently to build their proposals, as other sources of information, such as Google, are available outside the university library.

Most of the EED participants confirmed that they depended on their supervisor more than on any other source in helping to build their research proposals. In this case, the library would be used less than other information sources, such as the supervisor. All the MCD participants, however, confirmed that their supervisor did not act as an information source at this stage but merely encouraged them to use the library more than any other source; so in this case, the library would be used more, as other information sources, such as the supervisor, are less available.

Ultimately, in light of the facts identified and the nature of the discipline element across the four cases, it can be stated that:

- The library will be used more in building proposals when there are fewer alternative information sources available, such as the supervisor (MCD).
- The library will be used less in building proposals when there are more alternative information sources available, such as the supervisor, professional libraries, personal collections, etc. (EED, PLD and IHD).

To conclude, the role of the library in relation to the nature of the discipline is low in EED, PLD and IHD in terms of information sources and resources because of the availability of other information sources, such as the supervisor, professional libraries, personal collections, etc. In MCD, the relationship is the opposite because of the unavailability of the supervisor as an information source.

## **Stage 2: The mid-stage (data collection, data analysis and writing up)**

At this stage, the findings show that the high demand to complete the research project has a positive influence on the graduate students' library use. This is discussed across the studied cases, as follows.

### **a. The supervisor**

The participants in the four studied cases established that the supervisor was the most important information source when they wished to analyse their data. For example, in EED, the participants (both thesis and non-thesis) confirmed that they needed to process the data they had collected in this first stage to generate their actual research results. As they spent most of their time working in the lab modifying their results to create a new design, their most easily accessible information source was the supervisor. Similarly, in MCD, all the participants confirmed that when conducting an experiment as part of their actual research, the first source of information they used was their supervisor. As they used different devices and materials in the lab, they needed to consult their supervisor about the application of the experiment as well as about locating information relating to their specific topics to generate the anticipated results. Likewise, in PLD, most of the participants at this stage confirmed that the analysis process demanded professional information that was not provided by the library. Students at this stage needed to discuss any ideas that arose during the analysis procedure with their supervisor to develop their research scope. Therefore, to support their argument and build a strong background for the new ideas that arose, the supervisor tended to supply them with suitable information resources. In IHD, most of the participants at this stage confirmed that they used their supervisor's guidance when tracking down particular primary sources (e.g. manuscripts) that were difficult to find. In this case, the nature of the discipline affects the role played by the supervisor as an information source.

### **b. Specialists in the field**

The participants in the four studied cases also confirmed that they not only used their supervisor as an information source but also needed to use specialists in their field. For example, most MCD participants confirmed that they needed to seek the advice of other academic staff or lab technicians to understand their experiment results. Similarly, most EED participants in this stage confirmed that they needed to consult other academic staff regarding their unexpected results. Most PLD participants confirmed that to understand the creation aspect of the law and identify the drawbacks related to its application, they used specialists' commentaries to

strengthen the argument of their theses. Some IHD participants confirmed that they contacted experts in their subject area to request information resources from their personal collections or that they travelled abroad to seek expert advice.

### **c. The university libraries**

The EED, MCD and IHD participants confirmed that they continued to use the library resources and services at this stage, as needed. For example, in IHD, as the writing-up process often proceeds in parallel with the analysis due to the nature of the discipline, most of the participants confirmed that they continued to use the Central Library to consult manuscripts as primary sources and reference books that were available in both libraries. Some used reference works, such as Islamic encyclopaedias, Arabic thesauri or maps available in monographs. Others used Arabic literature and the library's thesis collection. Similarly, in MCD, although the participants during this stage were busy in the lab processing their experimental data and verifying their results, they confirmed that it was necessary to carry out further literature searches to find the best method for conducting their experiments. Therefore, most of the participants at this stage confirmed that they used the library's subject-specific database (Science Direct) to obtain e-journals when they wished to finalise their results and write up their theses. However, when the articles they needed were unavailable in electronic format, they physically visited the library to check its print journal collection or to request them via the ILL service. Moreover, some of the participants whose topic was related to medical or health sciences confirmed that they physically visited the Health Sciences library to access medical journal articles online or to use its ILL service to request certain articles. Some also confirmed that they visited their college library to use its reference collection, photocopying and printing services, the card catalogue or the library space to complete their theses.

Most EED participants stated that they needed to use the library collection when they wished to finalise their research projects or theses. Most of the participants at this stage confirmed that they used the library's EIRs, such as the IEEE database, to obtain e-journals. However, some of the participants confirmed that they became more dependent on the ILL services when the library's IEEE subscription license had expired. Some also used the library's photocopying and printing service or library space to complete their theses. Some used the library's thesis collection to learn how to structure their theses or research projects. In this case, the great demand to complete the research projects or theses positively affected the students' use of KU libraries.

However, in PLD, the use of the library resources at this stage decreased as the participants had already collected all the possible resources related to their specific topic in the first stage and identified all the potential channels that could provide them with primary sources. Most of the participants confirmed that they depended on their personal networks to obtain primary sources from governmental bodies or legal institutions. Some of the participants confirmed that they used other university libraries when their college library's book collection failed to meet their topic-specific needs. It was interesting that the PLD participants confirmed they had to travel to other countries where the resources related to their specific topic were available. The IHD participants confirmed that due to the nature of the discipline they had to travel from their home institution or sometimes go abroad to validate their theories or hypotheses, in addition to acquiring the resources relating to their specific topics, such as monographs, to meet their needs. Some PLD participants confirmed that they used other resources, such as the media, government documents or legal encyclopaedias from other professional libraries or their own private collections. In this case, the PLD participants' library use decreased as more alternative sources, such as the supervisor, personal collections, professional libraries, etc., were available to meet their information needs.

Ultimately, in light of the facts identified and corresponding to the nature of the discipline element across the four cases, it can be stated that:

- There will be more library use when there exists a greater demand to complete the research project during the mid-stage (EED, IHD and MCD).
- There will be less library use when there are more alternative sources available for completing the research project, such as professional libraries, personal collections, travelling, the supervisor, etc. (PLD).

In summary, the role of the library in relation to the nature of the discipline is high in EED, MCD and IHD in the mid-stage because the high demand for completing the research project or thesis affects the students' library use positively. In PLD, the role of the library in relation to the nature of the discipline is low because of the shortage of a specific library collection in Arabic and the use of other alternative channels of information identified in the first stage to meet the students' needs, such as professional libraries, the supervisor, private collections, travelling, etc., in order to complete their theses.



### **Stage 3: Reflections on the students' experiences**

Regarding the participants' reflections on their experiences with the library throughout the research stages, the cross-case analysis revealed that a lack of topic-specific information resources in the form of books, which was only found for PLD and IHD students, had a significant effect on their library use. Some of the PLD participants confirmed that what delayed their thesis submission was a lack of topic-specific resources, such as legal books, to finalise their theses. Most IHD participants reflected on their experience of building a considerable private collection that they used later in the final stage, which reduced their library use. However, MCD and EED participants did not reflect on any experiences with the library after submitting their research projects or theses.

#### **The originality of the topic**

Another issue that was influenced by the nature of the discipline, including the nature of the topic, and that was identified across the cases is the originality of the topic. All the participants in this research indicated that they had to select an original topic to be eligible to register for the research project, and this was the case from the first research stage. The findings show that the originality of the topic influenced their library use but was unaffected by the research process. Across all the studied cases, the role of the library appeared to be influenced by the originality of the topic (Table 9.1). For example, in EED, the design nature of the discipline and the problem-solving approach used requires immediate information. Because of the novelty of the research topics, up-to-date information is also needed. In this case study, most of the participants needed to access the library's e-resources, such as IEEE, because they believed that those resources would provide them with the latest information about their field. Likewise, in MCD, the experimental nature of the discipline and the need to conduct novel experiments in the lab requires up-to-date information. Therefore, most of the participants indicated that they had to use the library's subject-specific database (Science Direct) to obtain specific information related to their research topics. In both cases, the originality of the topic appeared to have influenced the participants' interaction with the library's resources and services, meaning that the more original the students' topics, the more they needed to use the library's e-resources. In PLD, the theoretical and professional nature of the field requires both published and unpublished information. Most of the participants confirmed that the originality of their topics required specific legal information in the Arabic language because the instruction language in the public law field is Arabic. However, most of the legal databases to which KU subscribes are in English. These subject-specific databases are not useful for students who seek

legal information in Arabic. Moreover, the lack of topic-specific information provided by the library, particularly in Arabic, reduced the students' use of their college library.

Similarly, in IHD, due to the historical nature of the discipline, the participants needed to use historical monographs, particularly in Arabic, as their course is taught in Arabic. However, most of the historical databases to which KU subscribes use English, which is not useful for students who seek information in Arabic. Most of the participants indicated that the lack of topic-specific information in the form of historical monographs, particularly in Arabic, in both libraries affected their library use negatively. In both cases, the originality of the topic combined with a lack of topic-specific resources in Arabic negatively affected the supporting role of the library throughout the research stages.

Ultimately, in light of the facts identified and corresponding to the nature of the discipline element across the four cases, it can be stated that:

- The more current the topics chosen by the students, the more they need to use the library's e-resources (EED, MCD).
- The more current the topics chosen by the students, particularly in Arabic, the less they need to use the library's subject-specific databases (IHD, PLD).

To sum up, the role of KU libraries in relation to the nature of the discipline is high in EED and MCD because the students' need for specific, up-to-date information required the use of the online databases to which the library subscribes. The opposite is true for IHD and PLD because most of the subject-specific databases available in the library are in English, which was not useful for students whose language of instruction is Arabic. Therefore, the originality of the topic, particularly in Arabic, reduces the students' use of the library's online database.

### **9.2.2 Information needs shaping the library's role**

In this study, the information needs, as defined in Chapters 5–8, consisted of the need to use specific sources of information to complete research. Information awareness, information skills capability, information culture and IT tool needs were four elements identified that shaped the information needs cultural identity factor across the studied cases. These elements are discussed in relation to KU libraries' role throughout the research stages. Table 9.2 summaries the differences between the disciplines relating to the information needs cultural identity factor.

**Table 9-2 Differences between the disciplines throughout the research stages and across the cases in relation to information needs cultural identity factor**

Cultural identity	Specific elements	Research stages	EED	MCD	IHD	PLD
<i>Information needs</i>	Information awareness	STAGE ONE	Unaware which important source to use	*	*	*
	Information skills capability		*	Ability to identify the reliability of Internet information	*	*
	Information culture		*	*	*	Seek theoretical-based information from the library
	IT tool needs		*	*	Prefer browsing and traditional finding aids	*
	Information awareness	STAGE TWO	Focused and more aware about important sources		*	*
	Information skills capability		*	Able to search, access and evaluate library resources (e.g. Science Direct)	*	*
	Information culture		*	*	*	Seek professional information from supervisor and specialists
	IT tools needs		*	*	Use IT tools, such as OPACs and online manuscripts index	*
	Information awareness	STAGE THREE	Information awareness developed throughout the research stages	*	*	*
	Information skills capability		*	Capable of making a decision about which important sources to use	*	*
	Information culture		*	*	*	No reflection on students' experiences after submission
	IT tools needs		*	*	IT tool needs develop as the demands of the research stages increase	*

\* No influence of the element appeared

The differences and similarities across the cases and throughout the research stages regarding the information needs cultural identity factor are discussed below.

### Stage 1: Proposal development stage

The analysis shows that information awareness about the important sources the students need to use affects their interaction with the library. The EED participants confirmed that their lack of knowledge about what important sources could be used to meet their information needs in the first stage (Table 9.2) made them use any sources that were ready available and easy to access. Usually, they used their supervisor as an information source to supply them with

relevant information resources to better understand their topic. Some EED participants confirmed that the scholarly journals available on the Internet relating to their topic directed them towards the most important databases in their field, such as IEEE. Therefore, the lack of awareness about the important source in this case negatively affected library use. In other words, the more unaware the students are about what important sources can be used to meet their topic-specific needs, the more they depend on their supervisor as an information source.

In MCD, the students' ability to seek, access, search, retrieve, evaluate and use specific information sources to fulfil their needs affects their interaction with the library. The MCD participants confirmed that they were able to conduct independent searches for information in the library and also assessed the reliability of the information in terms of whether it is authentic or non-authentic from the first stage. This may be because in this discipline, students undergo formal information literacy instruction as part of the general education requirement module at the undergraduate level, in addition to the elective information literacy courses provided in their Master's programme before they start their project. The MCD participants confirmed that uncertainty about the specific information they needed in the first stage made them use the Internet as a general information source to meet their needs. In addition to the supervisor's recommendations, practising searching for information helps students develop their information skills capabilities regarding specific sources that can meet their information needs. As the information skills capabilities of the students in this stage are limited to searching for general information sources to understand the topic, their use of library-specific resources and services (e.g. library database and ILL services) will be less.

In PLD, the context of students' information needs is different from the previous cases (EED and MCD) as, due to the nature of their discipline, the situation will be different. Their information needs were shaped by their information culture, which demands both theoretical and professional legal information. In the first stage, they tended to need theoretical information in the form of legal books to undertake the necessary background reading and build their research proposals. Therefore, most of the participants were aware that the most important source they had to access and use was their college library. However, most of the participants confirmed that their college library's Arabic book collection is insufficient to meet their information needs. Therefore, they turned to alternative sources to fulfil their topic-specific needs to complete their research proposals. In this case, the inability of the college library collection to meet the students' information needs negatively affected the students' library use,

meaning that the less capable the library is of meeting the students' information needs, the less its resources and services will be used.

Regarding the information needs concept in this study, the situation in IHD is also different from the previous cases (EED, MCD and PLD). Due to the historical nature of this discipline, the students tended to mainly need books and archival materials housed in the university libraries. Therefore, the participants confirmed that they were aware about the importance of university libraries in meeting their needs at this stage. As the participants in this discipline were heavy users of the university libraries in terms of physically visiting them, most confirmed that they preferred to use the traditional library finding aids to locate what they needed more than the online tools. This may be because in this discipline, students need to conduct broad background reading to build their knowledge about their topics in the first stage. Therefore, they believed that the shelf-browsing technique or using the library card catalogue meant that they did not miss any items related to their research topic. However, some of the participants confirmed that they used the library card catalogue because they did not know how to use the online one. In this case, the less need to use the library's IT tools to find information resources, the more the library's conventional finding aids will be used.

Ultimately, in light of the facts identified and corresponding to the information needs element across the four cases, it can be stated that:

- The greater the students' lack of awareness of the importance of the library as an information source to meet their information needs, the fewer library resources and services will be used (EED).
- The less information skills capabilities the students develop, the less they will use the library resources and services (MCD).
- The less able the library is of meeting the students' information needs, the less they will depend on it as important information source (PLD).
- The less the need to use the library's IT tools to find the information resources, the more the library's conventional finding aid (the card catalogue) will be used (IHD).

In summary, the use of KU libraries in relation to information needs varied across the studied disciplines. EED students' lack of awareness of important sources to meet their information needs negatively affected the use of the library. In MCD, uncertainty about what specific information the students needed limited their information skills capabilities to searching general information sources. In IHD the low need to use library IT tools to carry out the

research in the first stage made the students depend on the library's traditional finding aids. Regarding PLD, the inability of the library's book collection to meet the students' information needs negatively affected its use.

### **Stage 2: The mid-stage (data collection, data analysis and writing up)**

Across all the studied cases, the students became more focused on their topics as they conducted the data analysis. Their information needs became more specific and narrower. However, due to the nature of the different disciplines, the context of their information needs differed. For example, in EED, the students' information awareness developed as their research projects progressed. Most EED participants confirmed that they became more certain about which important sources could be used for their research. Some confirmed that in addition to their use of the library database (IEEE), they became aware of the library's print journal collection. However, when they started writing up their research projects or theses, they became more aware of the library's book collection. In addition, their supervisor's recommendations about what sources were needed at each stage helped build their information awareness, and so their use of the library collection increased.

Most MCD participants confirmed that they became more able to identify which important sources to be used in relation to each task they performed as their research project progressed. Their information skills capabilities developed when they became more certain about what specific information they needed, in addition to their supervisor's recommendations. Some confirmed that they used Google Scholar for reliable information when they needed to implement their experiments, while others confirmed that they needed to use the library database (Science Direct) to search for up-to date information when completing their theses, meaning that the use of the library resources and services increased when the students developed more information skills regarding the specific sources to use in relation to each task they performed.

Most PLD participants confirmed that their professional information needs (e.g. verbal information from specialist in the field) developed as their research projects progressed. At this stage, they needed to rely more on the experience of professionals to support their arguments when interpreting their findings than on any other sources of information. As this professional information was not published or stored in the library collection, the library was not the main source to meet the students' needs. Accordingly, their use of the college library declined.

In IHD, as the students' research progressed, they became more familiar with the library collection. However, as the demands of the research process grew, the need for IT tools, such as the OPAC for locating information quickly, developed. Therefore, most of the participants at this stage confirmed that they used the library's online catalogue to search the library's print book or journal collections. They confirmed that they needed to use not only the OPAC but also the online bibliographic manuscripts index to locate primary sources. In this case, the students' IT tools needs developed as their research progressed.

Ultimately, in light of the facts identified and corresponding to the information needs element across the four cases, it can be stated that:

- The library resources and services will be used more as the students develop greater information awareness (EED).
- The use of the library resources and services will increase as the students develop greater information skills capabilities (MCD).
- The students will be less frequent library users as they develop more professional information needs (PLD).
- More online library services will be used as the students develop more IT tool needs (IHD).

In conclusion, there was a difference between the studied cases in the context of their information needs and their effect on the use of the library. In EED, as the students' information awareness developed throughout the research process, their use of the library increased in addition to their supervisor's recommendations. In MCD, the use of the library increased throughout the research process with the development of their information skills capabilities to carry out their research. However, in PLD, the development of the students' professional information needs throughout the research process negatively affected their use of the library, as this type of information is not provided by the library. In IHD, as the demand for research increased, the students' IT tool needs developed, which caused the increased use of the library's online services.

### **Stage 3: Reflections on the students' experiences**

Regarding the participants' reflections on the effects of their information needs on their library use, the analysis shows that most of the EED participants at this stage stated that their information awareness developed throughout the research stages, in addition to supervisor

recommendations. For example, some EED students confirmed that their supervisor was the one who directed them to use the leading database in their field (IEEE) for their research in the first stage. As their research progressed, other sources, such as the Internet (Google and Google Scholar), became more important when they wished to analyse their data because they needed to know how to use the software or how to design the model to manage the data and obtain results. When they wished to finalise their research projects, their awareness about the importance of the library's collection in completing their projects/theses developed.

The MCD participants reflected on the development of their information skills capabilities from using Google as a starting point to search for general information to understand their research topic and then moving to Google Scholar to search for journal articles. After that, their information skills capabilities improved, allowing them to use the leading database in their field (Science Direct), in addition to the recommendations of their supervisor and employing the library's book collection and services such as ILLs. In this case, the students' information skills capability developed as the demands of each stage developed in addition to their supervisor's recommendations.

The IHD participants reflected on their experiences of IT needs development as the demands of each stage increased. For example, some students reflected on their use of the online catalogue during the research stages and how their need to use its various features, such as the media index, developed as the demands of their research increased. Some reflected on how their need to use the online bibliographic manuscripts index developed as the demands of their research projects/theses grew. The PLD students provided no reflections on the effects of their information needs on the use of the library because of the inability of the library to fulfil their professional information needs.

Ultimately, in light of facts identified and corresponding to the information needs element across the four cases, it can be stated that:

- The library resources and services will be used more as the students develop greater information awareness during the research stages (EED).
- Library use will increase as the students improve their information skills capabilities (MCD).
- More online library services will be used as the students develop greater IT tool needs throughout the research stages (IHD).



To sum up, the nature of the discipline influenced the information needs in this study. The development of the graduate students' awareness about the importance of the library as an information source throughout the research stages positively affected the library use of EED students. The development of students' information skills capabilities in terms of identifying the specific sources to be used in relation to the demands of each task positively affected MCD students' use of the library. The increased need for IT tools to find the information resources in the library positively affected IHD students' use of the library's online services as their research demands increased. The development of professional information needs in PLD negatively affected PLD students' library use as their research progressed.

### **9.2.3 Study mode shaping the library role**

The analysis shows that the students' study mode (part-time or full-time) was a factor that influenced the role of KU libraries across all cases but was unaffected by the research process. Two elements emerged during the analyses as being influenced by the study mode as a cultural identity factor—availability and accessibility. For all four cases, these two elements are discussed as they relate to the supporting role of KU libraries. Table 9.3 summarises the differences between the disciplines relating to the study mode cultural identity factor.

**Table 9-3 Differences between the disciplines across cases in relation to the study mode cultural identity factor**

Cultural identity	Specific elements	Related issues	EED	MCD	IHD	PLD
<i>Study mode</i>	Availability	Students' availability	<b>Less available</b> Most are part-time students	<b>Available</b> All are full-time students	<b>Less available</b> Most are part-time students	<b>Less available</b> Most are part-time students
		Library hours	Library opening hours insufficient to fulfil students' research needs	Library opening hours insufficient to fulfil students' research needs	*	*
		Library resources and services availability	<b>IEEE</b> –No remote access  Interlibrary loan services available only in the daytime	<b>Unavailability</b> of remote access off campus  _____	<b>Unavailability</b> of remote access off campus  Photocopying services available only in the daytime	<b>Unavailability</b> of remote access off campus  Photocopying services available only in the daytime
	Accessibility	Access points	Remote access point off campus is provided	Remote access point off campus is not provided	Remote access point off campus is not provided	Remote access point off campus is not provided
		Library restrictions	Theses not allowed to be borrowed or photocopied	Theses not allowed to be borrowed or photocopied	Limited amount of photocopying of books	Limited amount of photocopying of books
		Foreign Language barrier	*	Limited English language skills affect the use of the library database	Lack of foreign language skills  Lack of translation services.	Poor language skills in English or French  Lack of a professional librarian in English language

\*No evidence has been provided

Similarities and differences across the studied cases regarding the study mode cultural identity factor are discussed in Sections 9.2.3.1 and 9.2.3.2.

### 9.2.3.1 Availability

Three issues related to the availability elements were identified across the studied cases. These are the availability of the students, the availability of library hours and the availability of library resources and services (Table 9.3). These three issues are discussed for all cases, as follows.

#### 9.2.3.1.1 Availability of students

The analysis shows that part-time students were less available on KU campus due to their job commitments, while full-time students were more available on campus. Some library services offered to the students were only available physically and in the daytime, such as the inter-library loans service and photocopying services. Only full-time students can benefit from these services, due to their availability on campus at this time, while part-time students would be unable to use these services due to their lack of availability. Accordingly, full-time students were able to access the university library physically and use its resources and services more than part-time students. This issue will be discussed across the studied cases as follows:

The majority<sup>5</sup> of EED participants (10 out of 12), PLD participants (9 out of 12) and IHD participants (8 out of 12) were part-time students. They confirmed that the main reason preventing them from using the library services was that they were not able to be on campus in the daytime. For instance, the lack of availability of EED participants prevented them from using the ILL service to request the information resources they need that are unavailable in the library collection. The majority of PLD and IHD participants confirmed that the availability of photocopying services during the daytime only meant that they were unable to benefit from this service. In this case, the unavailability of the students during the daytime negatively affected their library use.

All the MCD participants were full-time students as they are not allowed to register as part-time students in their Master's course. Almost all the participants indicated that they could access the library physically in the daytime and use its facilities, resources and services, such as the ILL services, printing and photocopying services. In this case, the availability of the students on campus during the daytime enhanced their ability to build a relationship with the library and use the services that are unavailable in the evenings. In this case, the availability of the students in the daytime positively affected their use of the library services.

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<sup>5</sup> Majority = 8 to 10 participants out of 12

In light of the facts identified and corresponding to the students' availability across the four cases, it can be stated that:

- The library services will be used less by the students as they are less available to be on campus (EED, PLD and IHD).
- The use of library resources and services will increase as the availability of the students to be on campus increases (MCD).

#### **9.2.3.1.2 Library hours**

The cross-case analysis revealed that the EED and MCD participants were dissatisfied with the library hours (8:00 am to 9:00 pm). Part-time students could not use the library resources and services during the daytime. In the evening, they had to attend lectures from 4:00 pm to 9:00 pm and unfortunately, the library was closed by the time their lectures ended. Therefore, they were unable to access and use the library resources and services. Some EED participants confirmed that what made them unable to use the library resources and services during the evening was their commitment to attending lectures. As the library was closed by the time their lectures ended, they used to access the library from their department. They recommended that the library should extend its hours so that they could use its facilities and benefit from its resources and services. Although the MCD participants were full-time students, some complained about the inconvenient library hours, particularly at the beginning of the academic year, on weekends and during the holy month (Ramadan). They complained about the differences between the library hours at the beginning of the academic year and the shorter hours (9:00 am to 2:00 pm) during the holy month, saying they were inadequate to fulfil their research needs. Full-time students were on campus even in the evenings, as they were busy in the labs working to complete their research. They perceived that the library's closing time was not convenient for them and recommended extending the library's hours.

The IHD and PLD participants did not provide any evidence of dissatisfaction with the library hours. This may be because they did not have lab work that took up their time, as their studies were mostly theoretically based. Therefore, full-time students had free time to physically access the library in the daytime, as all lectures at the graduate level took place from 4:00 pm to 9:00 pm. Part-time students could physically access the library in the evening and between lectures, which seems to have been convenient for them.

In light of facts identified and corresponding to the availability of library hours across the cases, it can be stated that:

- The library will be used more if the library hours are extended (EED, MCD).

#### **9.2.3.1.3 Availability of library resources and services**

Another issue related to the availability element that shapes the influence of the study mode on the role of the library is the availability of the library resources and services. The majority of PLD, IHD and EED participants confirmed that the unavailability of remote access services from home forced them to use other sources to meet their information needs. For example, in PLD, the unavailability of off-campus remote access to the library's online resources, such as the Kuwait Lawyers database, forced them to use their workplace libraries because most of the law participants' jobs were linked to their profession so the information resources they needed tended to be available at their workplaces. Some participants indicated that they used the Internet at their workplaces to meet their information needs. Similarly, in IHD, the unavailability of off-campus remote access to the library's online resources for some part-time participants who needed to use a historical, subject-specific database in a foreign language made them less able to benefit from this service. The library's online catalogue and manuscripts index were accessible remotely from off campus.

Most of the EED participants indicated that the unavailability of information regarding remote access to the IEEE database from home forced them to use the Internet, as it was available at their workplaces and easy to access. Some indicated that they used the free access to IEEE provided by their workplace libraries. It seems that the unavailability of the participants on campus during the daytime prevented them from visiting the library personally to request the access information that enables them to use the library service remotely from home, thus negatively affecting their library use.

Although all the MCD participants were available during the daytime and could access the library's online database on campus, accessing it remotely from home was impossible. In addition, the library's limited subscriptions to subject-specific databases (Science Direct) prevented them from accessing some full-text articles relating to their specific topics. Therefore, some of the participants confirmed that they used other available library databases, such as that at KISR, to obtain the articles they needed. In this case, the library's limited subscriptions to the leading databases in the field negatively affected the students' use of the library.

Therefore, it can be stated that:

- The use of the library resources and services will increase as more remote access services to online resources become available (EED, PLD, IHD and MCD).
- The use of online resources will be reduced when the library subscriptions to the leading databases in the field are limited (MCD).

### 9.2.3.2 Accessibility

Three issues related to accessibility were identified across the studied cases. These are access points, library resource restrictions and the foreign language barrier (Table 9.3) and are discussed below for all the studied cases.

#### 9.2.3.2.1 Access points

It was found that KU libraries provide access to their resources and services on campus and, to a far less extent, off campus. The availability of full-time students on campus enabled them to physically access the library and use its resources and services directly or remotely from their department, while the lack of remote access from home prevented part-time students from using the library and benefitting from its resources and services. As part-time students are unavailable on campus in the daytime, accessing the library remotely from home is very important. Most of the EED participants confirmed that they could not access the IEEE database remotely from home because they did not have the access information to use this service. Although this was provided by their college library, few of the participants used this information to access the database remotely from home, and their lack of availability made them unable to communicate with the library staff to request access, as the library staff were only available during the daytime. The PLD participants experienced the same problem. The IHD participants indicated that they could not access the subscription-based, subject-specific databases remotely from home, as this service is not provided by their college library, but the access point for the library catalogue and manuscripts index was available remotely.

The most interesting issue is that some of the MCD participants (full-time students) confirmed that they could access subject-specific databases (e.g. Science Direct) from the library or their department but not from the lab. It seems that some technical issues relating to access points in the lab prevented the students from using this service. Remote access to this database from home was also unavailable.

Therefore, we can say that:

- More library resources and services will be used by the students if more access points are provided on and off campus (EED, MCD, PLD and IHD).

### **9.2.3.2.2 Library restrictions**

The restrictions on some library services and resources limited their use by both part-time and full-time students. The analysis revealed that some restrictions existed on thesis and book collections, which limited their use by the graduate students across all the studied cases. For instance, EED participants indicated that because theses could not be borrowed or photocopied, they tried to find another way to obtain copies of their colleagues' theses from the departmental library, while some MCD participants tried to photocopy parts of theses that were not allowed to be photocopied using their iPads. The majority of the PLD and IHD participants confirmed that they also faced difficulty in photocopying books that could not be borrowed, as the library placed a restriction on the number of pages (50 pages) that could be copied.

In conclusion, it can be stated that:

- The more restrictions the library places on access to and the use of its services, the less its collection will be used by graduate students (EED, MCD, PLD and IHD).

### **9.2.3.2.3 The foreign language barrier**

The foreign language barrier is another issue that emerged in relation to accessibility across the studied cases. It was found that some graduate students faced language difficulties when interacting with foreign language resources. As most of the graduate students are native Arabic speakers, their limited English language skills acted as a barrier preventing them from accessing English language resources. For example, in MCD, although English is the main instruction language, some participants confirmed that they faced language difficulties when interacting with the library's subject-specific database to search for the information they needed, particularly in the first stage of their research. Therefore, they spent a long time finding suitable keywords in English that would enable them to obtain relevant results. Most PLD participants indicated that their lack of English language skills prevented them from accessing legal resources in English or even French, as the instruction language for their programme is Arabic and most were unskilled in any foreign language. In addition, the lack of a professional librarian with English language skills to help them access these resources meant that they were unable to use them.

Most IHD participants confirmed that their lack of knowledge of foreign languages prevented them from accessing foreign resources relating to the historical region they needed to study, as

their field (Islamic history) covers many Islamic regions where the mother language is not Arabic. Therefore, they emphasised that the college library should provide a translation service so they can access and use foreign language resources. However, in EED, no issue emerged relating to the foreign language barrier to using the library's online databases, possibly because the supportive role of the supervisor as an information source and information skills trainer meant that the students did not face any language difficulties.

In light of the facts identified and corresponding to the foreign language barrier issue across the four cases, it can be stated that:

- The library's foreign language resources will be used less when the students have limited foreign language skills (MCD, PLD and IHD).

In sum, the study mode culture influenced the role of KU libraries in supporting the students' research across all the studied cases. The lack of student availability, combined with the lack of library service availability, such as off-campus remote access, negatively affected the role of the library across all cases. Some issues related to the accessibility element emerged from the analysis—such as access points, library restrictions and the foreign language barrier— that also negatively affected the graduate students' library use.

#### **9.2.4 Students' experiences shaping library's role**

In the context of this research, the students' personal experiences reflect each student's perceptions of the library services provided and their feelings about the use of its resources and services. The analysis revealed that the performance of library services, communication experience, feelings and personal attitudes appeared to have an effect on the students' interaction with the library across the studied cases. These elements are discussed below for all cases in relation to KU libraries' supporting role. Table 9.4 summarises the differences between the disciplines relating to the cultural identity factor of students' personal experiences.



**Table 9-4 Differences between the disciplines across the cases in relation to the students' personal experiences cultural identity factor**

Cultural identity	Specific elements	EED	MCD	IHD	PLD
<i>Students' personal experiences</i>	Performance of library services	<ul style="list-style-type: none"> <li>• Subscription expiration to a leading database in their field</li> <li>• Long process of interlibrary loans service</li> </ul>	<ul style="list-style-type: none"> <li>• Limited subscriptions to subject-specific databases in the field</li> <li>• Long process of interlibrary loans service</li> </ul>	<ul style="list-style-type: none"> <li>• Difficult to find topic-specific books, such as monographs, particularly in Arabic</li> <li>• Long process of interlibrary loans service</li> </ul>	<ul style="list-style-type: none"> <li>• Lack of a specific legal book collection in the Arabic language</li> </ul>
	Library communication experience	*	Communication with the library staff helps to build a positive image of the library services	Communication with the library staff helps to build a positive image of the library services	*
	Feelings	Negative image of the library, lack of trust in its resources and services	*	*	Negative image about the library services from the first stage
	Personal attitudes	Positive attitude about the research-related collection from the very beginning	*	*	Positive attitude towards building their research-related collection from the very beginning

\*no evidence has been provided

The similarities and differences across the cases regarding the cultural identity factor of students' personal experiences are discussed in Sections 9.2.4.1 and 9.2.4.2 below.

### 9.2.4.1 Performance of library services

Most of the participants across the four studied cases complained about the performance of their college library (Table 9.4). According to them, the current performance of KU libraries is insufficient to meet their needs. For example, the majority of EED participants complained that the unacceptable subscription expiration to a leading database in their field (IEEE) forced them to rely heavily on the Internet or their supervisor's support. The majority of MCD participants complained about the limited subscriptions to the subject-specific databases in their field, which forced them to use the databases at other accessible professional libraries (e.g. KISR library) to fulfil their information needs.

In PLD, the lack of a specific legal book collection in Arabic at the college library forced the students to travel abroad to find needed resources. In addition to the use of another specialised library, they used their supervisor's personal collection or bought books from publishers or bookshops to fulfil their information needs. Most IHD participants confirmed that they found it difficult to find specific books relating to their specific topics, such as monographs, particularly in Arabic. They claimed that the library's book collections provided general information about their topics, but this was insufficient to fulfil their research needs. In addition, they complained about the insufficiency of the primary sources, such as the

manuscript collections at the Central Library. Therefore, they used other archival institutions, bought the books they needed from bookshops or used their supervisor's book collection to fulfil their needs.

Some EED, MCD and IHD participants complained about the lengthy ILL process. Some MCD participants confirmed that they preferred to buy documents online so that they could access them quickly, rather than wait a long time to receive them via the ILL service. Similarly, some EED participants confirmed that seeking their supervisor's support or even buying documents online was quicker than waiting to obtain them via the ILL service. The participants in these two disciplines were under time constraints as they were busy working in the lab; therefore, they tended to use the most readily available, easily accessible information to meet their needs.

IHD students needed to request primary sources, such as manuscripts, but found it took far too long for them to be delivered using the ILL service. They expressed their hope that this long waiting period would be reduced from months to several weeks. It seems that KU libraries' performance was limited to providing the graduate students with the information resources available in their collection. If the library is unable to fulfil the students' needs, they might search for alternative sources of information. In this case, the graduate students' library use will decrease as the functionality of its services declines.

Therefore, it can be stated that:

- The graduate students' library use will decrease as the performance of the libraries' services declines (EED, MCD, PLD and IHD).

#### **9.2.4.2 The library communication experience**

The students' communication with the library staff has been identified as one of the most important issues that helps shape the students' personal experiences of using KU libraries (Table 9.4). For example, in MCD, as all the students were full-time, the availability of the participants combined with the availability of the library staff during the daytime enabled the participants to physically visit the library and communicate with the librarian. Most of the participants acknowledged that their college library staff made great efforts to help when needed. They confirmed that the librarians provided one-to-one training sessions on how to use the library based on the students' requests. Some students confirmed that the library staff in charge of the photocopying services also made great efforts to complete the photocopying tasks on time. Moreover, the supervisor's recommendations helped to maintain the bridge between

the students and the library staff, which enhanced their communication experience. This experience led the participants to build a positive image of the library and enhanced their use of it throughout the research stages.

In IHD, only those who were full-time students provided evidence about their communication experiences with the library staff. Due to their availability in the daytime, they could communicate with the library staff more than part-time students. They confirmed that the staff of the Arts Library (the Women's Library) and the archival staff at Jaber Al-Ahmed Central Library were both very helpful. The students acknowledged that they provided help in locating materials that were difficult to find. In addition, the professional librarians in the archival department located in the Central Library were very helpful and able to answer any enquiries about how to locate primary sources, such as manuscripts. The ability of the library staff to provide help when needed led the students to build a positive attitude towards the library. Also, as history students were heavy users of the library physically, it enabled them to develop strong relationships with the library staff throughout the research stages. This experience helped to maintain a bridge between the students and the library and also enhanced their use of the library services. In both cases, the more positive the communication experience with the library, the more the library resources and services were used.

The EED and PLD participants did not provide any evidence of their communication experience with the library. This may be because the EED participants tended to prefer to use the library virtually rather than physically, as they were busy working in the lab and did not have time to access it. In addition, their unavailability on campus during the daytime did not match the availability of the library staff. Similarly, in PLD, most of the participants were part-time students who were unable to be on campus in the daytime to communicate with the professional librarians and build strong relationships with them, and the library staff were unavailable in the evenings. In addition, the shortage of Arabic legal books in the library might be one of the reasons they were reluctant to visit the library and communicate with the staff.

We can therefore state that:

- The library resources and services will be used more as the students develop a more positive image of the library through engaging in effective communication (MCD, IHD).

### 9.2.4.3 Personal feelings

The negative or positive feelings that the students developed in relation to the library services from the very beginning affected their library use (Table 9.4). The students' feelings regarding the ability of library services to meet their needs were identified as an important issue that shaped the students' personal experiences. For instance the EED participants confirmed that their negative feelings about the library were due to their negative experience with the library services from the first stage. The lack of availability of information services combined with the poor performance of the librarians led to their negative feelings. Similarly, the PLD participants confirmed that they developed a negative image of their college library services when they experienced its poor book collection (both a lack of information resources and poor organisation of the books on the shelves) at the initial stage. The negative image that the students developed during the earlier stages made them avoid using the library and seek alternative resources instead.

In the mid-stage, the image of the library in EED developed according to the increased demands of the research process, in addition to the supervisor's recommendations, which helped improve the negative image of the library. In PLD, the negative image built from the very beginning made the participants use the library services less, despite the increased demands of the research process. It seems that the supervisors in this discipline had the same negative image of the library's book collection as the students; hence the evidence provided by the participants that the supervisor played a role as an information provider via his/her personal collection in the mid-stage. In MCD and IHD, the participants did not exhibit any negative feelings about their college library services in respect of their personal experience.

In light of the facts identified and corresponding to the feelings element across the cases, it can be stated that:

- There will be greater use of the library services as the students develop more positive feelings about the library throughout the research stages (EED, PLD).

### 9.2.4.4 Personal attitudes

The graduates' positive or negative attitudes towards gathering the information needed in the earlier research stages affect their library use (Table 9.4). The analysis shows that participants in EED and PLD had positive attitudes towards collecting a broad range of research-related

information at the start. For example, most of EED participants confirmed that their personal attitudes towards preparing all the information resources needed would save them time and effort, as they would be occupied in the lab during the later stages. In addition, they needed to build their personal knowledge about their topics before commencing the implementation process.

All the PLD participants confirmed their positive attitudes towards collecting as many information resources as possible in the first stage to be used in the later stages. This meant that the information was handy and easy for them to access later. As they experienced a lack of information resources in their library from the first stage, they continued to compile their research-related collection from other resources. As the demand for information throughout the research stages developed, the law students' desire to build their research-related collections from other resources increased. However, in IHD, the participants, as historians, had a tendency to build their private collections—particularly primary sources—from the undergraduate level. In MCD, the students did not show any personal preference for building a research-related collection from the early stage to use in the later stages.

It can therefore be stated that:

- Library use will decrease in the later stages, as the students' positive attitude towards building their personal-research related collection increases in the earlier stages (EED, PLD).

In summary, the students' personal experiences regarding KU libraries had an influence on their information use patterns. The low level of library service performance across all the studied cases negatively affected the use of its resources and services. The lack of a specific Arabic book collection and primary sources, such as manuscripts, along with the limited library subscriptions and the terminated subscriptions to certain subject-specific databases negatively affected the use of library services. Moreover, the long process of requesting and obtaining unavailable documents through the ILL service reduced the use of KU library services. The communication experiences of MCD and IHD students with the library staff positively affected the use of KU libraries. The negative image that the PLD and EED students formed of their college libraries and their personal attitudes towards building their research-related collection from the very beginning negatively affected their library use.

## 9.2.5 Library’s information services shaping the library role

The study findings revealed that the information services provided by KU libraries had an influence on their supporting role but was unaffected by the students’ specific research stage. Training and support were identified as the most important elements that shaped the effect of the information services cultural identity factor on the use of KU libraries. This element is discussed across the studied cases in respect to KU libraries’ supporting role below. Table 9.5 summarises the differences between the disciplines in relation to the library information services cultural identity factor.

**Table 9-5 Differences between the disciplines across the cases in relation to library information services cultural identity factor**

Cultural identity	Specific elements	Related issues	EED	MCD	IHD	PLD
<i>Library information services</i>	Training and support	Promotion of services	Ineffective promotion of the services	Ineffective promotion of the services	Ineffective promotion of the services	Ineffective promotion of the services
		Self-training	Trial and error method	Library one-to-one session	Trial and error method	Trial and error method
		Supervisor support	Plays a significant role as information skills trainer	Does not act as an information skills trainer	Provides information skills training and translation support	Provides information skills training and translation support
		Module based training	*	Elective module integrating information skills training	Obligatory module integrating library skills training	*

\*No evidence has been provided

The similarities and differences across the cases regarding training and support-related issues are discussed next.

### 9.2.5.1 Training and support

As indicated previously (in Chapters 5–8), training and support reflect the demand for systematic, instructed training to learn how to use the library’s online services and to find out about the different types of information resources and services available. Despite the fact that KU libraries provide training sessions for their users on request, the analysis shows that KU libraries had not focused on graduate students as a special group by offering advanced sessions on how to use library’s online resources. Four issues related to the training and support element were identified across the cases: the promotion of the services; own self-training; supervisor support and module training (Table 9.5). These issues are discussed across all cases.

### 9.2.5.1.1 Promotion of services

Publicity is an issue that helps to shape the library's information services, although most of the participants in the four studied cases (EED, MCD, PLD and IHD) claimed they did not receive any type of promotion from their college libraries to attend a training session designed especially for them. The analysis shows there were similarities across the studied cases regarding KU libraries' promotional services (Table 9.5). Two full-time participants (one in PLD and one in MCD) confirmed that they had attended a training session provided by their college libraries on how to use the library's e-resources but reflected on the need for more advanced training programmes, as those sessions were inadequate to fulfil their specific needs. This means that training sessions to enhance the information skills of graduate students did exist in the academic libraries but that most of the students in the four studied cases were unaware of them. It seems that KU libraries' promotion programme did not reach all graduate students, particularly part-time students who were hard to reach due their lack of availability. In this case, the library's training programme will be used more by the graduate students as more promotional services are provided.

It can be stated that:

- The more the library publicises its services, the more the students will take advantage of its training sessions (EED, MCD, PLD and IHD).

### 9.2.5.1.2 Self-Training

The students' ability to search for and use information based on their own attempts to fulfil their needs reflects their personal efforts. The analysis revealed that the majority of the EED, PLD and IHD participants depended on their personal efforts to improve their information skills (Table 9.5) using trial and error. This method was used by the graduate students across all research stages equally. Although KU libraries provided one-to-one training sessions at the request of the students, none of the participants in these disciplines indicated that they had used this service to improve their information skills. This may be because most of the participants were part-time students who were unavailable on campus in the daytime to communicate with professional librarians who were only available in the mornings. As most of the EED, PLD and IHD participants confirmed that they did not receive any systematic training provided by the library to enhance their information skills, the library appeared to have no influence on their information skills training. In this case, what most shaped the training element was personal effort.

In MCD, all the participants were full-time students and confirmed that they could request one-to-one sessions to improve their information skills when needed. However, a few confirmed that they depended on their own efforts to improve their information skills throughout the research stages. In this case, the availability of the students in the daytime enabled them to use the library's training services to improve their information skills, as needed.

Therefore we can say that:

- The less available the training services provided by the library, the more the students depend on their personal efforts to improve their information skills (EED, PLD and IHD).
- The more library training sessions the students receive, the less they will depend on self-training to improve their information skills (MCD).

#### **9.2.5.1.3 Supervisor support**

Across all the studied cases and throughout the research stages, the training role of the supervisor appeared to have an influence on the role of the library (Table 9.5). For example, the majority of the EED participants confirmed that their supervisor played a major role in training them to be able to start their search in order to decide on their topics. Because they trusted his/her knowledge and believed that no one can provide more support in their field, he/she took on the role of the library and provided training support to improve both the information and study skills of the students.

The majority of the PLD participants stated that their supervisor played a role in training them on how to search for information from the very beginning and, after they had selected their topic, he/she directed them to where they could find the information and how to search for it. In addition, he/she provided training support to improve the students' information skills, when needed. The majority of IHD participants confirmed that their supervisor also played a role in guiding them in where to find the information resources relevant to their topic and in introducing them to other resources, such as specialists in their field. In addition, he/she provided training or even translation support when the students were unable to understand the information resources in foreign languages that would enable them to complete their projects. In this case, the support role played by the supervisor as information skills trainer affected the role of KU libraries negatively.



The majority of MCD participants indicated that their supervisor played a complementary role in training them to search for information relevant to their research topic. This is because the supervisor encouraged them to attend an elective module that integrated a training session as part of the course. Therefore, their information skills developed throughout the course and they practised them throughout the research stages. However, the participants confirmed that they sought their supervisor's help when they faced difficulties in finding information sources but did not seek training from him/her.

Ultimately, it can be stated that:

- The role of the library decreases as the role of the supervisor as an information skills trainer increases (EED, PLD and IHD).
- The role of the library increases as the role played by the supervisor as an information skills trainer decreases (MCD).

#### **9.2.5.1.4 Module-based training**

The analysis revealed that the Master's programmes in MCD and IHD provide modules that integrate training sessions as part of the course. These modules familiarise the students with the library services and provide training (Table 9.5). For example, most of the MCD participants confirmed that their supervisors encouraged them to register for an elective module that integrated a training session before they commenced their research projects to help to improve their information skills. The participants who attended this module confirmed that they became familiar with the services provided by the library through this course rather than through the library itself. The IHD participants confirmed that before they started their research, they were all required to complete a compulsory module that integrated library skills, which familiarised them with the library services and trained them on how to use specific resources, such as archival materials (e.g. manuscripts). Most confirmed that they had received systematic training on how to physically locate information in the library using the card catalogue, printed manuscript indexes, etc. in this course. It seems that the History Department prepared the students to use the library's traditional services more than the online ones, based on the discipline requirements and because most of the Arabic resources required were available in the print collection. In both cases, integrating training sessions as part of the course positively affected library use. The EED and PLD participants provided no confirmation about any systematic library training as part of their Master's course.

In light of the facts identified and corresponding to the module-based training issue across the cases, it can be stated that:

- There will be greater use of the library resources and services as the students receive more systematic training through their Master's course modules (MCD and PLD).

In summary, the information services provided by KU affected the role of the library in supporting the graduate students' research. Across all the studied cases, the inadequate publicity of the service provided by KU libraries negatively affected its training support role. In addition, the limited availability of its training services made the graduate students more dependent on their self-training methods. The support role of the supervisor as an information skills trainer also affected the role of the library negatively, but the systematic training the MCD and IHD students received through their Master's course affected their library use positively.

#### **9.2.6 External information sources shaping the library role**

An external source, as defined previously (in Chapters 5–8) is a source that exists outside KU libraries. Across the studied cases, the external sources cultural identity factor appears to have had a considerable influence on the support role of KU libraries but was unaffected by the research process. The supervisor, other accessible libraries, specialists in the field and the Google search engine are four issues that were identified as shaping the influence of external sources on the use of KU libraries. Below, these issues are discussed across all the cases in relation to their influence on the role of KU libraries. Table 9.6 summarises the differences between the disciplines related to the external sources cultural identity factor.

**Table 9-6 Differences between disciplines across the cases in relation to external information sources cultural identity factor**

Cultural identity	Related issues	EED	MCD	IHD	PLD
<i>External information sources</i>	Non-university libraries	<ul style="list-style-type: none"> <li>• Workplace library</li> </ul>	<ul style="list-style-type: none"> <li>• Specialised library</li> </ul>	<ul style="list-style-type: none"> <li>• Public libraries</li> <li>• National libraries</li> <li>• Commercial libraries</li> <li>• Bookshops</li> <li>• Other archival institutions</li> </ul>	<ul style="list-style-type: none"> <li>• Workplace library</li> <li>• Courts library</li> <li>• Legislative body libraries</li> </ul>
	The supervisor	<ul style="list-style-type: none"> <li>• <b>Main source of knowledge</b> experience</li> <li>• <b>As</b> information provider</li> </ul>	<ul style="list-style-type: none"> <li>• Provided support when the library failed to meet the students' needs</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Source for</b> advice concerning where to find information</li> <li>• <b>Source of information</b> through their personal collections</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Source of</b> direction for the possible information channels</li> <li>• <b>Source of information</b> through their personal collections</li> </ul>
	Specialists in the field	<ul style="list-style-type: none"> <li>• Other professors</li> <li>• Faculty members</li> </ul>	<ul style="list-style-type: none"> <li>• Other professors</li> <li>• Lab technicians</li> </ul>	<ul style="list-style-type: none"> <li>• Subject experts</li> </ul>	<ul style="list-style-type: none"> <li>• Legal advisors</li> <li>• Judges</li> </ul>
	Google search engine	<ul style="list-style-type: none"> <li>• <b>Search for</b> software usage steps</li> <li>• Device manuals</li> <li>• <b>Access</b> university websites</li> <li>• lab reports</li> </ul>	*	<ul style="list-style-type: none"> <li>• <b>Search for</b> books, journal articles, maps, images and online Arabic thesaurus</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Access</b> official websites not accessible through the library</li> </ul>

\*No evidence has been provided

The similarities and differences across the cases regarding the external source issues are discussed below.

### 9.2.6.1 Non-university libraries

It was found that the students can gather information using all the possible libraries they can access outside the university. This was confirmed across all the studied cases (Table 9.6). For example, most PLD participants stated that they accessed many professional libraries outside the university to meet their topic-specific needs. Most confirmed that they used their workplace library because its collection was richer than that of their college library. They confirmed that most of the information, both published and unpublished, was available in their workplace due to the link between their specific topic and their profession. Some used the court library to obtain the latest primary sources (e.g. legislation and decisions) as they claimed that what was provided by the library database (e.g. the Kuwait Lawyers database) was not recent. Others used legislative body libraries when their college library could not fulfil their professional information needs. In IHD, due the interdisciplinary nature of the history field, the students needed to gather information from a wide range of libraries. The majority of the IHD participants confirmed that they used different libraries outside KU, such as public libraries,

national libraries, commercial libraries, bookshops and other archival institutions, to fulfil their topic-specific needs. In EED, although the participants were heavy users of the Internet, a few stated that they used their workplace library database because they had free, easy access to the all the important databases in their field. In this case, the use of KU libraries by the graduate students will decrease as more non-university libraries become accessible.

Less than half the MCD participants confirmed that they used other specialised library databases, such as that at KISR, because of the library's limited subscriptions to the leading database in their field (Science Direct). Therefore, they used other specialised library databases when they could not access the full-text journal articles that they needed. In this case, the lower the accessibility provided by the library database to its resources, the more dependent the students were on specialised libraries' databases to meet their information needs.

Therefore, it can be stated that:

- The use of library resources and services will decline as the students become more dependent on other accessible libraries to meet their needs (EED, IHD, PLD and MCD).

### **9.2.6.2 The supervisor**

Supervisor support of students in their research appeared to be dominant throughout the research stages, with the supervisor acting as an external information provider for the students (Table 9.6). For example, most EED participants confirmed that their supervisor was the first option as a source of information before searching the library. They stated that he/she was the most knowledgeable person for providing support in their subject area. Therefore, they depended on him/her to supply them with the information resources relevant to their research topic. In IHD, because historical primary sources are difficult to track down, the supervisor was the most common source for valuable advice about where to find information resources. A number of the participants in this discipline confirmed that their supervisor provided them with information resources related to their specific topic from his/her personal collection when the library failed to meet their information needs.

In PLD, the supervisor was the second option after searching the library. For example, most of the PLD participants confirmed that they sought information from their supervisor's personal collection when their college library failed to meet their topic-specific needs and that the supervisor directed the students to other possible channels of information that could be used to fulfil their professional needs. In this case, the supervisor took on the role of the library and

acted as the external source for the students. Consequently, library use will decrease when the library fails to meet the students' information needs, thus giving the supervisor the opportunity to act as an external information provider and supply the students with information resources from his/her personal collection.

In MCD, although the supervisor encouraged the students to use the library resources and services, when the students failed to find the information they needed in the library, they sought his/her support as an external source. A few of the participants confirmed that their supervisor provided them with textbooks to complete their discussion while a few others confirmed that their supervisors provided them with copies of original articles when the library failed to subscribe to the journal database related to their specific topic. In this case, the less available the supervisor as an external information source, the more the library will be used by the students to support their research.

It can therefore be stated that:

- The more the supervisor acts as an external information source to meet the students' information needs, the less the students will use the library's resources and services (EED, IHD).
- The use of the library will decline when it fails to meet the students' topic-specific needs, thus encouraging the supervisor to play a role as an external information provider (PLD).
- The less dependent the students on the supervisor as an external source, the more the students will depend on the library resources and services to meet their information needs (MCD).

### **9.2.6.3 Specialists in the field**

It has been found that the graduate students at KU not only seek their supervisors' support for their research but also seek advice, professional experience or information resources from experts in their field across all the studied cases (Table 9.6). For example, some MCD students emphasised that to ensure that their experiment could be applied in the Kuwait environment and to verify what materials they should use for this purpose, they sought advice from professionals in the field, such as senior lab technicians. Others confirmed that they sought recommendations from professors in their subject areas about the originality of their topics,

while yet others sought information resources from professors in their field regarding their specific topic.

Some IHD participants confirmed that they personally contacted a subject expert to seek advice about which information resources they had to read when they needed to make a decision about their sub-topic. Some confirmed that they sought information resources from his personal collection to build their knowledge about their research topic. As the expert in their field is more specialised in their subject area, their supervisor directed them to seek his/her opinion and advice. The most interesting thing is that when this expert was unavailable locally, some IHD students confirmed that they were advised to travel to where this expert was located to seek his/her advice and support as an information source.

In PLD, due to their professional needs, the students sought specialist commentary from a legal advisor or judge who had experience in their field. In order to understand the different aspects of the application of the law, they needed his/her verbal or written comments about the law. Most of the participants in this discipline confirmed that their supervisor encouraged them to use this type of information source to support the argument of their research. Some EED participants confirmed that they sought experts in the field as information sources, such as other faculty members or professors. In this case, the use of the library resources and services declined as the students' needs for specific information from specialists in the field increased.

Therefore, we can say that:

- There will be less use of library resources and services as the students become more dependent on specialists in the field as external sources to meet their information needs (EED, IHD, PLD and MCD).

#### **9.2.6.4 The Google search engine**

The analysis shows that these students accessed the Internet to use its search tools, such as Google, either from their workplace or from home. Most of the EED, PLD and IHD participants confirmed this (Table 9.6), possibly because the majority of them were part-time students with less access to the Internet services provided by the library on campus and so they accessed it from outside instead. Therefore, it can be considered an external source for the purpose of this study. The majority of EED participants confirmed that they used the Internet from home or their workplace, as it was available and easy to access. They confirmed that they needed to use Internet tools, such as the Google search engine, to search for software instructions, images,

standards and device manuals or to access university websites to search for models of lab reports, in addition to searching for journal articles using Google Scholar.

Some of the PLD participants confirmed that they need to use Google to search for updated provisions and laws by accessing official websites that were inaccessible via the library and paying a subscription for their personal use at home. Moreover, some of the participants confirmed that they used Google from their workplace to search for legal journal articles written in Arabic that were available on the Internet for free. Most IHD participants stated that they used Google to search for images, maps and Islamic history e-books available for free on the Internet, in addition to journal articles in Arabic and an online Arabic thesaurus. In this case, the use of the KU libraries' online services decreases as the use of Google outside the university libraries increases.

There was no evidence provided by the MCD participants that they used Google outside the university library. This may be because all the MCD participants were full-time students who were available on campus in the daytime and so could access the library and use its facilities and services.

Ultimately, it can be stated that:

- As part-time students become more dependent on Google as an external source to meet their information needs, there will be less use of the library resources and services (EED, IHD and PLD).

To sum up, the information sources available outside KU affected the role of the library in supporting the graduate students' research. The individual efforts of the supervisor as an information provider without any coordination with the library affected the role of the libraries negatively. Moreover, the need for specialists' advice and experience in the same field, using the Google search engine outside the library and the accessibility of other libraries also negatively affected the support role of KU libraries.

### **9.2.7 Financial adequacy shaping the library's role**

Across the studied cases, financial adequacy was identified as a significant cultural identity factor that shaped the role of the library. Capability was the only element identified that shaped financial adequacy's cultural identity. According to the findings of this study, financial adequacy appeared to have no influence on the research process, but it did influence the

students' interactions with the library across all cases. It appears that there was a similarity in the influence of this element on library use across the studied cases. Table 9.7 summarises the similarities between the disciplines related to the financial adequacy cultural identity factor.

**Table 9-7 Similarities between the disciplines across the cases, in relation to financial adequacy cultural identity factor**

Cultural identity	Specific elements	EED	MCD	IHD	PLD
<i>Financial adequacy</i>	Capability	<ul style="list-style-type: none"> <li>• Pay for a subscription to other databases</li> <li>• Buy journal articles online from the provider</li> </ul>	<ul style="list-style-type: none"> <li>• Pay for a subscription to other databases</li> <li>• Buy topic-specific books</li> </ul>	<p>_____</p> <ul style="list-style-type: none"> <li>• Buy history monographs to include them in their personal collection</li> </ul>	<ul style="list-style-type: none"> <li>• Pay for a subscription to local databases to access from home</li> <li>• Buy Arabic legal books to build their own research collection</li> </ul>

### 9.2.7.1 Capability

Across all cases, the participants confirmed that they tended to buy their information resources when the library was unable to meet their topic-specific information needs, and because they had the funds to pay for them. The majority of the participants across the studied cases admitted to purchasing information resources themselves when the library was unable to meet their information needs (Table 9.7). For instance, some EED participants confirmed that they subscribed to a database to which the library had ended its subscription. According to the findings of this case study, the Engineering Library appeared to have invalid or cancelled subscriptions to certain subject-specific databases. As the participants had the required funds to pay for the information resource needed, they did not waste time waiting for the library to meet their information needs. Similarly, some of the MCD participants confirmed that they paid for a subscription to other databases that were not provided by their library because of the excessive amount of time involved in waiting for the requests from the ILL service. Some PLD participants confirmed that they subscribed to local subject-specific databases provided by the library to access them from home.

Most of the IHD and PLD participants indicated that the lack of topic-specific information resources provided by their college library in the form of books, particularly in Arabic, forced them to buy their own research-related resources. Both IHD and PLD participants stated they travelled to other countries to buy the books they needed, as they were building their own private collections. Some MCD participants stated they bought some of their topic-specific



books because those provided by the library were out of date. EED participants stated that they bought journal articles online from the provider when they were unable to access these in full-text format. In this case, the ability of the students to buy the information resources required negatively affected the role of KU libraries across the studied cases.

Ultimately, according to the above discussion and with respect to the financial adequacy culture, it can be stated that:

- The role of the library decreases as students' financial capabilities increase (EED, MCD, PLD and IHD).

In conclusion, the students' ability to buy the information resources needed affected the role of the library in supporting the graduate students' research. Financial adequacy was a strong factor influencing the role of KU libraries. Across all cases, the more capable the students were of buying the information resources they needed for their research, the less they used the library resources and services. Table 9.10 summarises the effects of cultural identity factors on the role of the library.

**Table 9-8 Cultural identity factors and their effects on the role of the library in supporting research across the cases**

<b>Cultural identity</b>	<b>Description</b>	<b>Effects of the cultural identity factors on the role of the library across the cases</b>
<i>The culture of the discipline</i>	Each discipline has its own characteristics; nature and needs that influence the methods students use to select their research topics. The culture of the discipline will also affect the students' use and need of information resources such as the library.	<ul style="list-style-type: none"> <li>• The library will be used more by the students when selecting their topics, as few other information sources are available beyond their supervisor (IHD, MCD and PLD).</li> <li>• The library will be used less to build the proposal when there are more alternative information sources available, such as the supervisor, professional libraries, personal collections, etc. (EED, PLD and IHD).</li> <li>• There will be more library use when there exists a greater demand to complete research projects during the mid-stage (EED, IHD and MCD).</li> </ul>
<i>Information needs</i>	The term 'information needs' refer to students need to use specific sources of information to complete their research.	<ul style="list-style-type: none"> <li>• Different influence of this factor indicated in this study according to the differences in the information requirements for each discipline.</li> </ul>
<i>Study mode</i>	Students attend the university either part-time or full-time. Students' study mode will influence their availability and ability to interact with and access library services.	<ul style="list-style-type: none"> <li>• The library services will be used less by the students as they are less available themselves on the university campus (EED, PLD and IHD).</li> <li>• The use of the library resources and services will increase as more remote access to online resources become available (EED, PLD, IHD and MCD).</li> <li>• More library resources and services will be used by the students if more remote access points are provided (EED, MCD, PLD and IHD).</li> <li>• The more restrictions the library places on the access to and use of its services, the less its collection will be used by graduate students (EED, MCD, PLD and IHD).</li> <li>• The library's foreign language resources will be used less when the students' skills in foreign languages are lower (MCD, PLD and IHD).</li> </ul>

<b><i>Students' personal experiences of the library</i></b>	The library provides several sets of services equally for its users, but each student has his/her own experience with the library. The students' experiences with the library services will influence the level of their interaction with and use of the library.	<ul style="list-style-type: none"> <li>• The graduate students' library use will decline as the performance of the libraries' services decreases (EED, MCD, PLD and IHD).</li> </ul>
<b><i>Library information services</i></b>	The library provides set of services to support students' research, such as EIRs. Educating the students on how to use these services and marketing the services will influence their level of interaction with and use of the library.	<ul style="list-style-type: none"> <li>• The more publicity for its services the library offers, the more the students will take advantage of its training sessions (EED, MCD, PLD and IHD).</li> <li>• The less available the training services provided by the library, the more the students depend on their personal efforts to improve their information skills (EED, PLD and IHD).</li> <li>• The role of the library decreases as the role of the supervisor as an information skills trainer increases (EED, PLD and IHD).</li> </ul>
<b><i>External information sources</i></b>	External information sources are the sources a student uses outside the university library to satisfy his/her information needs. These sources vary, and can include the supervisor, professionals in the field, Google, etc.	<ul style="list-style-type: none"> <li>• The use of library resources and services will decline as the students become more dependent on other accessible libraries to meet their needs (EED, IHD, PLD and MCD).</li> <li>• There will be less use of library resources and services as the students become more dependent on specialists in the field as external sources to meet their information needs. (EED, IHD, PLD and MCD).</li> <li>• As part-time students become more dependent on Google as an external source to meet their information needs, there will be less use of the library resources and services. (EED, IHD and PLD).</li> </ul>
<b><i>Financial adequacy</i></b>	This cultural identity factor reflects the students' financial capability to purchase information resources that they cannot access via the library.	<ul style="list-style-type: none"> <li>• The role of the library decreases as students' financial capabilities increase (EED, MCD, PLD and IHD).</li> </ul>

The following section discusses unique disciplinary characteristics that emerged from the analysed data across the four studied cases.

### **9.3 Unique disciplinary characteristics shaping the library's role**

Across all cases, some factors emerged from the analysed data that might have influenced the role of the library negatively or positively, such as the role of the supervisor, information literacy education and students' travelling behaviour. These factors are discussed in relation to KU libraries' role in supporting graduate students' research.

#### **9.3.1 The role of the supervisor**

Regarding the cultural context of EED, the role played by the supervisor as information provider and information skills trainer in this discipline could be a significant factor in shaping the students' interaction with the library's resources and services. EED participants confirmed that the supervisor provided them with the necessary support from the very beginning, starting with selecting the topic and supplying them with the required information resources to training them on how to search for information. As the supervisor was available to fulfil the students' information needs, they did not need to interact with the library to carry out their research, which negatively affected their use of the library. However the recommendation of the supervisor to use the library in the later stages may positively affect the role of the library. In the other three disciplines, the dominance of the supportive role of the supervisor over the role of the library did not occur, which made this issue a unique characteristic of this discipline. MCD, IHD and PLD participants confirmed that the main role played by the supervisor in their discipline is as a source of guidance rather than an information supplier. However, some PLD and MCD participants stated that their supervisor provided them with information resources from his/her personal collection when the library failed to meet their needs or trained them on how to use the library's foreign language databases, such as in PLD.

#### **9.3.2 Information literacy education**

In MCD, the graduate students appeared to be able to conduct independent searches to and access and retrieve information without assistance from the supervisor from the very beginning. This may be because participants in this discipline have had some formal information literacy education at the undergraduate level and continue to improve their information skills through elective modules at the graduate level. MCD participants reflect an understanding of the range of information resources provided by the library and an ability to evaluate the information they

needed. The information skills capabilities of the participants in this discipline positively affect their use of the library, together with the recommendations of the supervisor. Some of the MCD participants confirmed that because they are full-time students, they have a chance to attend the library's one-to-one training sessions on request and communicate with the library staff to improve their information skills, which also positively affects their interaction with the library services. However, no evidence was provided by the EED and PLD participants that they undergo this kind of formal education from the undergraduate to graduate levels to develop their information skills. The IHD participants provided evidence that they have a compulsory module to develop their library skills only at the graduate level, which has a positive effect on their use of the library's physical collection.

### **9.3.3 Students' travelling behaviour**

Travelling to the source was identified in the data as one of the ways the graduate students obtain information in IHD and PLD. Most of the IHD participants confirmed that they were advised by their supervisor to travel abroad either to acquire information related to their specific topic (e.g. monographs) or to seek advice from specialists in their subject area. The participants in this discipline indicated that the local lack of topic-specific Arabic books encouraged them to travel outside the country to meet their needs. Similarly, PLD students travelled abroad to acquire information to complete their research projects. This may be because Arabic books tend to be available in print format and cannot be delivered easily to students in their home country. The travelling behaviour of IHD and PLD students may negatively affect their interaction with the library resources and services. In addition, some of the PLD students confirmed that they have to travel to the court to obtain recently issued primary sources, such as legislation and decisions. Although the library provides students with those resources via a local database called Kuwait Lawyers, the students did not depend on this to acquire up-to-date information. This affected their interaction with the library negatively. However, this kind of behaviour was not observed in the EED and MCD disciplines. This may be because the demand for e-resources, particularly in English, in those disciplines is high, and those resources can be delivered easily to students' desktops without the need to travel to the source.

In conclusion, across the studied cases, the support role of the supervisor in EED was one of the important factors that affected graduate students' library use negatively, while the information literacy education provided for IHD graduate students and for both MCD undergraduate and graduate students gave the students confidence to interact positively with

the library resources and services. The travelling behaviour of the graduate students in IHD and PLD was another factor that might negatively affect the role of KU libraries.

The following section will discuss the differences between the cultural contexts of the intellectual fields in the studied cases and how they have affected the information use and behaviour of the graduate students across the cases.

## **9.4 Field differences in shaping graduate students' information use and behaviour**

In this section, based on a comparative domain analytical approach, the two concepts comprising Whitley's theory ('mutual dependence' and 'task uncertainty') are employed (see Chapter 2, Section 2.6.2.1) to continue analysing the data to develop an understanding of the differences between the cultural contexts of the intellectual fields across the cases and how these shaped the information use and information behaviour of graduate students. The relative degree of 'mutual dependence'<sup>6</sup> and 'task uncertainty'<sup>7</sup> characterised the cultural identity of each case study at the field level. Based on what was discovered in the interview data, it was found that there is a difference in the degree of 'mutual dependence' and 'task uncertainty' across the studied cases. For example, in EED the degree of 'mutual dependence' is high and is accompanied by a low degree of 'task uncertainty' (see Chapter 5, Section 5.5.1). In MCD, the degree of 'mutual dependence' is moderate, coupled with a moderate degree of 'task uncertainty' compared to EED (see Chapter 6, Section 6.5.1). However, in IHD, the degree of 'mutual dependence' is low, coupled with a high degree of 'task uncertainty' (see Chapter 7, Section 7.5.1). PLD is categorised as having a moderate degree of 'mutual dependence' and 'task uncertainty' compared to IHD and EED (see Chapter 8, Section 8.5.1). Whitley (2000) argues that the combination of possible variations in the degree of 'mutual dependence' and 'task uncertainty' generates seven major types of disciplines or sub-disciplines. Of particular relevance to the four disciplines being analysed in this study are what Whitley describes as 'conceptually integrated bureaucracies' (electrical engineering), 'professional adhocracies' (microbiology), 'fragmented adhocracies' (Islamic history) and 'partitioned bureaucracies' (public law). Table 9.9 below illustrates how the culture of these disciplines is classified based

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<sup>6</sup> The degree of mutual dependence between researchers in making competent and significant contributions to science (Whitley, 2000, p.85)

<sup>7</sup> The degree of task uncertainty in producing and evaluating knowledge claims (Whitley, 2000, p.85)

on Whitley’s two interrelated concepts and their related sub-categories, coupled with each discipline type.

**Table 9-9 Differences in the cultural context and types of discipline of the studied cases based on Whitley’s theory two concepts and its related sub-categories (as outlined in Chapter 5, Section 5.5.1; Chapter 6, Section 6.5.1; Chapter 7, Section 7.5.1 and Chapter 8, Section 8.5.1)**

Studied disciplines	Cultural characteristics				Types of disciplines
	Mutual dependence		Task uncertainty		
	Strategic dependence <sup>8</sup>	Functional dependence <sup>9</sup>	Strategic uncertainty <sup>10</sup>	Technical uncertainty <sup>11</sup>	
<b>EED</b>	H	H	L	L	conceptually integrated bureaucracies
<b>MCD</b>	L	H	H	L	professional adhocracies
<b>IHD</b>	L	L	H	H	fragmented adhocracies
<b>PLD</b>	H	L	L	H	partitioned bureaucracies

\*L=Low and H=High, \*L+H or H+L=Moderate

Because ‘mutual dependence’ and ‘task uncertainty’ are relative concepts, they cannot be measured in absolute terms. Therefore, the studied cases are categorised in relation to one another based on the presence of qualitative indicators related to culture of the discipline, such as a hierarchy of the problems, the establishment of standardised research techniques and the degree of consensus over methods and integrative collaborative work. To use Whitley’s terms (2000), Tables 9.10 and 9.11 map the studied cases into Whitley’s four-cell matrix of functional and strategic ‘mutual dependence’ and technical and strategic ‘task uncertainty’.

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<sup>8</sup> ‘The extent to which researchers have to persuade colleagues of the significance and importance of their problems and approaches’

<sup>9</sup> Functional dependence between members of a field means ‘the extent to which researchers have to use the specific results, ideas and procedures of fellow specialists in order to construct knowledge claims recognised by their peers’ (Whitley, 2000 p.88)

<sup>10</sup> ‘Uncertainty about intellectual priorities, the significance of research topics and preferred way of tackling them’ ( Whitley, 2000 p.123)

<sup>11</sup> ‘The extent to which work techniques are well understood and produce reliable results’ (Whitley, 2000 p.121)

**Table9-10 Relative degree of mutual dependence across the studied cases related to the cultural context at the field level of each case study**

Strategic task uncertainty	Technical task uncertainty	
	Low	High
<b>Low</b>	<p>Considerable predictability, stability and visibility of task outcomes. Implications of results easy to draw and relatively uncontroversial. Problems and goals fairly clearly ordered, restricted and stable.</p> <p><i>Case 1:Electrical engineering</i> (Chapter 5, Section 5.5.1)</p>	<p>Limited technical control of empirical phenomenon, results unstable and difficult to interpret. Implications of task outcomes subject to alternative views and difficult to coordinate. Problems and goals restricted, stable and tightly structured.</p> <p><i>Case 4: Public law</i> (Chapter 8, Section 8.5.1)</p>
<b>High</b>	<p>As above, but the problems and goals were varied, unstable and not clearly ordered.</p> <p><i>Case 2: Microbiology</i> (Chapter 6, Section 6.5.1)</p>	<p>As above, but the problems and goals were varied, unstable and conflicting.</p> <p><i>Case 3: Islamic history</i> (Chapter 7, Section 7.5.1)</p>

**Table 9-11 Relative degree of task uncertainty across the studied cases related to the cultural context at the field level of each case study**

Strategic mutual dependence	Functional mutual dependence	
	Low	High
<b>Low</b>	<p>Weakly bounded groups pursuing a variety of goals with a variety of procedures. Little coordination of results or problems. Low extent of division of labour across research sites.</p> <p><i>Case 3: Islamic history</i> (Chapter 7, Section 7.5.1)</p>	<p>Specialist group pursuing differentiated goals with specific, standardised procedures. Considerable coordination of results and specialised topics, but little overall concern with hierarchy of goals.</p> <p><i>Case 2:Microbiology</i> (Chapter 6 , Section 6.5.1)</p>
<b>High</b>	<p>Strongly bounded research school pursuing distinct goals with separate procedures. High degree of coordination within schools, but little between them. Strong competition for domination of field.</p> <p><i>Case 4: Public law</i> (Chapter 8, Section 8.5.1)</p>	<p>As above, but strong hierarchy of specialist goals. Competition over centrality of subfields to disciplines.</p> <p><i>Case 1:Electrical engineering</i> (Chapter 5, Section 5.5.1)</p>



### 9.4.1 The fields' cultural identity differences

In EED (high 'mutual dependence' and low 'task uncertainty'), the intellectual priorities and problems tend to be visible and strongly hierarchically ordered (see Chapter 5, Section 5.5.1). Participants in this field reported that they have a good understanding from their prior education and training regarding the position of their research in relation to the rest of the field and how they can make a contribution to it. Therefore, they do not need to choose unrestricted topics and assess where their research fits within the specific field and across the discipline. In this field, the high degree of 'strategic dependency' makes the co-ordination and control transcend the technical level of incorporating specialist contributions to a common goals; it comprises the co-ordination of research projects in terms of specific goals and interests. Therefore, graduate students in this field are more oriented towards their specialist colleagues, such as their supervisor, to achieve collective goals, as research tended to be conducted in a group. The high degree of standardisation of technical procedures and results in this field is likely to be associated with low 'technical uncertainty', which encourages centralised control over the research process and key resources. Overall, a high degree of 'mutual dependence' and a low degree of 'task uncertainty' are consequences of a high level of reputational hierarchy and constitute evidence of 'conceptually integrated bureaucracies'.

In IHD (low 'mutual dependence' and high 'task uncertainty'), the priority of particular topics and goals are difficult to establish, and the results can be obtained in diverse ways (see Chapter 7, Section 7.5.1). According to the wide range of topics and technical approaches in this field, the graduate students have to access other neighbouring fields to ensure they have not overlooked any key theories from those disciplines. For example, some participants in this field admitted that they access and use resources from the Arabic literature or geography fields to complete their research projects. However, the graduate students in this field do not have to demonstrate how their contribution fits with other research in those fields. In this field, the high degree of 'task uncertainty' encourages the heavy reliance of students on themselves to carry out their research, which can be achieved through their personal contacts and knowledge. A low degree of standardisation of technique, procedures and results in this field is likely to be associated with a high degree of 'technical uncertainty'. Therefore, this field is characterised by decentralised control over the research process and resources. In most cases, the low degree of 'mutual dependence' and high degree of 'task uncertainty' are consequences of a lower degree of reputational autocracy and constitute evidence of 'fragmented adhocracy'.

In MCD (moderate degree of ‘mutual dependence’ and ‘task uncertainty’) (see Chapter 6, Section 6.5.1), the participants confirmed that their research problems are inadequately hierarchically ordered but that the research techniques are well standardised. The combination of problem variety and multiple ordering of their importance with technical standardisation lead to a high level of ‘strategic uncertainty’. For example, the participants in this field reported that their research topics diffuse across environmental biology and medical science and sometimes rely greatly on biochemistry. They have to access resources from those areas to fulfil their topic-specific needs. This means that the MCD field shares research problems and work procedures with those areas, as well as results. However, students in this field must incorporate the specific results of others’ work into their research but do not have to show how their contribution fits with those areas, as in IHD. This indicates that technical standards are widely shared and quite specific so that the students can rely on their colleagues’ results to make their own, independent contributions. Therefore, their dependence on a particular group of colleagues, such as the supervisor or specialists in the field, to achieve the collective goals is lower than in EED. The variation in the theoretical structure in MCD reduces the level of co-ordination within the specific field and across the discipline, which in turn culminates in decentralised control over the research and resources. Therefore, this field is characterised by a moderate degree of ‘mutual dependence’ and a moderate degree of ‘task uncertainty’ compared to EED. Overall, the medium degree of ‘mutual dependence’ and medium degree of ‘task uncertainty’ are consequences of low level of reputational hierarchy and constitute evidence of ‘professional adhocracies’.

In PLD (a moderate degree of ‘mutual dependence’ and ‘task uncertainty’) (see Chapter 8, Section 8.5.1), it is important to carry out research in this field within a mix of theoretical, softer influence and practical, hard applied influence (see Chapter 2, Section 2.6.1). The high ‘technical uncertainty’ in this field is associated with variability in the research techniques and problems, while the research procedure is poorly understood and the results difficult to interpret. According to Whitley (2000), this field is likely to not be very stable, which leads PLD to develop local ways to deal with technical problems. Placing restrictions on problems and concepts allows some research techniques to become fairly standardised and formal, but the uncertainty about the results does not allow the theoretical problems to be ordered hierarchically. Therefore, the research output can be interpreted according to different perspectives, despite the common technical procedure being used. For example, participants in this field reported that they used a general procedure to analyse their data and that this

procedure is commonly employed by all graduate students in PLD. In this field, the degree of technical control over the phenomenon is obviously low compared to MCD. In addition, the uncertainty about the task outcome leads to variability in research problems and the theoretical approach, which encourages the separation of formal theoretical methods from empirical methods in this field. The intractability of the theoretical and empirical data is the foremost element that makes this field both theoretical and professional in nature. These characteristics are associated with a low level of ‘functional dependency’, as the graduate students do not need to depend greatly on the specific work of a particular group of colleagues in contributing to collective goals but argue over the relevance of those contributions to such goals and to intellectual priority in the field. While they are greatly dependent on individual control to carry out their research, that can be achieved by personal contacts and knowledge (high ‘technical uncertainty’), as in IHD. This leads to considerable variation in work practices and the development of research goals at the international level (Whitley, 2000). Therefore, in this field, decentralised control over resources at the international level can be observed, combined with the centralised control over resources at the local level. Consequently, this field is characterised by a moderate degree of ‘mutual dependence’ and ‘task uncertainty’ compared to EED and IHD. Overall, the medium degree of ‘mutual dependence’ and medium degree of ‘task uncertainty’ are consequences of a high level of reputational prestige in core areas and a low level in periphery areas, which constitute evidence of ‘professional adhocracies’.

#### **9.4.2 The role of cultural differences in shaping information use and behaviour**

The high degree of ‘functional dependence’ in EED strongly influences the widespread use of the IEEE database as an information resource. For example, the EED participants confirmed that they depend mainly on the IEEE database to access and use information resources. The highly specialised nature of the research in this field leads to considerable coordination in sharing results between specialist groups; this influences the centralised behaviour of the graduate students in terms of accessing and using digital resources. Therefore, they prefer to access and use centralised field-base databases, such as IEEE, to fulfil their information needs, while the high degree of ‘strategic dependence’ strongly influences the graduate students’ reliance upon their supervisor for accessing and acquiring the materials required to fulfil their information needs. For example, the participants in this field admit that they are highly dependent on their supervisor as an information source because the research work in this field

tends to be more coordinated and is conducted in groups. The high degree of 'mutual dependence' shapes the students' preferences to access and use e-resources more than print ones. This may be accompanied by a low degree of 'task uncertainty' (both technical and strategic). The low degree of 'technical uncertainty' in EED also strongly influences the high degree of concentration and control over key resources, and so this field uses a centralised field-based communication system via digital resources. This also strongly influences the high dependency of graduate students on accessing and using e-journals as main sources of information. Because the laboratory outcomes in this field are stable and predictable, articles are often considered to be the most common form of communication.

However, in IHD, the low degree of 'mutual dependence' (both functional and strategic) strongly influences the high reliance of graduate students on formal print publications as information resources to meet their needs. The participants in this field confirmed that they prefer to access and use print resources more than electronic ones because in this field, it is less imperative to coordinate problems and results or to share resources as a consequence of decreasing 'mutual dependence'. This may be coupled with increasing 'task uncertainty' (both strategic and technical), which makes it difficult to coordinate research problems, techniques and task outcomes. The high degree of 'strategic uncertainty' has a strong influence on the graduate students' search for information from a wide variety of resources in IHD because of the wide range of research problems (topics) and approaches. While the high degree of 'technical uncertainty' has a strong effect in shaping students' independence in searching and accessing information compared to EED, they depend on themselves to carry out their research, which is achieved by direct contact with experts in the field to help interpret their results and by searching the literature. Therefore, the library plays a central role as an information source, as do the archival institutions. The high dependence of graduate students on books as main sources of information is also strongly influenced by the high degree of 'technical uncertainty', as the results in this field are unstable and their presentation must be more detailed. Therefore, the articles can be quite long, and the research findings are usually communicated in books. This shapes the preferences of the graduate students for books over journal articles; the latter become less likely to be read or cited by the graduate students compared to EED. Whitley (2000) argued that in a field where the degree of both strategic and functional dependence is low, decentralised control over accessing resources can be observed.

In fields with a moderate degree of 'mutual dependency' and 'task uncertainty', such as MCD, the medium degree of 'mutual dependence' (high functional and low strategic dependency)

strongly influences the students' preferences to access and use multidisciplinary databases, such as Science Direct, to fulfil their information needs. This is because there is little overall concern with a hierarchy of goals, which shapes students' dependence on searching and accessing information by themselves rather than through their supervisor compared to EED. For example, students in this field confirmed that they mainly use library database such as Science Direct to access e-journals to fulfil their topic specific needs, and they depend on themselves to search for information without the interference of the supervisor. Therefore, students in this field depend on the library as the main source of information to carry out their research compared to EED. The medium degree of 'task uncertainty' (high strategic and low technical uncertainty) in this field shapes the decentralised information behaviour of the students, as they use information resources from other fields, such as health science, marine ecology and biochemistry. This is because research problems are varied, as in IHD, which also shapes their dependence on using e-journals as the main information resources. This is because research results are stable and usually communicated by articles, as in EED. The variation in theoretical structure in this field shaped the students' preference to access and use both electronic and print resources.

Conversely, in PLD, the medium degree of 'mutual dependence' (low functional and high strategic dependency), and the low degree of 'functional dependence' have a strong influence on the high reliance of graduate students on formal print publications as information resources to meet their needs, as in IHD. This is because the results are unstable and difficult to interpret. The high degree of 'strategic dependence' strongly influences the graduate students' dependence to some extent upon their supervisor as information source because the problems and goals are restricted, stable and tightly structured, similar to EED. In respect to the medium degree of 'task uncertainty' (high technical and low strategic uncertainty), it seems that the degree of 'strategic uncertainty' in this field needs to be sufficiently low to be able to develop a cohesive approach through the development of technical standards and protocols to resolve a particular set of professional issues around specific research projects. The degree of 'technical uncertainty' tends to be high because of the dominant knowledge produced by personally controlled disciplines, such as law, that increased the concentration and control over local resources. Therefore, this field concentrates on using local resources, such as the Kuwait Lawyers database, for primary resources rather than international databases, as in EED. The high degree of 'technical uncertainty' has strongly influenced the heavy reliance of students on their individual control to carry out their research and in shaping their independence in searching and accessing information without supervisor interference compared to EED. This is

achieved by relying on personal contact (e.g. legal advisor) through their personal network to make sense of their results and by searching the literature. Therefore, the library plays an important role as an information source to fulfil the students' information needs. However, students in this field access and use a variety of legal information sources, which increases the decentralised control over resources at the international level. They use books as the main sources of information, similar to IHD. At the same time, they use journal articles, as in EED, because of the limited technical control over the empirical phenomenon in this field. Table 9.12 summarises the cultural differences across the cases that shapes the information use and behaviour of the graduate students.

**Table 9-12 The relationship between 'mutual dependence', 'task uncertainty' and information use and information behaviour across the studied cases**

<b>Field</b>	<b>EED</b>	<b>MCD</b>	<b>IHD</b>	<b>PLD</b>
<b>Cultural identity</b>	A high degree of 'mutual dependence' with a low degree of 'task uncertainty'	A moderate degree of 'mutual dependence' with a moderate degree of 'task uncertainty'	A low degree of 'mutual dependence' with a high degree of 'task uncertainty'	A moderate degree of 'mutual dependence' with a moderate degree of 'task uncertainty'
<b>Concentration and control over resources</b>	Centralised control over resources	Decentralised control over resources	Decentralised control over resources	Centralised control over local resources and decentralised control over international resources
<b>Information use</b>	Uses centralised field - based digital resources (e.g. the IEEE database)	Uses multidisciplinary digital resources e.g. the Science Direct database	Uses formal print resources (e.g. print books)	Uses formal print resources (e.g. print books) and specialised local digital resources (e.g. the Kuwait Lawyers database)
<b>Information channel</b>	e-journal articles	e-journal articles	Books	Books and journal articles
<b>Information behaviour</b>	Centralised on specific digital resources and dependent on particular groups of colleagues for acquiring information	Decentralised Uses print and digital resources from neighbouring fields	Decentralised Accesses and selects information from a wide variety of sources	Centralised on using specific resources locally and decentralised on the international level Dependent on specialists in the field for acquiring information through their personal network.

In conclusion, the cultural context of the discipline has a considerable effect on shaping the information use and behaviour of the graduate students. ‘Mutual dependence’ and ‘task uncertainty’ played a central role in shaping the degree of concentration of control over the research process and accessing resources. This in turn shaped the disciplinary differences in the information use and behaviour of the graduate students.

## **9.5 Summary of the main findings**

In the analysis of the data on library use patterns, the researcher discussed the consistencies and inconsistencies on the level of KU libraries’ situation across the four studied cases in an attempt to answer the research question ‘How do KU libraries support graduate students’ research?’ To be able to answer this main question, the researcher had to find answers to the following four sub-questions:

1. What are the main factors that affect the graduate students’ library use?
2. What influence does each research stage have on the graduate students’ library use?
3. What is the main difference between the studied cases with regard to library use?
4. What are the differences between the cultures of the disciplines that shape the information use and behaviour of the graduate students?

### **9.5.1 The first sub-question**

In answering the first sub-question, it was found that the key factors that affected the use of KU libraries was the study mode, the students’ own experiences, the library services, external sources and financial adequacy, as explained further below.

#### **9.5.1.1 Study mode**

Whether enrolment was part-time or full-time was a very significant factor in predicting how the graduate students at KU use the library to support their research. This factor includes two elements: ‘availability’ and ‘accessibility’. Regarding these two elements, five items appeared to be significant barriers to the efficient use of the libraries: the unavailability of students; the unavailability of library services in the evenings; the library’s restrictions on its resources and services; the range of access points provided and language difficulties. The key factor that influenced the participants’ library use in all the studied cases was the unavailability of remote access points off campus, which negatively affected the support role of KU libraries. Another important factor revealed from the cross-case analysis was related to the library’s restrictions

on the use of its thesis and book collections, which greatly affected the participants' use of the library in all studied cases.

### **9.5.1.2 Students' experiences**

Items related to the students' personal experiences constituted another important factor that influenced the pattern of graduate students' information use. The key factor that was important in predicting some of the patterns of information use was related to the performance of KU library services. This factor appeared to act as a barrier preventing the students from using the library efficiently. Unacceptable subscription expiration and limited subscriptions to leading databases were found to be barriers to efficient information use and behaviour. The shortage of a specific Arabic book collection and Arabic database for the courses whose instruction language is Arabic was also found to be a barrier that affected the effective use of the library. Feeling negative about the library services from the very beginning was also found to be a barrier to effective library use in some cases. However, building a strong relationship with the library staff through continuous communication with the library in some cases was found to be a positive factor. Having a positive attitude towards building a private collection from the earlier stages was found to affect the role of the library negatively in the later stages in some cases.

### **9.5.1.3 Library information services**

Training and support appeared to be among the most important factors influencing the information use and behaviour of the graduate students. This factor includes four items: library service publicity, own-self training, supervisor support and module training. All these factors were highly significant in influencing KU libraries' role in supporting research. The key factor of promotional services was found to be highly significant in shaping the use of library training courses. Ineffective publicity of library services negatively affected the use of library services across all studied cases. Another factor related to integrating a training session as part of the syllabus of some courses was found to be a positive factor in some cases. The availability of one-to-one sessions only in the daytime was found to be a barrier to part-time students using this service. Another factor revealed from the cross-case analysis is the supervisor's role as an information skills trainer, which was found to negatively affect the role of the library.



#### **9.5.1.4 External information sources**

The use of other sources available outside the university libraries was also an important factor in the information use and behaviour of the graduate students. This factor includes four items: non-university libraries, the supervisor, specialists in the field and the Google search engine. The key factor that was found to be highly significant in the use of the library was the need to use specialists in the field as information sources. This item was found to affect the information use pattern of the participants across the studied cases. Searching on Google to identify information resources outside the university libraries was also found to be a barrier to the efficient use of the library's online resources. Another factor related to using the supervisor's support and other libraries located off the KU campus negatively affected the use of the library.

#### **9.5.1.5 Financial adequacy**

The ability to pay for the information sources needed was found to be the most significant factor shaping the information use and behaviour of the graduate students at KU. Being able to buy a subscription to a database provided by the library to use at home and buying journal articles or other resources online also negatively affected the use of KU libraries. This behaviour of the graduate students appeared to be a highly significant barrier to the effective use of the library for research purposes.

### **9.5.2 The second sub-question**

In answering the second sub-question, it was found that the research process had an influence on the role of the library in respect of the nature of the discipline and the information needs items. The effects of the research stages on the information use patterns of these graduate students are explained below.

#### **9.5.2.1 The influence of research stage on library use**

Regarding the nature of the discipline, the analysis revealed that the first stage had a significant effect on the topic item, the information resources and the sources used. The unavailability of the supervisor as an information source when choosing the topic makes the use pattern of the library by the graduate students relatively high, while the availability of other accessible information sources, such as professional libraries, personal collections and the supervisor to complete the proposal negatively affected their use of KU libraries. In the second phase of the research, the great demand for completing the research project increased the use of the library

for the purpose of finalising the research project. In the third stage, assessments of the library services in the students' reflections were relatively low, either because the participants depended on their personal collections or because of the shortage of Arabic information sources for certain disciplines.

### **9.5.3 The third sub-question**

In answering the third sub-question, it was found that the differences between the disciplines with regard to using the library related to the differences in their information needs. Each discipline had specific requirements that shaped its information needs. According to this study, information needs entailed the need of the students to use specific sources of information to complete their research. The differences between the disciplines regarding how students' information needs affected their use of the library are explained below.

#### **9.5.3.1 Differences between the studied cases**

It was found that there was a difference between the studied cases with regard to using the library according to their information needs. This factor includes four items: information awareness, information skills capability, information culture and IT tool needs. The participants' awareness of the most important information sources for meeting their needs appeared to be a significant factor in shaping the use pattern of the library in EED, which developed during the research stages. However, the ability of students to seek, access, evaluate and use the information resources effectively had a positive impact on the pattern of library use in MCD during the research stages. In PLD, the development of the professional needs of the participants according to their information culture during the research process negatively affected their use of the library. In IHD, the information need item that shaped students' use of the library's online resources most was different, namely the need for IT tools, as the need for online search aids in this discipline was high in later stages. This affected positively their use of the library's online services during the research stages.

### **9.5.4 The fourth sub-question**

In answering the fourth sub-question, it was found that the culture of the discipline had a considerable influence in shaping the field differences in terms of the information use and behaviour of the graduate students. Each discipline has its own cultural characteristics, which affects the students' use of information during the research process. The differences between

the disciplines in terms of how their cultures shaped the information use and behaviour of the graduate students are explained below.

#### **9.5.4.1 The influence of disciplinary culture on information use and behaviour**

Regarding the cultural structure of the discipline, it was found that there was a difference between the studied cases in terms of the cultural identity at the field level. The pattern of information use and behaviour was affected by the cultural context in each studied case. It was found that ‘mutual dependence’ and ‘task uncertainty’ played a central role in shaping the degree of concentration on the research process and resources, which appeared to be a contextual factor that shaped the pattern of information use in each field. The high ‘mutual dependence’ coupled with low ‘task uncertainty’ promotes centralised control over accessing resources, and this shaped the students’ use of a centralised field-based database in EED, in addition to their great dependence on their supervisor in accessing and acquiring information. However, the low degree of ‘mutual dependence’ coupled with a high degree of ‘task uncertainty’ promotes decentralised control over accessing resources, and this shaped the students’ use of information from a wide variety of resources and their independence from their supervisor in searching for information in IHD. A moderate degree of both ‘mutual dependence’ and ‘task uncertainty’ shaped the students use of multidisciplinary databases in MCD and independence in searching for information. In PLD, the case is different, a moderate degree of both ‘mutual dependence’ and ‘task uncertainty’ shaped the use of information resources in two ways, centralised at the local level and decentralised at the international level, with essential reliance on professional colleagues (e.g. legal advisors) for accessing and acquiring information.

#### **9.5.5 Hypotheses emerging from the study**

This section presents several hypotheses that emerged from the analysis across the four studied cases (EED, MCD, IHD and PLD) relating to the use of the library, which can be considered a contribution of this study. These hypotheses need to be tested in further research:

- There is a relationship between the range of access points provided by the library and the use of its resources and services by the graduate students.
- There is a relationship between the level of restrictions the library places on access to its services and the use of its collection by the graduate students.

- There is a relationship between the performance level of library services and the graduate students' library use.
- There is a relationship between the availability of graduate students' remote access to the library's online resources from home and their use of its resources and services.
- There a relationship between the degree of publicity that the library provides to market its services and the use of its training sessions by the graduate students.
- There is a relationship between the availability of other accessible libraries on which the students can depend to meet their needs and their use of the university library.
- There is a relationship between the students' dependence on specialists in the field as an external source to meet their information needs and their use of the library resources and services.
- There is a relationship between the students' financial capability to buy the information resources they need and their use of the library.

Other hypotheses emerged from the analysis across three of the studied cases and may also be worthy of further investigation:

- There is a relationship between the availability of the supervisor as an information provider when the students select their topic and the use of library resources and services.
- There is a relationship between the availability of alternative information sources, such as the supervisor, professional libraries and personal collections, in building proposals and the use of the library.
- There a relationship between the graduate students' demands to complete the research project during the mid-stage and their use of the library.
- There is a relationship between the limited availability of the students on campus during the daytime and their use of the library resources and services.
- There is a relationship between the availability of the training services provided by the library and the students' dependence on their personal efforts to improve their information skills.
- There is a relationship between the role of the supervisor as an information skills trainer and the role of the library in improving the students' information skills.
- There is a relationship between the students' dependence on Google as an external source to meet their information needs and the use of library resources and services.
- There is a relationship between the level of students' foreign languages skills and their use of the library's foreign languages resources.

## CHAPTER 10 – DISCUSSION

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### 10.1 Introduction

This chapter discusses the findings of the study based on the aims and objectives and in view of the relevant literature. The discussion particularly focuses on the factors that were found to be significantly associated with the information use and behaviour of taught graduate students at KU and the supporting role of the university libraries. A number of factors emerged from the current study that may inform the provision of KU library services in supporting graduate students' research. The key factors are discussed in Sections 10.2 to 10.7.

### 10.2 Demographic factors

Demographic influences were found to have a significant influence on the role of the library in supporting the students when engaged in research. The ages and gender of students were found to be a significant factor affecting their use of the library. These factors are discussed in the following sub-sections.

#### 10.2.1 Students' age

The quantitative findings of this study (determined using Mann–Whitney U tests) show that younger graduate students (under 26 years old) were less likely to be familiar with the use of specific library services than older students at KU. This may possibly be because younger students have less experience and knowledge of the specific services provided by the library in the earlier stage of their research, which negatively affects their use of the library. This finding agrees with the findings of Fosmire and Radcliffe (2014), who found that a lack of familiarity with the information systems provided by the library leads to its non-use. This suggests that the promotion of information skills training for graduate students when they begin their graduate programmes is essential to improve their use of the library in the early stages of their research.

#### 10.2.2 Student' gender

The questionnaire results (obtained using chi-square tests) suggest that gender is another factor that influences library use. Given that there is no specific difference in the number of males and females in the total population of the sample, it was found that female students were more likely to regularly visit the library in person compared to male students. This indicates that female students in Kuwait have a more positive attitude towards physically visiting the library

than male students. This supports Al-Muomen's (2009) finding that female graduate students at KU are more likely to search for information in the library and are more confident about using print resource than males. This may be related to the findings of Ford *et al* (2001) and Manda and Mulkangara (2007), whose studies revealed that females tend to experience greater difficulty in finding information online than males. This may be related to the socio-cultural characteristics of gender that leave women feeling more anxious about computer searches (Enochsson, 2005). However, the results of Funmilayo (2013) contradict these findings and indicate that male graduate students in Nigeria visit the library in person to utilise its resources more than female students. This might be because the majority of female graduate students in Nigeria are married and are busy with other responsibilities, such as caring for their homes and children. These activities consume much of their time and affect their ability to visit the library in person.

### **10.3 Academic factors**

Academic background was also found to have a significant effect on the role of the library. Several factors were found to influence the graduate students' information use and behaviour and their interaction with KU libraries, such as the academic discipline, cultural context, information needs, research stages and the mode of study. These factors will be discussed in the following sub-sections (10.3.1 to 10.3.4).

#### **10.3.1 Academic discipline**

The results of this study show that the specific nature of the academic discipline dictates the types of resources and services to be used by the students to meet their information needs. The impact of the different disciplinary natures on the overall use of the library by graduate students at KU will be discussed below.

##### **10.3.1.1 Disciplinary differences**

The quantitative findings (obtained using chi-square tests) revealed that the arts discipline was more likely to use print documents than other disciplines, while the engineering discipline was the least likely to do so. This reflects the heavy reliance of arts graduate students at KU on print materials compared to students in the other disciplines. This might be because the majority of the desired Arabic resources, such as books, are available in print format only, with very few available electronically. It is important to note that most of the arts programmes at KU are taught in Arabic. The findings are consistent with the results of other studies carried out

elsewhere (Tahir, 2008; Tahir *et al*, 2010; Wu and Chen, 2012; Dahl, 2013) that have found arts and humanities students still prefer print books to electronic ones and are slow to adopt new technology. In contrast to respondents from other disciplines, such as law, science and engineering, Khan and Bhatti (2012) found that law researchers use the Internet to search for information in addition to personal print collections. Al-Muomen (2009) found that science students use e-resources more than arts and humanities students use and fewer print materials. Rowlands (2007) found that engineering graduate students rely heavily on e-resources more than any other sources. These findings indicate that academic discipline has an impact on the type of information resources used by graduate students. According to Kemp and Jones (2007), subject area is a significant factor affecting the use of digital resources across disciplines. This suggests that librarians who seek to develop information skills training workshops for graduate students need to consider the differences between the disciplines in terms of the types of materials most commonly used.

The quantitative results show differences based on academic discipline with regard to library service use. Science graduate students are more likely to be familiar with the use of DD, information desks, e-journals and e-books. This finding is in agreement with Vezzosi (2008), who found that life sciences graduate students frequently use the ILL and DD services and often access the scientific digital collections of the library. In contrast, arts students are more likely to be familiar with the use of online catalogues and bibliographic databases. This finding is compatible with that of Tahir *et al* (2010), who found that online catalogues, online bibliographies and full-text databases are regularly used by arts and humanities students, while law students are the least familiar with the use of specific services, such as DD, bibliographic databases and e-books. This contradicts Makri *et al*'s (2008) finding that legal researchers use a set of e-resources, including legal databases such as Lexis Nexis and Westlaw, for their research. These results perhaps reflect the nature of legal education at KU, as most of the graduate law programmes are taught in Arabic. Therefore, law students have to use mostly Arabic legal collections, which tend to be only available in print format. In addition, most of the international legal databases provided by KU libraries are in English, which is not be useful for those seeking information in Arabic. Therefore, the low use of bibliographic databases by law graduate students at KU compared to other students in other disciplines was predictable.

It is clear that the different disciplinary natures impact overall library use. Those who design library services to support graduate students' research therefore need to consider this fact. The question that arises in the context of this study is 'What causes the difference between the

disciplines with regard to information use and behaviour?’ This question will be answered in the following sections.

### **10.3.2 Cultural context differences and information use and behaviour**

The qualitative results (cross-case analysis) based on the application of Whitley’s theoretical framework revealed that each discipline has its own cultural identity that determines the differences in information use and behaviour between the disciplines, as discussed earlier in Chapter 9 (Section 9.4). Different cultural contexts were found to cause variations in information use and behaviour across the four studied cases (EED, IHD, MCD and PLD). These will be discussed in Sections 10.3.2.1 to 10.3.2.4.

#### **10.3.2.1 Electrical engineering field**

The findings of this study revealed that the cultural structure of EED reflects the high degree of ‘mutual dependence’ and low degree of ‘task uncertainty’ that determines the centralised control over the research and resources in this field (Chapter 9, Section 9.4.1), which in turn influences the information use and behaviour of the graduate students (Chapter 9, Section 9.4.2). It was found that students in EED prefer to access and use centralised field-based digital resources, such as the IEEE database. This is in line with Fry (2006a)’s finding that fields with low ‘task uncertainty’ are readily catered to by digital information resources. According to Chu and Law (2008), electrical engineering students have specific needs (e.g. software to help with designing) and therefore can find most of the information they need on *IEEE Xplore*. In addition, the results show that these students prefer to access and use e-journals. This is consistent with Johnson (2013), Williams and Fletcher (2006) and Kushkowsky *et al* (2003), who found that e-journals are the resources most heavily used by engineering graduate students. It was also found that students prefer to access and use e-resources more than print ones. Fry and Talja (2007) stated that high degree of ‘mutual dependence’ plays a central role in shaping the use of e-resources. This is in agreement with Engel *et al* (2011), Hasoomi and Mehraban (2011) and Rowlands (2007), who found that engineering researchers tend to use e-resources more than others and because of their increasing use of e-resources, their visits to the physical library decreased. Tucci (2011) found that engineering researchers believe the library’s physical collection should be transferred to online resources. This may explain why electrical engineering graduate students at KU are less likely to visit the library in person and prefer to access it remotely through the departmental website, especially as their research culture is usually based on lab work.



The findings of the current study show that EED participants are characterised by their high reliance on their supervisors (particularly during the first stage of research) to access and acquire the materials needed to fulfil their information needs, which is strongly influenced by their high degree of ‘mutual dependence’. This behaviour is confirmed by many studies (Gerstberger and Allen, 1968; Gralewska-Vickery, 1976; Allen, 1977; Hertzum and Pejtersen, 2000; Hertzum, 2002; Tenopir and King, 2004; Du Preez and Fourie, 2009; Fosmire and Radcliffe, 2014) that show colleagues are perceived as the most accessible and familiar sources of information for engineering researchers. Leckie *et al* (1996) found that engineering students engage in highly context-specific information behaviour and oral conversations with individuals as a preferred information source. According to Hertzum (2000), because of the specific culture of the discipline, engineering researchers need to acquire accurate and immediate information that is located in the heads of their colleagues or in publications.

### **10.3.2.2 Islamic history field**

Regarding IHD, the research findings show that the cultural context of this field is characterised by a low degree of ‘mutual dependence’ and a high degree of ‘task uncertainty’ that determine the decentralised control over research and resources (Chapter 9, Section 9.4.1) and influence the information use and behaviour of graduate students (Chapter 9, Section 9.4.2). This is in line with Fry (2006a), who found that disciplines with a high degree of ‘task uncertainty’ are less successful in taking control of the channels of communication. According to Tahir *et al.* (2010), different studies emphasise that the nature of humanistic research, which is characterised by esoteric topics in various subject areas, makes it necessary to use information from various resources. The findings of the current study also show that the library and archival institutions play a central role as information sources for IHD research students. This is in agreement with Warwick *et al* (2008), who found that information sources, such as libraries, archives, museums, research centres and web pages, provide information that is vital for humanities researchers, particularly historians. One consequence of increasing degrees of ‘task uncertainty’ is that graduate students depend on themselves to carry out their research through direct contact and literature searches, which increases their independence from their supervisors when searching and accessing information to meet their needs. This is in line with Tahir *et al* (2008; 2010), who found that the library is still the main source of information for humanities scholars and that their preferred method for gathering information is consulting subject-matter experts, followed by conversations with colleagues. According to RIN (2011),

the role of the supervisor in the history discipline is primarily to provide guidance about where to find information, as students tend to work autonomously.

The study findings show that the participants in this field travel abroad to gather information relevant to their specific topic. Although the nature of history discipline requires travelling to search for ancient information that is not easy to track down, the most interesting fact that emerged from the data is that some IHD participants travel outside the country to obtain secondary resources, such as monographs, or to seek advice from experts in their subject area. This is partly consistent with Rutner and Schonfeld (2012), who found that depending on the research topic, some historians visit overseas archives and collections. It also partly contradicts the same author's finding that historians travel to seek advice from local experts in their subject area. This reflects the fact that personal contact with experts in the field is part of the culture of this discipline, as students are fundamentally autonomous and personal contact is crucial in interpreting their results. Therefore, KU students have to travel abroad in order to access the material they require to meet their information needs.

The IHD participants prefer accessing and using print resources more than electronic ones because they rely heavily on Arabic print publications to meet their information needs, which in turn is due to the discipline's low 'mutual dependence'. This result contradicts the earlier study by Chassanoff (2013), who found that both print and e-resources are used by historians, in addition to a combination of personal and online techniques to acquire information during the research process. This may be related to the fact that because the language used in Islamic history culture is Arabic, students necessarily rely heavily on Arabic language publications—which are mostly available only in print formats—to meet their information needs. Sporkin (2012) found that in the past few years, the use of e-books as a secondary source for historians has grown dramatically. This may reflect the fact that a lack of online Arabic information resources and a lack of English language proficiency among graduate students (as the main instruction language in this field is Arabic), together with the traditional learning style in the Islamic history discipline all influence the students' preference for accessing and using print resources. However, graduate students in IHD show quickly adopt new technology (IT tools) when this helps speed up their research process. In addition, they consider the university library's website, which allows access to the online catalogue, to be the most important resource, even compared to Google. This is in agreement with Martin and Quan-Haase (2013), who found that convenience and speeding up the research process were the main factors prompting the use of IT. IHD students also strongly depend on books as a main source of

information because of the high degree of ‘task uncertainty associated with this field. This is consistent with Tenopir *et al* (2008) and Tahir *et al* (2010), who found that humanities researchers read relatively fewer journal articles, even in print, while reference books and the library catalogue have been identified as the most important information sources.

### 10.3.2.3 Microbiology field

The findings of this research show that the cultural structure of MCD reflects a moderate degree of ‘mutual dependency’ (high functional and low strategic dependency) and ‘task uncertainty’ (high strategic and low technical uncertainty) and that this determines the decentralised control over the research and resources in the field (Chapter 9, Section 9.4.1), which affects graduate students’ information use and behaviour (Chapter 9, Section 9.4.2). It was found that students in this field prefer to access and use multidisciplinary databases, such as Science Direct, to fulfil their information needs, which was found to be highly influenced by a medium degree of ‘mutual dependence’. This finding is compatible with several studies (Aqil and Ahmed, 2011; Hightower and Caldwell; 2010; Vezzosi, 2009; Atilgan and Bayram, 2006) that found the majority of life sciences researchers use Science Direct to meet their information needs. It was also found science graduate students are independent of their supervisors when searching and accessing information. This is in line with Singh and Satija (2008), who found that life sciences students use their supervisors as the second source of information after the library. However, the majority of the participants in this study regard the library as a main source of information in conducting their research. This is in accordance with previous studies (Satish- Kumar *et al*, 2011; Vezzosi, 2008; Atilgan and Bayram; 2006) that found life sciences researchers express a positive attitude towards the library and often access its scientific digital collections. The studies by RIN (2009) and Nicholas *et al* (2010) contradict this, however, as they show that life sciences researchers count on using general search engines more than browsing the library. The consequences of the moderate degree of ‘mutual dependence’ in this field may explain why MCD students in the context of KU are highly dependent on the library to carry out their research and make less use of their supervisors as an information source compared to with EED students.

The findings of this study revealed that a medium degree of ‘task uncertainty’ strongly influences the students’ preference with regard to accessing and using various scientific sources. While, medium degree of ‘mutual dependence’ strongly influences the use of both e-resources and print ones. This is consistent with Bartlett *et al* (2012) and Satish-Kumar *et al* (2011), who found that life scientists make use of a variety of information sources and utilise

both print and e-resources for different reasons. It was also found that they prefer to access and use e-resources more than print ones, which is strongly influenced by the high degree of 'functional dependence'. This is supported by the findings of both RIN (2009) and Sethi and Panda (2012). Moreover, it was found that MCD participants rely heavily on e-journals as the main information sources, which is highly influenced by the low degree of 'technical uncertainty'. This is in agreement with Niu and Hemminger (2011) and Sethi and Panda (2012), who found that the main e-resources used by life sciences researchers are online journals that are subscribed to by their library and open access journals. The consequence of the medium degree of 'task uncertainty' in this field may explain why the MCD students in the context of KU need to access and use information resources from other neighbouring scientific fields, such as medical science, environmental science and sometimes biochemistry.

#### **10.3.2.4 Public law field**

The findings of this study show that the cultural structure of PLD reflects a medium degree of 'mutual dependence' (low functional and high strategic dependency) and a medium degree of 'task uncertainty' (high technical and low strategic uncertainty) and that this determines the decentralised control over resources at the international level and the centralised control over resources at the local level (Chapter 9, Section 9.4.1), which influences the information use and behaviour of the graduate students (Chapter 9, Section 9.4.2). It was found that the graduate students in this field rely strongly on formal print publications (e.g. legal books) as information resources and make less use of their colleagues to access and acquire information compared to EED students as a consequence of the medium degree of 'mutual dependence'. This is in agreement with Thanuskodi (2009), who found that law researchers prefer to use print resources over the library's electronic ones. Otike (1999) and Al Daihani and Oppenheim (2008) found that law researchers consult their colleagues before moving on to print sources.

The results of this study show that the medium degree of 'task uncertainty' shapes the graduate students' preferences with regard to accessing and using local EIRs, such as the Kuwait Lawyers database, and their heavy reliance on individual control in conducting research, which can be achieved by depending on their personal networks and by searching the literature. The ambiguity of their results make personal contact with legal advisor is essential for interpreting them. Participants in PLD, also show their independence from their supervisors when searching and accessing information. These findings are in line with the study by Bhardwaj (2012), who found that the majority of Master's law students are aware of the electronic database and use it frequently to locate case law. Otike (1999) and Al Daihani and Oppenheim (2008) found that

law researchers usually seek information themselves without assistance and use their colleagues or personal contacts to gather information. It should be noted that although the use of local databases has been found to be shaped by the culture of PLD, few participants in this study stated that they use the 'Kuwait lawyer' database for their research. This may be because most of the participants in this discipline are part-time students, and remote access to this database is not available. The medium degree of 'task uncertainty' in this field may explain why PLD students in the context of KU need to use unpublished information, such as 'specialist commentaries' and why they depend on their personal networks to acquire this type of information in addition to the published information available at the library.

It was found that the library plays an important role as a source of information in fulfilling the information needs of PLD students. This is in agreement with Ossai (2011), who found that most law students are heavy users of library resources throughout their academic course. Moreover, it was found that they use a variety of legal information sources. This is supported by Otike (1999), who found that legal researchers use a variety of information, including law books, law journals, reference books, newspapers, law reports, etc. In this field, books were found to be the main source of information, followed by journal articles. This finding contradicts that of Burman and Sheela (2011), who found that journal articles are the main sources of information used by Master's law students for their research, followed by books. Al Daihani and Oppenheim (2008) found that although journals were among the major information sources for law faculty members at KU, the majority scan only one or two journals; books remain the most popular source of information for their research. It seems that law graduate students at KU follow the same pattern as their supervisors regarding their preference for using books over journal articles in their research.

The most interesting issue that emerged from the analysed data relating to the PLD graduate students' information use and behaviour is 'travelling to the source'. This behaviour is unrelated to the cultural context of this discipline and is not mentioned anywhere in the literature relating to the law discipline. It was found that PLD graduate students at KU travel remotely to courts to acquire recently issued legislation or decisions. Although this type of information is provided by their college library through the Kuwait Lawyers local database, few of the participants stated that they used this database to acquire these primary sources. This may be because they feel that the information in this database may be outdated, and therefore they travel to the courts to gain the most recent information. In addition, it was found that the majority of the participants in this field confirmed that they have to travel abroad to acquire

information in the form of monographs to meet their topic-specific needs, as their college library book collection is perceived to be insufficient. This travelling behaviour can be considered a specific characteristic related to the law discipline in the KU context, as the literature does not mention law students in other countries doing this. This finding requires further investigation to understand the reasons behind the travelling behaviour of the PLD graduate students to acquire information resources.

In the context of this study, information use and behaviour were found to vary across the disciplines. The cultural context of each discipline has an impact on shaping the information use and behaviour of graduate students, which in turn shapes their interaction with the library's resources and services. Disciplinary differences in this study raise concerns for the library regarding the necessity of differentiating between the disciplines in terms of graduate students' information use and behaviour when designing services to support their research.

### **10.3.3 Information needs differences**

The qualitative results of this study show that each discipline has its own information requirements that shape the information needs of the students, as mentioned in Chapter 3 (Section 3.7). According to the nature of the different disciplines, the context of their information needs differed. Four key factors emerged in the context of KU that affect the information use and behaviour of the graduate students and their interaction with the library based on their information needs. Particular concerns about each factor in comparison to other studied disciplines are discussed in Sections 10.3.3.1 to 10.3.3.4.

#### **10.3.3.1 Information awareness**

The findings of this study show that information awareness is a factor that affects EED graduate students' library use based on their information needs. Students' information needs develop as their research progresses. Chu and Law (2008) state that students' information needs grow during the research process based on their knowledge of their research topic. In the current study, it was found that EED students lack awareness about the importance of the library as an information source for their research in the initial research stage compared to MCD, IHD and PLD students. This is in line with Eckel's (2009) finding that electrical engineering graduate students appear to be completely unaware of the library's resources and services before meeting the engineering librarian. In the context of KU, this may be related to the fact that the electrical engineering programme does not integrate library awareness sessions into courses either at the

undergraduate level or the graduate level, which results in students starting their college with a negative picture about the importance of the library as an information source. A lack of awareness about the importance of the library in meeting the students' information needs in the initial stages has a negative impact on using its resources and services to support their research. Similarly, Hamade and Al-Yousef (2010) found that taught graduate students at KU do not fully utilise the library's e-resources and services, which may be attributed to their lack of awareness and lack of competence regarding the use of the library's information resources. However, it was found that the students' information awareness increases in line with the development of their information needs, supervisor's recommendations and experience in searching for information along the research process. The study results suggest that the Engineering Library might promote its services to graduate students before they start the programme to raise their awareness about the ability of its electronic services to support their research.

### **10.3.3.2 Information skills capability**

The findings of this research reflect different situations in MCD regarding the information needs aspect in comparison with EED, IHD and PLD. Information skills capability was found to be a factor that positively affects the use of the library by MCD graduate students. Confidence in being able to identify the appropriate information source to meet the students' information needs was found to be a positive factor that affects the use of library resources and services from the very beginning. This may be related to the fact that integrating formal information literacy into courses designed by the Biology Department at KU at both the undergraduate and graduate levels makes students more familiar with the library services and identifies the important sources to meet their needs. This is consistent with Smith (2003), who found that integrating information literacy in the curriculum is valuable in developing the information skills capabilities of science graduate students. That study focused on the development of laboratory research skills and on how to search the literature in their discipline. Their information skills capability increases in line with their developing information needs, supervisors' recommendations and experience in searching for information throughout the research stages. This suggests that the library might integrate information literacy training into the curriculum at the graduate level. Librarians should contribute to the information literacy course given by faculty members to educate graduate students on how to use library resources and services to improve their information skills.

### 10.3.3.3 Information culture

The results of this study show that information culture is a significant factor in shaping law students' library use based on their information needs in comparison to EED, MCD and IHD students. The use of the library is controlled by the extent to which its resources and services can fulfil the students' theoretical and professional information needs. It was found that the PLD requires students to rely on 'specialist commentaries' to support their research work and fulfil their subject-specific needs. Al-Daihani and Oppenheim (2008) noted that legal researchers in Kuwait regard commentaries as a very important source of detailed information for their research. It is evident from the qualitative results that the Law Library does not provide this service to enable graduate students to fulfil their professional information needs through consultations with legal experts, which affects its use negatively throughout the research stages. In addition, it was found that law students need specific Arabic legal books to support their research to fulfil their theoretical needs. Otiye (1999) and Al-Daihani and Oppenheim (2008) found that legal books were the most popular information sources for law researchers simply because these books usually contain collections of new legislation, together with amendments to the previous legislation to support their theoretical needs. However, the majority of the PLD participants complained about the lack of an Arabic book collection in their college library relating to their specific topic, which forced them to use other professional libraries or to travel abroad to obtain what they needed. This was supported by the quantitative results (using the Mann-Whitney U test) that the Law Library was less likely to provide graduate students with the required research materials than other disciplines. In the context of this study, it seems that the Law Library is unable to fulfil either the professional or theoretical needs of the law graduate students, which affects its use negatively throughout the research process. The study by Al-Daihani and Oppenheim (2008) revealed a similar finding—that the low use of the Law Library at KU by law researchers is due to its inability to fulfil their needs. Feliciano (1984) found that the availability of legal resources was among the primary factors that determines the usefulness of law libraries. KULA might wish to pay more attention to the provision of text materials at the Law Library and assign sufficient funds to develop the library's collection of Arabic legal books to meet the information needs of the graduate students. In addition, recruiting legal specialists to provide the students with specialist commentaries is essential to support their research.



#### 10.3.3.4 IT tool needs

The findings of this research reflect the different situation in IHD regarding information needs compared with EED, MCD and PLD. IT tool needs were found to be a factor affecting the use of the library's electronic services. It was found that IT tool use was associated with the increasing demands of the research process. Most IHD participants in the first stage of their research confirmed that they use the library card catalogue to locate books, either because they preferred to do so or because they had no idea about how to use the library's online catalogue. This may reflect the traditional culture of the Islamic history field, as traditional finding aids are preferred to electronic ones. In addition, the research culture of this field requires textual references to be dug out and reviewed item by item; therefore, the use of traditional tools at the beginning may help them to avoid missing any items contained in the library related to their research topic, particularly when they are carrying out background reading. Similar findings were revealed by Chassanoff (2013), who states that history graduate students often use published finding aids or consult an archivist to locate primary sources in the early stage of their research. This perhaps reflects country-specific differences, as original card catalogues are no longer available at most arts libraries in the UK. Therefore, historians have to use the online finding aids to search for information they need. It was also found that the use of library IT tools developed among IHD graduate students according to the growing need to speed up their research in the later stages. The majority of IHD participants confirmed that they used library IT tools, such as online catalogues and online manuscript indexes, in the later research stages. This is consistent with Case, (1991) and Delgadillo and Lynch (1999), who found that history graduate students quickly adopted new technology if it speeded up their research process. Dalton and Carnigo (2004) and Rutner and Schonfeld (2012) found that the application of e-resources has increased historians' use of online catalogues and indices in their effort to identify primary and secondary sources. They confirmed that digitisation of primary sources and findings aids has changed many aspects of the archival search process of historians.

In the context of this study, information needs were found to vary across the different disciplines and throughout the research process. Specific factors associated with the information needs of each discipline had a great impact on the use of KU libraries by the graduate students. Librarians need to recognise the differences between the disciplines and that each discipline has different requirements that shape the information needs of graduate students. Librarians should also be aware that the expectations of taught graduate students might well differ from those of undergraduate students.

### 10.3.4 Research stage

The findings of this study (cross-case analysis) showed that research stage was identified as a factor shaping the students' interaction with the library. This is consistent with Al Muomen (2009), who found that the research stages could be a significant factor in information use. In the context of this study, the role played by the supervisor as an information source in the process of selecting topics and building research proposals, such as in EED, negatively affects the use of the library in the first stage. The use of alternative sources in PLD, such as professional libraries or personal collections, as in IHD, decreases the use of the library. It is predictable that the use of the library should be increased in the first stage, as the students have less knowledge about their topic and how to develop the research proposal. However, the results indicate that the availability of other information sources at this stage tempered the support role of the library. This finding is consistent with RIN's (2007) research findings that the library's role may become diluted as young researchers turn to social network spaces as a source for sharing and acquiring research-based information.

In addition, it was found that the use of the library increases in the mid-stage as the demand for completing the research projects increases, as clearly identified in all case studies. This result is supported by Al Muomen's (2009) finding that graduate students in the later stages were more likely to use library e-resources than students in the initial stages. The quantitative results (using Spearman's rho) indicated that the frequency of physically visiting the library decreases in line with the increase in the level of study of the graduate students. This is confirmed by both Engel *et al* (2011) and Beard and Bawden (2012), who found the increasing use of e-resources by graduate students, meant that their physical visits to the library decreased. This indicates that, as the students' research progresses; they tend to access and use the library virtually more than physically because they have become more familiar with the library online resources and services in the later research stages.

The qualitative results revealed that the use of the library decreased as the students' research-related collection grew in the final stage (reflections on students' experiences). This result reflects the fact that taught graduate students at KU have positive attitudes toward building their own research collection during the research stages, which negatively affects the use of the library in the final stage.

There are few studies in the literature that shed light on the importance of this factor (research stages) in shaping the use of the library by graduate students. The only research that mentioned the impact of this was that of Al Muomen (2009), RIN (2010) and ARL (2012).

According to the results of this research, librarians should be made aware of the variation in the use of the library by taught graduate students throughout the different research stages. To support students during the initial stage and to enhance the library's role, librarians should provide information skills training and library instruction to help in developing the research proposal, as suggested by the literature (RIN, 2010). To increase the library's support role in the final stage, librarians should provide support by raising the awareness of graduate students about how they disseminate their results and about author's rights and copyright issues, as recommended in the literature (ARL, 2012).

### **10.3.5 The mode of study**

The qualitative findings of this research (cross-case analysis) revealed that students' enrolment (part-time or full-time) had a very significant effect on students' interaction with the library. The majority of part-time interviewees complained that they did not have enough time to physically visit the library. This was supported by the quantitative results (using the chi-square test) that full-time taught graduate students were more likely to visit the library regularly and frequently, whilst part-time students were more likely to occasionally, rarely or never visit the library in person. This might be related to the fact that due to their job commitments, part-time students have less time to physically visit the library, while full-time students are available during the day and can use the available library resources and services. This result was confirmed by Jiao *et al* (1996), who found that the part-time study mode is an indicator of the reduced opportunity for those students to visit the library, which in turn agrees with Al-Muomen's (2009) finding that part-time students are more likely to conduct their search for information in offices or at home. In the current study, it was found that when part-time students visited the library in the evening, they could not find a librarian to help them. The librarians could promote online tutorials on how to use the library services so that part-time students can benefit from these services when the professional librarians are unavailable in the evenings.

The qualitative findings also revealed that the availability of library services is another factor associated with the students' study mode. Some library services, such as ILLs and photocopying services, were available only during the daytime. The majority of part-time students participating in this study complained about their inability to use these services, which

negatively affected their use of the library. This was also supported by the analysis of the questionnaire's open questions. Regarding the photocopying services, it is worth mentioning that KU libraries, in addition to providing traditional photocopying services that are available only during the day, also provide self-service photocopying. It seems that part-time participants were unaware that they were eligible for a touch key or magnetic card provided by the library to use the self-service photocopier, which is available all day long. Two suggestions might be made to KULA:

- Upgrade the physical ILL services to an online service that is available 24/7 so that graduate students can benefit from this service to support their research.
- Launch virtual tutorials on the library's website about the specific services provided to graduate students to inform part-time students in particular about what services are available to them, as they are less likely to visit the library in person.

In addition, the library's hours were an issue that emerged relating to the study mode factors. It was found that some EED and MCD participants expressed dissatisfaction with the length of the library's hours. This issue was also raised through the questionnaire's open question analysis. There was no evidence provided by PLD and IHD participants regarding dissatisfaction with the availability of the library. This might be because these disciplines are theory-based subjects and students are not required to spend most of their time doing lab work, as in MCD and EED, but have sufficient time to visit the library during its hours of operation. Although the quantitative analysis shows that the majority of the participants in this study were satisfied with the library's hours, the issues raised by the qualitative results may explain the low level of dissatisfaction (10.2 %) with the library's hours in this study. Pareek and Rana (2013) reported similar findings, as some participants (10%) perceived that the library's hours were insufficient to meet their needs.

The unavailability of remote access off-campus was found to be a significant factor associated with the students' study mode that affected their use of the library in the context of KU. The majority of the students (part-time and full-time) participating in this study claimed that the library should improve its accessibility and provide them with usernames and passwords to access the library remotely from home. This was also supported by some indications from the questionnaire's open question analysis. This result is in line with the findings of Urquhart and Rowley (2007), Parameshwar and Patil (2009), Ani *et al* (2010) and Kayongo and Helm (2012) that home-based access to the library's online resources is demanded by users across all disciplines. Al-Muomen *et al* (2012) found that the major problems faced by students at KU

are slow Internet access, database connection failure and difficulties in obtaining usernames and passwords from the library. This finding suggests that KULA should extend its online remote services so that the students, particularly part-time ones, can benefit from the services offered by the library to meet their needs. In addition, facilitating the process of obtaining remote access information was recommended to speed up the service to support students' research.

Restrictions on the use of library collections, such as the thesis and book collections, was also an issue that emerged relating to the study mode factor that affects library accessibility. The majority of the participants in the study (part-time and full-time) were dissatisfied with the restrictions on borrowing or photocopying theses, which affect accessibility. This is in line with Al-Muomen *et al* (2012), who found that high levels of bureaucracy and restrictions on the availability and types of information resources at KU act as a barrier to accessing the library services. This finding suggests that KULA should reduce its restrictions on the thesis collection so that graduate students can gain greater access to the library collection.

## 10.4 Cultural factors

The qualitative results of this study suggest that the language barrier and financial adequacy are cultural factors associated with the use of the library by taught graduate students at KU. The effects of these factors are discussed below.

### 10.4.1 Language barrier

This research shows that the language barrier is an important factor that affects the students' use of library information resources. It was found that students across the studied disciplines faced difficulties when interacting with foreign language resources. For example, the MCD participants complained of their inability to identify the keywords necessary to properly search the subject-specific databases, particularly in the initial stages, due to their limited English vocabulary. This result is supported by Hughes (2005) and Hughes *et al* (2007), who explained that the major difficulty faced by students with regard to using information is related to poor English vocabulary. Al-Muomen *et al* (2012) found that English language proficiency was among the main cultural influences on KU graduate students' use of e-resources. This reflects the fact that the majority of the databases provided by KU libraries are in English, which affects their use by students who have limited English language skills. As confirmed by Al-Abassi (2007), most of the library databases at KU offer resources in English. In order to make sense of database instructions, use appropriate key words, understand the search results and evaluate

the materials, good English language skills are required. It is necessary to increase the quantity and quality of the Arabic indexes and databases in the Arabic world.

In addition, the majority of IHD and PLD participants complained about their inability to access and use resources in English or other foreign languages as their programmes were taught in their mother tongue. This is in agreement with the findings of Tahir *et al* (2010) and Pareek and Rana (2013), who found that online databases are rarely used by humanities students because of the language barrier, as most of the materials provided in the databases are in a foreign language. Elzawi *et al* (2012) confirmed that the unavailability of relevant information in Arabic on the Internet and a lack of English language proficiency were the most commonly reported barriers to academics' effective use of the Internet at the university.

PLD participants complained that even the librarians at their college libraries lacked the English language skills to help them access the library's foreign language materials, which negatively affected their use of the library. IHD participants also complained about their inability to access and use the historical foreign language resources essential for their research because of their lack of knowledge of those languages.

The study results reflect that the language barrier is a significant factor that influences the use of information resources by graduate students at KU, particularly those in the disciplines taught in Arabic. One implication of this is the need to recruit librarians who are proficient in English, particularly in the Law College library, to help graduate students use the available library resources. There is also a need to provide translation services for other foreign language resources needed by other disciplines, such as public law and Islamic history, to enable users to access and use the available resources effectively.

#### **10.4.2 Financial adequacy**

In the context of this study, it was found that the capability to pay for the information resources needed is a significant factor that affects the use of the library. The use of information resources was found to be associated with the ability to purchase such resources in the Kuwaiti context. Some of the participants across the studied disciplines confirmed that they subscribed to the databases provided by the library in order to use them at home, which negatively affected the use of the library. Some students buy journal articles online because they cannot wait for ILL requests to be delivered by the library. The majority of PLD and IHD participants build personal book collections despite the availability of these books in their college library. It can be reasonably speculated that due to the high socio-economic culture of Kuwait, which results

in higher wages for many public employees, the students are able to pay for resources whenever needed. As Hvidt (2013) noted, Kuwait is ranked as the world's eleventh richest country by income.

## **10.5 Library information services factors**

The results of this study suggest that publicising library services and providing training sessions were significant factors associated with library use by taught graduate students at KU. The influence of these factors is discussed below.

### **10.5.1 Promotion of services**

The findings of this study (qualitative and quantitative) revealed that ineffective library services publicity appeared to be another significant factor affecting the use of the library across the studied disciplines. It was found that the majority of the participants in this study lack awareness about the specific services offered by the library. This was also supported by some indications from the questionnaire's open question results. The same point has been raised by Osinulu (1998), Manuel (2003), Jankowska *et al* (2006), Graham (2008), Hamade and Al-Yousef (2010), Al-Muomen *et al* (2012), Onifade *et al* (2013) and Namugera (2014), who confirmed that a lack of awareness among graduate students about the specific services that libraries offer reduces their use of the library. Manuel (2003) and Graham (2008) suggested that publicity is important to the success of information literacy workshops. However, the survey results (using a chi-square test) showed there was a significant difference between the disciplines regarding the publicity about their library services. The majority of participants from the arts and law disciplines in this study were less likely to perceive that the library publicised its services than those from the science and engineering disciplines. This result indicates that the marketing programme for the Science Library and the Engineering Library at KU are more effective than those for the Arts Library and the Law Library. This may be related to the fact that science disciplines are more reliant on using e-resources and services than humanities disciplines.

Some of the interviewees confirmed that their professors had informed them about workshops to develop their information skills rather than the library. Even those who admitted they attended the workshops provided by the library reflected that the available workshops were insufficient to meet their specific needs. Similarly, Al-Muomen *et al* (2012) found that graduate students who attended library training sessions were often dissatisfied with the outcome and

perceived the sessions as insufficient. Pareek and Rana (2013) noted that researchers expressed a need for advanced training courses on the use of library e-resources.

This raises two concerns for KULA:

- The need to establish an effective marketing programme to raise graduate students' awareness of the available services to support their research.
- The need to consider the specific needs of taught graduate students when designing information workshops to develop their information skills.

## **10.5.2 Training and support services**

The qualitative findings revealed that training on how to use the library resources and services is a significant factor that affects the use of the library. This issue was also highlighted in some of the results for the open questions on the questionnaire. Three themes emerged from the qualitative analysis relating to training needs issues: own self-training, supervisor training and module training. These themes will be discussed in Sections 10.5.2.1 to 10.5.2.3, respectively.

### **10.5.2.1 Self-Training**

The qualitative results showed that students' dependence on their personal efforts using trial and error to develop their information skills was confirmed by the majority of PLD, IHD and EED participants across every stage of their research. Although KU libraries provide one-to-one training sessions at the request of students, most of the participants in those disciplines stressed that they usually depended on trial and error methods to develop their information skills. This is in accordance with both Vezzosi (2009) and Bhardwaj's (2012) findings that graduate students' own efforts are the most highly ranked way of learning how to use e-resources, while the librarians and library staff were ranked relatively low.

The quantitative findings revealed that half of the respondents admitted that the library provided information literacy workshops, while the qualitative findings show that few students, and only those who were enrolled full-time, confirmed that they attended those workshops. This might be because the majority of the participants in this study were part-time and so could not request one-to-one sessions or attend the information skills workshops, as most were available only in the daytime. This result reflected an organisational cultural issue related to KU libraries, namely that most offices close at 2 pm. This may act as a barrier to the use of these services by students, particularly part-time students. This finding raises the need for



KULA to organise training sessions in the afternoons and evenings so that part-time students can take advantage of them.

### **10.5.2.2 Supervisor support**

The qualitative results (cross-case analysis) showed that the training role of the supervisor throughout the research stages appeared to affect the role of the library. The supervisors at KU played a major role in training the students to search for information and select their topic in the early stages, as indicated by the majority of the interviewees. The supervisor in some cases took on the role of the library and provided training support to improve the students' information and study skills. Al-Muomen *et al* (2012) noted that the faculty members at KU offered guidance to students on how to conduct literature searches and literature reviews and how to consult information resources. The more they provided guidance, the more the students discovered what e-resources were available. This is in line with the findings of many studies, such as those by Barrett (2005), Kerin *et al* (2004), Serotkin *et al*, (2005) and Tenopir (2003). The results indicate that the students depend on their supervisor as an information skills trainer more than on librarians, particularly in the earlier research stages, which may negatively affect the role of the library. This might be related to the lack of trust in librarians' ability to provide superior support for both graduate students and faculty members and their knowledge of students' subject areas. This resulted in misperceptions about the librarian training role. This is in line with the findings of RIN (2010), namely that researchers have little interest in accessing librarian information skills training, especially in the initial stage of their research. Al-Muomen *et al* (2012) found there was confusion among librarians and academic staff regarding their expected role regarding developing students' information skills.

The results suggest a need for greater collaboration between librarians and academics to enhance the role of the library in providing training support. As Fleming-May and Yuro (2009) stated, liaison librarians working through faculty advisors can be useful in fostering the training role. Increased communication with graduate students is also recommended to develop a trusting relationship and promote this service.

### **10.5.2.3 Module-based training**

The interesting issue that emerged from the qualitative analysis of the perceptions of the graduate students about training on the use of library services is that they received systematic training integrated into the research methods modules provided in their Master's programmes before commencing their research. It was found that the majority of MCD and IHD participants

learnt about the library services through those modules, rather than through the library itself. This is consistent with Al-Muomen *et al*'s (2012) finding that most graduate students at KU thought that the library offered inadequate information skills training, which affected their ability to use the EIRs effectively. More positive views were shown regarding the departmental and faculty training, particularly the courses offered by the LIS department in social science. However, no evidence was provided by EED and PLD participants that they received this type of training through modules in their Master's programmes. This supports the results of the quantitative analysis (Mann–Whitney U tests) that showed science students were more likely to be familiar with the use of specific library services than engineering students and that law students were far less likely to be familiar with them than arts, science and engineering students. This result is in line with the finding of Rabin and Cardwell (2000) that students who attended academic courses in basic information literacy knew more than those who did not. This result indicates that information literacy training was implemented at KU at the departmental level, which had a positive influence on the students' use of the library. However, it seems that some programmes have not launched this course at the graduate level, such as the public law and electrical engineering programmes.

As training programmes are important services provided by university libraries, training strategies should take this into account by identifying the outcomes of the training courses provided and the important role that departmental training plays in addition to librarians' role. Librarians have to leave the library environment and engage in teaching the information literacy courses provided by departments. Collaboration between the library and the departments is crucial, as librarians are responsible for teaching the skills that are a prerequisite for information use and knowledge acquisition and faculty members are responsible for teaching the skills required for subject-specific inquiries and research (Grafstein, 2003).

## **10.6 Personal experience factors**

In the context of this study, the students' experiences with the library services were found to have a significant effect on their use of the library. Four themes emerged from the qualitative analysis (cross-case analysis) relating to the students' personal experiences: the performance of library services, communication experiences, personal feelings and attitudes. These factors are discussed in the following sub-sections (10.6.1 to 10.6.4).

## **10.6.1 Performance of library services**

The qualitative results show that participants across the studied disciplines perceived that the performance of library services was insufficient to meet their needs. Three issues raised by the participants in this study associated with the performance of library services were database services, ILLs and library book collections. These issues are discussed in turn below.

### **10.6.1.1 Library database services**

Regarding the database services, the study findings show that the majority of EED participants complained about the unexpected subscription expiration of the leading databases in their field, which negatively affected their use of the library. Similarly, Hasoomi and Mehraban (2011) found that the major problems encountered by engineering researchers when accessing information were insufficient Internet services and a lack of access to certain databases due to subscription issues. It was also found that the limited subscriptions to subject-specific databases in MCD negatively affected MCD students' use of the library. This is in line with Sethi and Panda (2011), who found that a lack of library subscriptions to more foreign journals in the field of life sciences was one of the main factors that prevented graduate students from selectively using e-resources. This may explain the low proportion (6.9%) of agreement in the quantitative results regarding the responses to the statement that the library provides a wide range of databases in the students' subject areas.

The results tell KULA that the database services, particularly in the fields of science and engineering, need to be improved by increasing the number of subscriptions to meet the graduate students' information needs.

### **10.6.1.2 Library book collections**

In respect of the library book collections, it was found that the majority of IHD and PLD participants complained about the lack of specific books in Arabic relating to their specific topic. This negatively affected their use of the library. This was supported by some indications from the questionnaire's open question analysis, mostly vis-à-vis the arts and law disciplines. Al-Daihani and Oppenheim (2008) and Khan and Bhatti (2012) had similar results, namely that the main problem encountered by law researchers is the unavailability of the required materials and the insufficient provision of library services in the Law Library. This may explain the low agreement proportion (14%) of the quantitative analysis regarding the statement that the library's collection fulfilled their needs.

The findings inform KULA that the library collection of Arabic books, particularly in the Arts Library and the Law Library need to be developed to meet the graduate students' specific needs.

### **10.6.1.3 Interlibrary loan services**

Regarding the students' experiences with the ILL services, they perceived that the long process required for requesting documents that were unavailable in the library affected their use of the library. It was found that the majority of the participants across the studied disciplines complained about the long waiting times for this service, for example, the one month it took for IHD participants to receive requested manuscripts. This is supported by Engel *et al* (2011) and Tucci (2011), who found that the ILL service needs updating; the inability of the ILL service to go outside the normal academic processes might force researchers to ignore the library as a gateway and encourage them to use the Internet instead.

### **10.6.2 Communication experience**

The qualitative results reveal that communication experiences with the library staff were found to be a significant factor associated with the students' interaction with the library services. MCD participants acknowledged that their college library staff made great efforts to provide help when needed. They reflected their appreciation of the librarians for training them or assisting them to locate information resources. It is important to note that all the MCD participants were full-time students who could visit the library during the daytime and contact the library staff in person to fulfil their information needs. The positive image built by the students about the library staff throughout their communication experience encouraged them to use the library's services. In IHD, only full-time participants provided a reflection of their communication experience with the library staff, whether in the Arts Library or with the archival staff at Jaber Al-Ahmed Central Library. However, PLD and EED participants failed to provide any evidence about building good relationships with their college libraries' staff through personal contact. This indicates that communication experience is built only by full-time students at KU because the library staff are available only during the daytime. The results also reflect an organisational culture issue, as most university employees finish work at 2 pm, including professional librarians.

To enhance graduate students' communication with the library staff, it is suggested that KULA should increase the number of professional librarians in the afternoons and evenings so that

part-time students can find librarians when needed. This would help to maintain the bridge between the library and part-time students.

### **10.6.3 Personal feelings**

Positive or negative feelings about the library services provided was found to be another factor related to the students' personal experiences that affected their use of the library. It was found that the majority of EED participants developed negative feelings about the library through their interactions with its services at the first stage due to their lack of knowledge about the services provided, the unavailability of librarians in the evenings and a lack of information resources. All these things negatively affected their use of the library. This is in line with Tucci's (2012) finding that a lack of more subject-specific databases resulted in engineering researchers using Google Scholar as an alternative source to the specialised database. In addition, the majority of PLD participants appeared to have a negative perception due to the poor collection of legal books, particularly books in Arabic. The lack of availability of the desired resources acted as a barrier to their use of the library in the later research stages. Otiike (1999) found that academic lawyers started with the university library and then moved to other sources when the library was unable to provide them with the required materials. In contrast, MCD and IHD participants were found to have positive feelings about their college libraries due to their communication with library staff from the beginning, which enables them to build good relationships with the library.

It was found that the increased demands of the research process in the mid-stage improved the negative image among EED participants, in addition to the supervisor's encouragement. In PLD, this research stage was not associated with improvement, as the lack of books is evident throughout the research process. In contrast, MCD and IHD participants did not express any negative feelings about their college libraries in respect to their personal experiences at the mid-stage. This result indicates that graduate students at KU differ in terms of whether they have a negative or positive image of their college library, based on the extent to which they had personal contact with the library staff and the effectiveness of the services provided. Such negative feelings may have made them reluctant to use the library. The research process is another factor that helped to improve the students' negative feelings from the outset, depending on the extent to which the library could improve its image in the eyes of the students in terms of communicating with staff to meet their needs in the later research stages.

This suggests that librarians who wish to enhance the support role of the library and to better understand the needs of graduate students at each research stage should provide the appropriate support, depending on the demands at each stage. This may help to reduce students' negative feelings about the library.

#### **10.6.4 Personal attitudes**

A positive attitude towards building personal research-related collections from the beginning was also found to be a factor affecting the use of the library in the later stages. It was found that the majority of EED, PLD and IHD participants had positive attitudes toward collecting information resources in the first stage to be used in the later stages, particularly in terms of undertaking background reading. Their attitude towards collecting information resources from the very beginning negatively affected the use of the library in the later stages. This is in line with the findings of many other researchers, such as Fosmire and Radcliffe (2014), who found that engineering students preferred to obtain information from their colleagues and their private collections because they focused on minimising their effort and time. In addition, Tahir *et al* (2010) found that humanities researchers regularly fulfil their information needs by using the library and personal collections. Al-Daihani and Oppenheim (2008) found that personal collections were the most heavily used source for Kuwaiti legal researchers and that a large percentage of them did not use the library.

Librarians' knowledge about the information use and behaviour of the different disciplines is needed to provide graduate students with efficient services that can support them during the later stages of their research.

### **10.7 External information sources**

The qualitative analysis (cross-case analysis) revealed that external sources (Chapter 9 Section 9.2.6) were found to be another significant factor associated with the use of the library by taught graduate students at KU. Four factors related to external sources emerged: non-university libraries; Google search engines; the role of academics and specialists in the field. These factors are discussed in turn below.

#### **10.7.1 Non-university libraries**

Accessible libraries outside the university were found to be an external factor affecting the role of the library across the studied disciplines. Non-university libraries were found to be used by most of the participants in this study to fulfil their topic-specific needs. The inability of KU

libraries to meet the specific needs of graduate students across the studied disciplines acted as a barrier to their use of the library and forced them to find alternative libraries outside the university. The majority of PLD, MCD and IHD participants confirmed this, while a few EED participants indicated that they used external libraries. This might be because they rely on the Internet to obtain journal articles from the authors' home pages and other available databases on the Internet, or they may have personal subscriptions to professional databases, such as *IEEE Xplore*. In the context of this study, the result is partially contradicted by the finding of Vezzosi (2009) regarding life sciences graduate students, as these students greatly depended on their respective libraries to check for relevant information and did not use any other libraries. It is also partially consistent with the results of Otike (1999) and Wu and Chen (2010) regarding humanities graduate students, who tend to use several other ways to obtain documents that are unavailable in their university libraries.

This finding reflects that the provisions of the KU libraries are insufficient to fulfil the specific needs of the taught graduate students. Decision makers at KU might consider implementing a comprehensive provision strategy for the library based on the specific needs of taught graduate students in the Kuwaiti context.

### **10.7.2 Academics' role**

In the context of Kuwaiti higher education, the role of academics was found to be a significant external factor that positively or negatively affected library use. Many studies have highlighted the role of academics as sources of guidance and information for graduate students, such as those by Dingley (2010), Wu and Chen (2010), RIN (2011), Al-Muomen *et al* (2012) and Johnson (2013). It was found that the majority of the participants (PLD, IHD, EED and MCD) in this study acknowledged their dependence on their supervisor as a source of guidance and information more than the library throughout the research stages. They perceived him/her as a knowledgeable person in the field and therefore consulted him/her about what information sources they should use. This finding is in agreement with Steinwachs' (1999) statement that students from high power distance cultures tend to depend largely on their tutor's guidance and are less likely to use information sources that differ from those recommended. This reflects the nature of Kuwaiti culture as any Arab culture and its classification, according to Hofstede (Chapter 2, Section 2.7.5), as a high power distance culture. In this type of society, students accept and obey whatever directions come from those in higher positions of authority, such as supervisors. This is consistent with the findings of this study, as it was clear from the academics' behaviour, particularly in the EED discipline, that they did not debate the selection



of the research topic or the relevant information resources with the students but rather a topic was simply imposed on them.

In the context of this study, the supervisor's role might affect the role of the library negatively when they take on the library's support role and provide the students with the information resources they need. Although there was consistency in the perceptions of graduate students regarding the key role of the supervisor as a source of information and guidance, it was found that differences existed at the departmental level. For example, EED participants perceived the supervisor as the main source of information to be consulted before the library. MCD students depended on the supervisor as a second source of information after the library. However, in IHD and PLD, the supervisor was perceived as a main source of support in terms of alerting students to the existence of relevant materials but did not often provide direct access for them. These findings are in line with those of RIN (2012) that supervisors in the field of law play a role in encouraging the students to be autonomous and provide support whenever needed, while in the field of science (microbiology), the role of the supervisor is to help the students devise their own experiments. In the field of history, supervisors guide students about where to find information. In engineering, guiding graduate students towards finding the type of information sources and helping them to conduct effective and comprehensive information searches was ranked as the top characteristic of supervisors by the graduate students (RIN, 2012).

The results indicated that the role played by the supervisor as an external information source in the context of KU negatively affected the use of the library by the graduate students. Greater collaboration between the faculty members and the library should be introduced to enhance the support role of the library with regard to research.

### **10.7.3 Specialists in the field**

The findings of this study showed that participants across the studied disciplines sought specialist advice or help to find information resources related to their specific topics. They noted that they not only sought their supervisor's support but also that of specialists in their field. This is in accordance with many researchers, such as Leckie *et al* (1996), Otike, (1999), Tahir *et al* (2010) and Satish-Kumar *et al* (2011), who have all emphasised that consulting experts in a researcher's subject area is graduate students' preferred method for gathering information, followed by conversations with colleagues. It was found that experts in the field were a very significant external factor that negatively affected the use of the library. Depending



on specialists in the field as information sources for research could reduce the support role of the library for graduate students.

This finding suggests that if KULA wishes to enhance the support role of the library, they should recruit subject librarians who are experts in the field of research to support graduate students. For example, a legal advisor should be included as a library staff member at the Law Library to provide law students with specialist commentaries to fulfil their professional needs.

#### **10.7.4 Google search engine**

The qualitative results showed that the Google search engine was another external factor that affected the use of the library in the context of this study. It was found that the majority of the EED, PLD and IHD participants depended on Internet tools such as Google to search for information relating to their research topics. The use of Google by graduate students has been investigated by many researchers, such as Cothran (2011), Herrera (2011) and Wu and Chen (2014). As most of the participants in these disciplines were part-time and remote access to the library's online services was unavailable to them, they used the Google search engine as an alternative to the library's e-resources, either from their workplace or at home, to meet their information needs. In this instance, the Google search engine can be considered an external source that is used as an alternative to the library. This result is consistent with the results of a number of studies, such as the one by Baldwin (2009), who found that Google Scholar is working to meet the demand for full-text articles in the engineering discipline. Makri *et al* (2006) and Makri (2007) stated that law researchers often use Google as a starting point to gain an overview of a legal subject, citation or journal article, while Rutner and Schonfeld (2012) reported that the most comprehensive discovery tools available on the open web used by history graduate students are Google and Google Books. These findings were confirmed by Haglund and Olsson (2008), who found that graduate students rely heavily on immediate access to electronic information, use Google for everything and have little contact with the library. The MCD participants did not provide any evidence about their use of Google outside the university library. This might be because all of them were full-time students who could access and use the Internet services provided by the library to use the Google search engine on campus.

As Google Scholar continued to attract most of the graduate students in the context of this study, KULA might wish to provide a link to Google Scholar on its website so that students can access it via the library or their departmental website and then subsequently access materials for which there is a university library subscription. To provide this service for all

types of graduate students, the library should extend its remote access so that part-time students can benefit from this service.

## 10.8 Reflections on the use of Whitley's theory

Whitley emphasises the significance of social and intellectual considerations in shaping the cultural identity of different disciplines. He touches upon the relationship between two concepts—‘mutual dependence’ and ‘task uncertainty’—in the area of scholarly communication but does not discuss the implications of his theory for exploring the role of academic libraries in supporting research in relation to information use and behaviour. Using Whitley's theory to produce my empirical findings has revealed a connection between ‘mutual dependence’ and ‘task uncertainty’ and the area of information use and behaviour. My findings show that adopting a fine-grained level of analysis generates a meaningful understanding of the graduate students' behaviour when using information to support their research. Whitley's (2000) two concepts provided a powerful way to understand and explain the disciplinary differences in shaping the information use and behaviour of the graduate students across the studied cases. This enabled me to treat the information use phenomenon and the cultural identity of the studied fields as mutually shaping and inseparable, which helps in understanding what lies at the heart of shaping the information use and behaviour of the graduate students in order to reconsider the role of the library in supporting their research. This makes a significant contribution to information science. Integrating Whitley's theory into this study facilitated an illustrative exploration of the role of the library in supporting research among the studied disciplines. This might encourage researchers in the field of LIS to adopt similar strategies to gain a deeper understanding of the support role of academic libraries throughout the research stages.

## 10.9 Conclusion

This study has explored several factors that affect the role of the library in supporting graduate students' research in the context of KU. It is worth declaring that studying the information needs, information use and information behaviour of graduate students can help in encouraging the decision makers in higher education to take steps towards enhancing the access to and use of various information resources, particularly e-resources. Such steps require the university administration, academic librarians and academic supervisors to adopt strategic plans that endorse scholarly communication at the graduate level, whereby the students could engage in using various information resources. The findings discussed in this chapter related to three important components affecting the library's support role: disciplinary differences, research

stages and the role of academics. Each played a significant role in shaping the library's role in supporting graduate students' research. The university administration should institute new policies that foster better access to a variety of information resources and services based on the research process and differences between the disciplines. Furthermore, the academic supervisor has to share the responsibility with the library for establishing information literacy programmes to improve the information skills of graduate students by engaging in respectful collaboration with the academic librarian. Academic librarians, academic supervisors and graduate students should work together to foster the support role of the academic library for research.

## CHAPTER 11 – CONCLUSION

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### 11.1 Introduction

Having discussed the findings of this study compared to those of previous studies in the literature, this chapter brings all the aspects of this research together. The aim of this chapter is to provide a summary of the key findings of the research and offer recommendations based on these findings. The contribution to the body of knowledge is discussed, as are the limitations of the study. In addition, suggestions for further research are offered. This chapter begins by reviewing how the main research question was addressed, as described in Chapter 9.

### 11.2 Answering the research questions

The main question in this study was:

- How do KU libraries support graduate students' research?

In order to answer this question, the following sub-questions were identified.

1. What types of resources and services do graduate students use to support their research?
2. What potential roles do librarians play in guiding and supporting graduate students in their research?
3. How do disciplinary differences affect the information use and information behaviour of graduate students during the stages of their research?
4. To what extent can the library meet the information needs of graduate students?
5. What factors affect graduate students' use of the library during their research process?

The study produced empirical data by adopting a mixed methods approach, and the analysis of the data satisfied the study's aims and objectives and enabled the research questions to be answered. The qualitative data analysis revealed significant influencing factors that affect library use and allowed the information use and behaviour of graduate students in the KU context to be elucidated. The study has provided rich descriptions of the use of KU libraries and the disciplinary differences that shape the information use and behaviour of the graduate students. It discussed in detail how the research stages affect graduate students' library use and showed clear evidence of the role played by different disciplinary cultures in the variations of graduate students' information use and behaviour across the studied disciplines. The study discussed how graduate students' information needs affect their library use. Finally, the study

discussed the influence of demographic, academic and cultural factors, among others, on library use in the Kuwaiti context.

### **11.3 Summary of the key findings**

Graduate students at KU provided detailed information about the library's resources and services and the factors affecting their information use and behaviour and overall library use. Based on their perceptions, it can be concluded that:

1. Graduate students in general face problems accessing the library from off campus due to the difficulty of obtaining usernames and passwords from the library. This is because the access policy of KU libraries restricts off-campus access to faculty members (Chapter 9, Section 9.5.1.1).
2. There is evidence of the influence of the library's restrictions on its thesis collections on the use of the library (Chapter 9, Section 9.5.1.1).
3. There is evidence of an ineffective marketing programme for the services offered by the library to graduate students in all the studied disciplines. However, the marketing programmes for the Science Library and the Engineering library at KU are more effective than those for the Arts Library and the Law Library (Chapter 9, Section 9.5.1.3).
4. There is evidence of the role played by supervisors as information skills trainers in some disciplines (Chapter 9, Section 9.5.1.3).
5. There is evidence of the influence of cultural factors on the use of the library, such as language barriers (Chapter 9, Section 9.5.1.1), and financial adequacy (Chapter 9, Section 9.5.1.5).
6. There is a general lack of Arabic resources, particularly books, and subject-specific databases for Arabic language-based disciplines, such as law and the arts (Chapter 9, Section 9.5.1.2).
7. There is evidence of a heavy reliance on external sources of information and dependency on the Google search engine (Chapter 9, Section 9.5.1.4).
8. There is a lack of communication between graduate students and academic libraries in certain disciplines, which leads to a lack of awareness of what the library offers (Chapter 9, Section 9.5.1.2).
9. There are some negative attitudes towards library services, which result in its resources and services not being used (Chapter 9, Section 9.5.1.2).

10. Research stages have a significant influence on the use or non-use of library services (Chapter 9, Section 9.5.2.1).
11. There are differences between the disciplines with regard to information use and behaviour based on the culture of the discipline and graduate students' information needs (Chapter 9, Section 9.5.3.1 and Chapter 9, Section 9.5.4.1).

## **11.4 Contribution of the study**

This study contributes to the established body of knowledge in the following areas.

### **11.4.1 Contribution to library and information science**

A number of studies in the field of LIS have investigated the role of the academic library in supporting graduate students' research. Most were conducted in developed countries and tended to use quantitative or qualitative approaches to examine the topic, while only a few used a mixed methods approach. In recent years, a growing number of studies have examined the information use of graduate students in the context of information seeking behaviour; few studies over the last decade have focused on information use as an isolated phenomenon even in developed countries. For developed countries, there is a gap in the LIS literature regarding the information use and behaviour of graduate students in the academic context. Therefore, the current study has attempted to fill this gap. This study is novel because it focuses on the information use and behaviour of graduate students as a single phenomenon and investigates the support role of academic libraries in developing countries like Kuwait.

From a methodological perspective, the current study has demonstrated that using a mixed methods approach to examine the role of the library in supporting research based on studying the information use and behaviour phenomenon leads to a deeper understanding of how graduate students use libraries in the developing world, particularly in Arab countries. By nature, this involves cultural differences. Therefore, the examination of newly explored cultural factors, such as the language barrier and financial adequacy, adds to the existing body of knowledge about library use. In addition, the study adds to our knowledge about the influence of the research stages on library use.

This study also adds to the knowledge base regarding library use by law graduate students. As there is a dearth of literature regarding the information use and behaviour of these students, this study is unique because it attempts to fill this gap. The study has identified similarities and differences in comparing the case of developing countries, such as Kuwait, to Western

countries. More specifically, the travelling behaviour of KU law graduate students to seek information for their research (Chapter 9, Section 9.3.3) is considered a unique characteristic of the law discipline compared to UK as a Western country, as law researchers in this country no longer have to travel to the information source, since it can be delivered digitally to their desktop, thus this contributing to the existing body of knowledge.

Although the literature provides clear evidence that travelling behaviour is part of the nature of the history discipline, this study added to the knowledge about travelling overseas to seek advice from experts in the field of Islamic history (Chapter 9, Section 9.3.3), which is regarded as a unique characteristic compared to UK as a Western country. It is therefore argued that the study represents an original contribution in the area of information use and behaviour and discusses important and emerging issues in the area.

#### **11.4.2 Contribution to methodology**

The originality of this study is in the methods employed to obtain a deeper understanding of the phenomenon (the role of academic libraries in supporting graduate students' research). The literature reviewed indicates that most of the methods previously used were either quantitative or qualitative in nature. The methodological contribution of the current study is in the use of the mixed method approach (quantitative and qualitative) within a single case study. The implications of Whitley's theory and case study approach together with the thematic analysis method to gain a deeper understanding of the support role of the library for graduate students is exceptional. This might encourage other researchers in the field of LIS to use similar strategies while being aware of the limitations of Whitley's theory, as discussed later in Section 11.5.5. The use of a combination of qualitative approaches (case study, thematic analysis and Whitley's theory) added originality to the methodological contribution of the study. The combination of qualitative approaches increased the validity of the study and enhanced its contribution, as this may be the first time that such a consistent methodological technique has been employed to study information use and behaviour.

The advantage of the methodological contribution of this study is associated with the use of Whitley's theory, to identify the different cultural identities of the studied disciplines that have a significant impact on shaping the information use and behaviour of the graduate students in those disciplines. This in turn shapes the students' interactions with the library's resources and services. The researcher therefore confirmed the possibility of using Whitley's theory as an

analytical approach in the field of LIS, as it was previously used by Fry (2006a; 2006b), Fry and Talja (2007), Al-Aufi and Lor (2012) and Fry *et al* (2015).

Finally, the use of the theoretical framework technique to investigate the studied topic is a useful approach when attempting to explore the information use and behaviour of graduate students. Using a multi-method technique (Whitley's theory, a case study, a thematic analysis) in the qualitative phase of the present study was definitely novel. Previous studies focused on studying one aspect of the supportive role of the library, which is the use of its resources and services. The multi-method technique enabled the researcher to focus on different aspects associated with the research phenomenon: the cultural context of the disciplines, the information use and behaviour of the graduate students and the influences of the research stages on students' use of the library. This would have been much more difficult to explore when had a single research approach been used. Therefore, employing multi-method techniques and focusing on multiple subjective dimensions constituted a completely new approach.

#### **11.4.3 Contribution to Arabic literature**

The literature review revealed a gap in the Arabic literature regarding the role of academic libraries in supporting research, particularly with regard to graduate students as a specific user group. Very little research has been conducted to investigate the support role of academic libraries in research in the Arab world. Kuwait in particular lacks studies on the support role of academic libraries for research. Studying the literature dealing with Kuwait revealed that only two empirical studies have been conducted in the country—those by Hamade and Al-Yousef (2010) and Al-Muomen *et al* (2012), which are directly related to the topic of the current study. The latter study seems the best and investigates the information-seeking behaviour of graduate students at KU and the factors influencing the patterns of that behaviour using a mixed methods approach. The study found various factors significantly influence the graduate students' information-seeking behaviour, with cultural issues ranked as the major factor rather than the discipline-specific culture that shaped the information use and behaviour of the graduate students in the current research.

The other highly relevant study conducted by Hamade and Al-Yousef (2010) investigated the use of information by LIS graduate students using bibliometric methods. The study found that a lack of awareness and competence with regard to library use might explain the low utilisation of its e-resources and services by graduate students. It can be seen that there is a lack of research



in the published Arabic literature relating to the information use and behaviour of graduate students' in the context of Arab countries.

Based on the lack of available information about the support role of academic libraries with regard to research in the Arabic context, the current study is considered unique because it attempts to fill the gap in the literature of Arab countries. The study was designed to focus on some areas that have not been explored so thoroughly in the LIS literature of the Middle East, that is, information use and behaviour. The study is of specific worth because it focuses on information use and behaviour of graduate students as a particular user group in Kuwait. It provides a detailed understanding of the information use and behaviour of graduate students based on the cultural context of disciplines, which have not been investigated previously in the Arabic world. The study also provides insights into how graduate students within specific disciplines use the library resources and services for their research. It explores other factors that influence the use of the library by graduate students, such as personal experience (e.g. personal feelings, personal attitudes and communication experience) and external factors (e.g. specialists in the field and non-university libraries) that have not been examined before in the Arabic literature.

#### **11.4.4 Contribution to the Kuwaiti context**

This study is also the first research conducted in Kuwait that focuses on exploring the different cultural contexts of the disciplines that shape the information use and behaviour of graduate students, in addition to investigating the support role of academic libraries for these students during their research stages. The study provides detailed information about the differences between the studied disciplines with regard to information use and behaviour and what lies at the heart of the graduate students' information behaviour, as well as the factors that affect their use of the library in the Kuwaiti context. This study attempts to fill the gap in the literature regarding the role of academic libraries in supporting research, particularly for graduate students as a specific user group in Kuwait. In addition, many hypotheses related to the relationship between graduate students and the use of KU libraries emerged from the analysed data, as discussed in Chapter 9 (Section 9.5.5) and can be considered as knowledge contributions that need to be tested in further research. These hypotheses are:

- There is a relationship between the range of access points provided by the library and the use of its resources and services by the graduate students.

- There is a relationship between the level of restrictions the library places on access to its services and the use of its collection by the graduate students.
- There is a relationship between the performance of library services and the graduate students' library use.
- There is a relationship between the availability of remote access for the graduate students to access the library's online resources from home and their use of its resources and services.
- There a relationship between the degree of publicity about library services and the use of its training sessions by the graduate students.
- There is a relationship between the availability of other accessible libraries on which the students can depend to meet their needs and their use of the university library.
- There is a relationship between the students' dependency on specialists in the field as an external source to meet their information needs and their use of the library resources and services.
- There is a relationship between the students' financial capability to buy the information resources they need and their use of the library.

## 11.5 Limitations of the study

Several limitations affected the final results of this study. These are discussed below.

### 11.5.1 Linguistic limitations

Working in a multilingual way during the entire study was a challenge (Chapter 3, Section 3.16), as the researcher is a non-native English speaker. The need to read a massive amount of literature in English, express ideas and arguments in academic English and become familiar with new vocabulary and new concepts essential to the research topic in a foreign language was not easy. For example, the term 'information use' is problematic as it is not well defined in LIS and overlaps with the concept of information-seeking behaviour in developed countries. In a developing country like Kuwait, this concept lacks a definition and is not commonly used. This caused the researcher some difficulty when trying to explain the concept to the interviewees to gather their responses about their information use and behaviour.

Another linguistic limitation (Chapter 3, Section 3.11.2.2) was the need to translate Arabic text into English or vice versa when preparing the research instrument (survey questionnaire or semi-structured interview) for the data collection. The questionnaire and interview were

administered in Arabic and required the translation of the collected data into English. During the translation process, the meaning of some data may be lost because concepts in one language may be interpreted differently in another and thus may reduce the validity of the data. Therefore, a native Arabic speaker who specialises in the English language was consulted to confirm the accuracy of the translation and to validate the meaning of the data collected. In addition, the process of translating the data consumed a large amount of time and energy due to the need to double check the meaning and interpretation, as this study is a small scale one that had to be completed within a limited period of time.

### **11.5.2 Sampling limitations**

Selecting a qualitative sample of 48 students from four academic fields and dividing the selected target population into strata (stratified sample) based on the stages of their research (e.g. first stage, mid stage and final stage) was problematic (Chapter 3, Section 3.9.2). The iterative nature of research in some of the selected disciplines (e.g. Islamic history and public law) where the writing-up stage proceeds in parallel with the data analysis made it difficult for the researcher to identify in which stage the participants are; therefore, the researcher merged them into one stage for all the studied disciplines termed the mid stage, which may also affect the findings of the study. However, applying various qualitative techniques in general and using the case study approach in particular supports the sampling logic and findings of this study, as seeking insights into the studied phenomena was the aim of this study rather than identifying a representative sample of the graduate student population or generalising the findings.

### **11.5.3 Generalisability limitations**

In the current study, generalisability is not possible, as the qualitative approach used is a single case rather than multiple cases. The findings of this study might only be generalised to the university context in general; it cannot be assumed that all universities in Kuwait have the same circumstances unless further research is carried out. The findings of this research cannot be generalised to a wider population at KU or to other Arabic or international contexts because:

- The study was limited to graduate students who were enrolled in the CGS at KU. Graduate students at private universities in Kuwait may have different ways of accessing and using information. Therefore, a future research project could also include graduate students at private universities in Kuwait as a multiple case study to extend the generalisability of the findings to graduate students in the Kuwaiti context.

- Although the study was conducted at KU as an example of an academic setting in a developing country, the findings cannot be generalised to graduate students in all Arabic countries, as the Arabic World has a wide diversity of cultural and socio-economic settings that might influence the information use and behaviour of graduate students.
- The study limited its examination to graduate students in four disciplines at KU. Students in other disciplines may have similar or different patterns of information access and use. A further research project might include graduate students from other disciplines to ensure that the current findings can be generalised to a wider population at KU.

#### **11.5.4 Data collection limitations**

When collecting data via the questionnaire (Chapter 4, Section 4.2.4), some of the wording might be interpreted in different ways; for example, the option ‘regularly’ might mean every day or once a year, and the option ‘frequently’ might mean once a week. This may affect the reliability of the data. When using this scale in another study, these two options should be collapsed into one option, which is ‘regularly’, to avoid affecting the reliability of the data.

In addition, interviewing electrical engineering students was a frustrating and puzzling experience (Chapter 5, Section 5. 2), as most of them work for companies and so tend to be busy and not to have time to be interviewed. This makes finding the required sample of electrical engineering interviewees problematic. In addition, the researcher was unable to obtain the same richness and depth of detail information from them as from the students in the other disciplines. This may be because most of the students carrying out a non-thesis project have to complete the project in a short period of time compared to students in the other studied disciplines. This may affect the findings of this study when comparing electrical engineering with the other studied disciplines.

#### **11.5.5 Limitations of Whitley’s theory**

Regarding how Whitley’s theory contributes to understanding the phenomenon under investigation, the researcher has noticed the following limitations in her data analysis (Chapters 5–9)

First, the concepts of ‘task uncertainty’ and ‘mutual dependence’ in Whitley’s explanatory framework are interrelated and so allow us to conclude that the electrical engineering field has a high degree of ‘mutual dependence’ and a low degree of ‘task uncertainty’ compared to the Islamic history field (Chapter 3, Section 3.11.2.3). However, these two concepts cannot be measured in absolute terms because the relative nature of Whitley’s framework makes it difficult to measure their level in any specific field. This explanatory framework is less meaningful when applied to a single intellectual field because it will provide limited insights only. When used for comparative case studies, it will be highly functional. The absence of a definitive measure for the level of the two concepts makes it difficult for the researcher to characterise the fields that fall somewhere between the dichotomous combinations of Whitley’s theory in relation to each other, such as multidisciplinary fields (e.g. microbiology) and interdisciplinary fields (e.g. public law). Whitley’s theoretical framework as an analytic approach worked well for describing the patterns of information use and behaviour observed within the electrical engineering and Islamic history fields but was insufficient in providing an illustrative explanation for the patterns the researcher observed in the microbiology field and the public law field.

Second, when designing the interview guide, the researcher did not include questions about the domain boundary (Chapter 3, Section 3.11.2.1.2) that can help in developing a structural understanding of the differences in terms of the dependency characteristics between the four case studies. Theoretical and methodological characteristics can create intellectual spaces for cross-domain collaboration, as the researcher observed in the microbiology field.

Third, Whitley drew upon a limited number of traditional disciplines from applied sciences, social sciences and the humanities, such as physics, chemistry and philosophy, in developing his theory. The absence of more modern fields in his theory is noticeable, except for business studies. For example, electrical engineering and public law are not included. This is considered a limitation of this theory when used to examine the differences between the disciplines in terms of information use and behaviour in this study.

## **11.6 Recommendations**

Based on the findings and conclusions of this study, KU library may consider the following recommendations presented in Sections 11.6.1 and 11.6.2, respectively.

## 11.6.1 General recommendations

### 1. Recommendation related to information needs

- The information needs of graduate students in different disciplines might be assessed. This could help in making decisions about what resources and services should be offered to graduate students according to their needs and in designing workshops to develop the students' information skills based on their discipline-specific needs. This could be achieved by conducting online surveys via students' university e-mail accounts or via other methods, such as focus groups with graduate students or assessments by academic staff.

### 2. Recommendation related to availability

- The physical ILL service at KU might be upgraded to an online service that is available 24/7 so that students can use this service, particularly those who cannot visit the library during the daytime.
- A link between KU libraries' websites and other academic institutions in the private or public sectors might be created, such as the Public Authority for Applied Education and Training (PAEET) and KISR, to enhance resource sharing locally. This can be achieved by developing a resource-sharing strategy that can help by providing the students with the resources they need within their university library.
- An institutional repository for the research collection at KU might be created. This would provide digitised research collections—such as theses or dissertations—that can be read online and are free of charge. This would help to reduce the amount of photocopying required and ease the borrowing restrictions placed by the library on its thesis collection that hinders its effective use by students.
- The library collection at KU might be expanded; particularly Arabic books for those disciplines that tend to depend on books for research. The number of subscriptions to e-journal databases might also be increased. This might be achieved by adding Arabic and non-Arabic databases to the list of databases subscribed to by KULA.

### 3. Recommendation related to accessibility

- Access to the library might be increased by extending its opening hours and hiring additional staff to work in the evenings to meet the needs of graduate students who can only visit the library late in the evening.

- The accessibility of KU library might be improved by extending the remote access services and facilitating the process of obtaining passwords and user names for graduate students.
- KU library might wish to provide a link to Google Scholar on its website so that students can access it via the library or their departmental website and then subsequently access materials for which there is a university library subscription.

#### **4. Recommendation related to promotion of services**

- More effective promotion of library services should be considered, which might be achieved by developing a marketing strategy that can lead to a greater awareness of the resources and services offered by the library. It could include launching virtual tutorials on the library's website about the specific services provided by the library to support graduate students' in their research.
- Information skills training for graduate students might be provided, particularly in the initial stage of their research, and possibly information management skills training to support graduate students in a tailored way throughout the different research stages within the different disciplines.

### **11.6.2 Subject-specific recommendations**

The cultural differences between the disciplines might be considered when designing services to support the students' research in the four studied disciplines.

#### **Electrical engineering field**

- The Engineering Library might redesign its services to be more digitally based (e.g. subscribe to more centralised field-base databases and launch online ILL services) to fulfil the students' information needs, as the culture of the electrical engineering field (high 'mutual dependence') strongly influences students' preferences to access and use e-resources.
- The Engineering Library might need to extend its remote access services and facilitate the process of obtaining passwords and user names for electrical engineering graduate students, as the research culture of this field that is based on lab work shapes the students' preference to access and use the library remotely.

### **Microbiology field**

- The Science Library might provide a link to the Health Sciences Library or the KISR library through its website to provide the students with the resources they need at the university library. The diffusion of the microbiology field across diverse specialist areas as a consequence of its medium degree of ‘task uncertainty’ leads the students to use databases of other fields to fulfil their subject-specific needs.
- The Science Library might extend its subscription licensing arrangements with Science Direct to meet the students’ information needs, as the culture of the microbiology field (moderate degree of ‘mutual dependence’) highly influences the students’ preference to access and use multi-disciplinary databases, such as Science Direct.
- The Science Library might need also to extend its remote access services and facilitate the process of obtaining passwords and user names for microbiology graduate students, as the research culture of this field that is based on lab work shapes the students’ preference to access and use the library remotely.

### **Islamic history field**

- The Arts Library might need to develop its historical Arabic book collection to include historical e-books to encourage Islamic history students to use IT, as the culture of this field (high ‘technical task uncertainty’) strongly influences students’ dependency on books as a main source of information.
- The Arts Library and the Jaber Al-Ahmed Central Library might establish links to archival institutions, such as museums, in the Islamic world to meet the Islamic history students’ information needs at the university libraries.
- The Arts Library might provide translation services for foreign language historical resources available in its collection to support the graduate students’ research. The use of the spoken language in this field which is Arabic, shapes the students’ need to translate other foreign languages resources to meet their information needs.



## **Public law field**

- The Law Library might subscribe to other local databases that provide up-to date legislation and decisions and that have direct links to the courts to fulfil the students' information needs, as the culture of the public law field (high 'technical task uncertainty') strongly influences control over local resources and the use of local databases as sources of up-to date primary information.
- The Law Library might recruit a legal advisor as a library staff member to fulfil the students' professional information needs, as the culture of the public law field (high 'technical uncertainty') strongly influences the students' independence in conducting their research. Therefore, they need to personally contact legal experts to make sense of their results in 'specialists' commentary'.
- The Law Library might develop specific legal book collections to meet the information needs of the graduate students in public law, as the culture of this discipline (high 'technical task uncertainty') shapes the students' dependence on books as the main source of information.
- The Law Library might establish links with governmental bodies by linking their legal departments with the library to meet the public law students' information needs within the university libraries, as the culture of this field (high 'technical task uncertainty') shapes the students' use of legal information from a wide variety of sources.

### **11.7 Future research**

Based on the findings and conclusions, this research proposes the following areas for future study:

1. This research investigates the information use and behaviour of Master's students at KU as a specific user group. Further studies should be conducted to investigate the information use and behaviour of PhD students as a specific user group. At the time when this study was conducted, KU only offered PhD programmes in mathematics, chemistry and medicine, in which only a small number of students were enrolled.
2. The study was limited to graduate students who were enrolled in the CGS at KU. Further research could consider graduate students from private universities in Kuwait. This would help to establish whether the institution's status could be a factor in shaping

the information use and behaviour of the graduate students. At the time of conducting this research, KU was the only higher educational institution that offered graduate programmes in Kuwait.

3. The culture of each discipline may have an impact on the information use and behaviour of the graduate students. The study limited its examination to four disciplines, and further research should be conducted to investigate the impact of the culture of other disciplines at KU on the information use and behaviour of graduate students.
4. Other studies could be conducted to investigate the impact of the unavailability of subject-specific Arabic databases on the information use and behaviour of the graduate students at KU whose discipline is taught in Arabic such as history discipline.
5. Further studies to investigate the cultural factors (e.g. financial adequacy and language barriers) that impact the information use and behaviour of the graduate students may be needed. Such studies may help in developing useful recommendations about changing the students' attitudes towards using the library resources and services.
6. The role played by the supervisor may have an impact on the information use and behaviour of graduate students at KU. Further research should be conducted to investigate the supervisor's influence on the information use and behaviour of graduate students, considering how existing roles and responsibilities of the supervisor and the associated academic context and culture impact the students' information use and behaviour.
7. The travelling of public law graduate students' overseas to information sources may impact their information use and behaviour. Further research should be conducted to investigate how this influences the information use and behaviour of public law students at KU. Such studies may help to clarify the reasons behind this behaviour and to develop recommendations about changing the students' attitudes towards such travel.
8. Integrating information skills and library skills training into modules by the academic programmes (e.g. biological science and history) impact the information use and behaviour of the graduate students at KU. Further research should be conducted to investigate to what extent information literacy education can add value in terms of the

use of the library by graduate student when conducting their research. Such studies may help in developing useful recommendations about the contributions of library staff in these modules to enhance the supporting role of KU libraries for research.

## **11.8 Concluding remarks**

This research has provided a clear picture for decision makers at KU about the culture of the academic disciplines and their influence on the information use and behaviour of graduate students. In light of the identified factors that act as barriers hindering the students' use of the university library, decision makers can develop a strategy that considers the demands of the research stages and the cultural differences between the disciplines that would encourage the students in specific disciplines to utilise the library resources and services more effectively to support their research. This may help to enhance the students' research abilities, improve the quality of Master's and doctoral research and increase the dissemination of research by KU. This study should not only be regarded as a significant contribution to the body of knowledge but also as an important step in the ongoing process of understanding the information use and behaviour and information needs of graduate students at KU so that the university can become a world-class teaching and research institution.

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## APPENDICES

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## Appendix 1: The search strategy

The screenshot displays the EBSCOhost search interface. The search query is 'post-graduate students AND information'. The search results are displayed in a list format, showing two results. The first result is '31. Post-graduate students and learning environments: Users' perceptions regarding the choice of information sources.' by Saiti, Anna, Prokopiadou, Georgia. The second result is '32. Evaluation of Use of Consortium of e-Resources in Agriculture in Context of Kerala Agricultural University.' by Francis, A. T. The interface includes a search bar, a search button, and a 'Refine Results' sidebar on the left. The sidebar shows the current search query and the limits applied: 'Publication Date: 20050101-20141231', 'Full Text', 'Scholarly (Peer Reviewed) Journals', and 'Image Quick View'. The search results are displayed in a list format, showing two results. The first result is '31. Post-graduate students and learning environments: Users' perceptions regarding the choice of information sources.' by Saiti, Anna, Prokopiadou, Georgia. The second result is '32. Evaluation of Use of Consortium of e-Resources in Agriculture in Context of Kerala Agricultural University.' by Francis, A. T. The interface includes a search bar, a search button, and a 'Refine Results' sidebar on the left. The sidebar shows the current search query and the limits applied: 'Publication Date: 20050101-20141231', 'Full Text', 'Scholarly (Peer Reviewed) Journals', and 'Image Quick View'.

Screen shot: using limiters to search the LLIS database.

## Appendix 2-A: Self-administered Questionnaire 1

**Participant consent:** (Put a ✓ against the statement if you agree)

I have read the above statement, and I agree to participate as a graduate student in this project.

### **Part One: Participant details**

Degree programme:  Masters  PhD

College: .....

Department: .....

Academic year:  first  second  third  fourth  over fourth  graduated

You are:  Full-time student  Part-time student

Personal Data:

Age:  under 26  26–35  36–45  46–55  56–65  over 65

Gender:  Male  Female

### **Part Two: Questions**

Answer the following questions by putting a ✓ against one of the following:

1. Strongly agree  2. Agree  3. Neutral  4. Disagree  5. Strongly disagree.

Your answer should reflect your clear and frank opinion.

**First section:** Use of the library and the quality of its provisions

	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
1. The library is a quiet place and encourages me to do my research work.					
2. There is enough space to do my research work in the library.					
3. I have used the library resources and services in person during this academic year.					
4. The library facilities in general are satisfactory.					
5. The library has all the research materials I need.					
6. I rely heavily on the interlibrary loan services.					
7. The photocopy services are reliable.					
8. The faculty members encourage graduate students to use the library in their course work.					

**Second section: Types of library materials to support research**

	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
9. Resources that meet my needs are available in:					
a. Print formats					
b. Electronic formats					
10. The library subscribes to a wide range of databases in my field.					
11. The library provides me with up-to-date books in my field.					
12. The library offers audio-visual resources relating to my field.					
13. Computers are available whenever I need them.					
14. The computer facilities meet my needs.					
15. Internet services are efficient as an information resource.					
16. There is a variety and balance of information resources in my field.					

**Third section: Users' satisfaction with library resources and services**

	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
17. The library hours are convenient to meet my research needs.					
18. The librarians are experienced in the borrowing system.					
19. The library staff knows about my special subject.					
20. The librarian assists with my enquiries about information and resources.					
21. The library instructions are helpful in using the library.					
22. The books I need are available on the shelves.					
23. The library collection meets my needs.					
24. The library has enough staff.					
25. Library staff/librarians are helpful.					
26. I am familiar with the use of the following types of services in the library:					
a. Document delivery					
b. Online catalogue					
c. Information desk					
d. E-journals					
e. Databases					
f. E-books					



**Section Four: Role of the library in supporting research**

	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
27. The library is regarded as a storehouse for books only.					
28. The library offers information literacy workshops for graduate students.					
29. The services offered by the academic library are publicised to the students.					
30. The library website is helpful.					
31. The librarian is always available whenever I need help.					
32. There is collaboration between the librarians and faculty members.					

**Part Three:**

33. What makes you dissatisfied with the university library services?

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34. What is your suggestion to improve the university library services in the future?

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If you are willing to take part in an interview for the same purpose, please supply the following:

Name: .....  
 Phone number: .....  
 e-mail: .....

Thank you for your cooperation,  
 Wafaa Al Motawah  
 If you have any questions, please call me at  
 07551949136 or  
 e-mail me at [lip08waa@shef.ac.uk](mailto:lip08waa@shef.ac.uk)

## Appendix 2-B: Self-administered Questionnaire 2

**Participant consent:** (Put a ✓ against the statement if you agree)

I have read the information provided about the project. I understand how the data collected will be used, and I agree to participate as a postgraduate student in this study.

### **Part One: Participant details**

#### **Academic data**

College:

Engineering       Science       Arts       Law

Degree programme:

Masters       PhD

Academic year:

first     second     third     fourth     over fourth

You are:

Full-time student       Part-time student

#### **Personal data**

Gender:

Male       Female

Age:

under 26     26–35     36–45     46–55     56–65     over 65

#### **Library visits**

On average, how often do you visit your college library?

Regularly     Frequently     Occasionally     Rarely     Never

#### **Part Two: Questions**

Answer the following questions by putting a ✓ against one of the following:

1. Strongly agree     2. Agree     3. Neutral     4. Disagree     5. Strongly disagree

Your answer should reflect your clear and frank opinion.

**First section:** Use of the library and the quality of its provisions.

	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
1. The library is a quiet place and encourages me to do my research.					
2. There is enough space to do my research in the library.					
3. The library facilities in general are satisfactory.					
4. The library has all the research materials I need.					
5. I rely heavily on the interlibrary loans services.					
6. The photocopying services are reliable.					
7. The faculty members encourage graduate students to use the library in their coursework.					

**Second section:** Types of library materials used to support research.

	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
8. The library's print materials are very important in fulfilling my needs.					
9. The library's electronic materials are very important in fulfilling my needs.					
10. The library subscribes to a wide range of databases in my field.					
11. The library provides me with up-to-date books in my field.					
12. The library offers audio-visual resources relating to my field.					
13. Computers are available whenever I need them.					
14. The computer facilities meet my needs.					
15. The Internet service is efficient as an information resource.					
16. There is a variety and balance of information resources in my field.					

**Third section:** Users' satisfaction with library resources and services.

	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
17. The library hours are convenient for fulfilling my research needs.					
18. The librarians are experienced in the borrowing system.					
19. The library has specialist librarians who know about my special subject.					
20. The reference librarian assists with my enquiries about information and resources.					
21. The library instructions are helpful to me when using the library.					
22. The books I need are available on the shelves.					
23. The library collection fulfils my needs.					
24. The library has enough staff.					
25. The library staff/librarians are helpful.					

**Fourth section:** Familiarity with library services.

	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
26. I am familiar with how to use the following types of services in the library:					
a. Document delivery					
b. Online catalogue					
c. Information desk					
d. E-journals					
e. Databases					
f. E-books					

**Fifth section:** Role of the library in supporting research.

	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
27. The library offers information literacy workshops for graduate students.					
28. The services offered by the academic library are publicised to the students.					
29. The library website is very helpful for me in my field.					
30. The librarian is always available whenever I need.					

**Part three**

31. What do you particularly value about the university library services?

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32. What makes you dissatisfied with the university library services?

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33. Do you have any suggestions for improving the university library services in the future?

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If you are willing to take part in an interview for the same purpose,  
please supply the following:

Name: .....  
Phone number: .....  
E-mail: .....

Thank you for your cooperation,  
Wafaa Al Motawah  
If you have any queries, please call me at  
07551 949136 or  
e-mail me at [lip08waa@shef.ac.uk](mailto:lip08waa@shef.ac.uk).

## Appendix 3: Kuwait University/College of Graduate Studies permission

KUWAIT UNIVERSITY  
COLLEGE OF GRADUATE STUDIES



جامعة الكويت  
كلية الدراسات العليا

Date : .....

التاريخ: .....

Our Ref : .....

الإشارة: .....

٢٠٠٩/٥/١٤

### إلى من يهمه الأمر

تقدمت الطالبة/ وفاء المطاوعة بطلب إلى كلية الدراسات العليا وأفادت بأنها تحضر رسالة دكتوراه في جامعة شيفيلد بالمملكة المتحدة حول "دور المكتبات في جامعة الكويت في دعم أبحاث طلبة الدراسات العليا".

وترغب بتوزيع استبانة على الطلبة لمسح آرائهم حول هذا الأمر لذا يرجى التكرم بتقديم التسهيلات المطلوبة.

وتفضلوا بقبول وافر التحية والاحترام،،،

أ.د. فيصل عبدالله الكندري

  
العميد المساعد للشؤون الطلابية  
كلية الدراسات العليا  
العميد المساعد للشؤون الطلابية

## Appendix 4: Results of the reliability analysis

To see if the questionnaire items really belong to the scale, a process called item analysis was followed. A reliability analysis of the items measured using a Likert-type scale was conducted, and the internal consistency reliability analysis (Cronbach's alpha) of the items was measured using a five-point Likert scale. Corrected items-total correlation and alpha if an item is deleted were examined, following the procedure of De Vaus (2007).

The internal consistency reliability for the scores for the use of the library of the sample was acceptable (Cronbach's alpha =0.74). The corrected item-total score correlations for the eight items range from 0.29 to 0.58.

The resulting Cronbach's alpha of 0.86 for the type of materials suggests a reasonable level of reliability. The corrected item-total score correlations are relatively strong, ranging from 0.42 to 0.70. Removing any of the eight items will reduce the level of internal consistency among them.

The resulting Cronbach's alpha of 0.82 for the nine items of user satisfaction was acceptable. The corrected item-the total score correlations for these items range from 0.18 to 0.62. Removing any of the nine items from the scale will increase the internal consistency among them.

For familiarity with the use of library services, the internal consistency of the six items was acceptable (Cronbach's alpha =76). The corrected item-total score correlations for these items are relatively strong, ranging from 0.54 to 0.55. Removing any of the six items will reduce the level of internal consistency among the items.

The internal consistency reliability for the score of the librarian's role was acceptable (Cronbach's alpha = 0.75). The corrected item-total score correlations range from 0.27 to 0.56. Removing any of the six items will increase the internal consistency among them. For this reason, question 27 will be removed from the scale.

## Appendix 5: Results of data factor analysis

Factor analysis was performed to test the construct validity using principal component analysis (PCA) with a minimum eigenvalue of 1 as the cut-off point for the total factor. A scree plot was used to support the extraction of the components following the procedure of De Vaus (2007).

The value of KMO, which is 0.667, indicates that factor analysis is useful with the first subscale data (use of the library). It comprises eight variables, which are Q1, Q2, Q3, Q4, Q5, Q6, Q7 and Q8. PCA using a one factor solution resulted in a single factor, accounting for 38.27% of the variance. The eigenvalue was 3.06, with the scree plot supporting the extraction of one component factor.

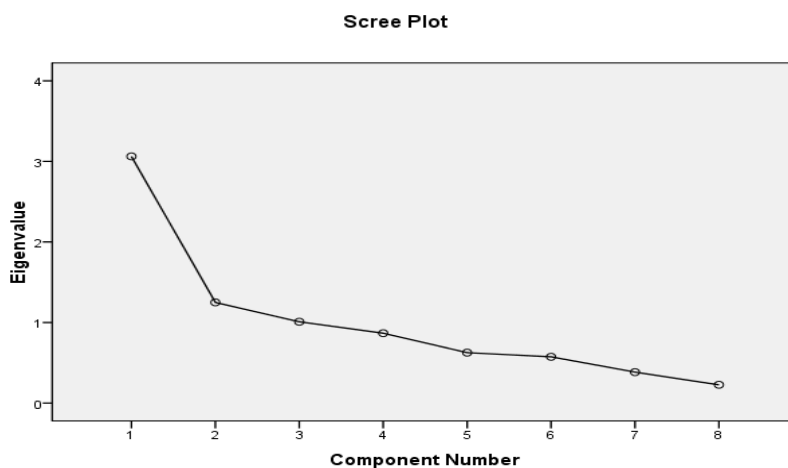


Figure 3.6: Scree plot for the eight items of library use and the quality of provision score.

The value of KMO, which is 0.846, indicates that factor analysis is useful with the second subscale data (the types of library materials). It comprises eight variables, which are Q9, Q10, Q11, Q12, Q13, Q14, Q15 and Q16. PCA using a one factor solution resulted in a single factor accounting for 48.53% of the variance. The eigenvalue was 4.36, with the scree plot supporting the extraction of one component factor.



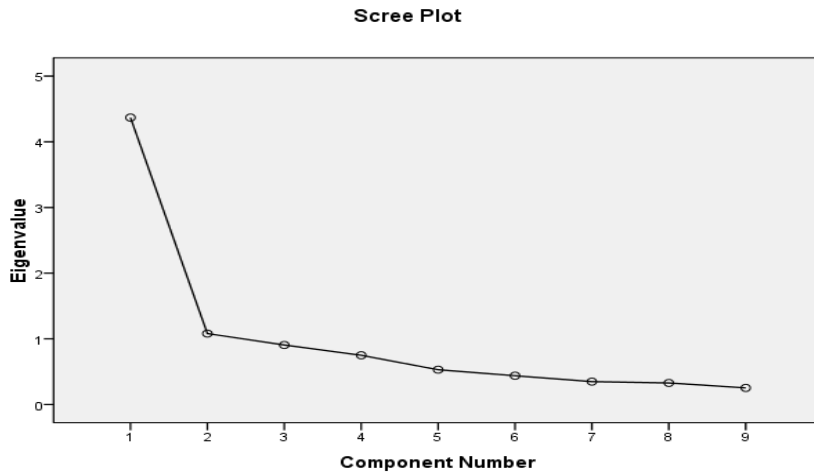


Figure 3.7: Scree plot for the eight items of the types of library materials score.

The value of KMO, which is 0.759, indicates that factor analysis is useful with the third subscale data (user satisfaction). It comprises nine variables, which are Q17, Q18, Q19, Q20, Q21, Q22, Q23, Q24 and Q25. PCA using a one factor solution resulted in a single factor accounting for 44.88% of the variance. The eigenvalue was 4.04, with the scree plot supporting the extraction of one component factor.

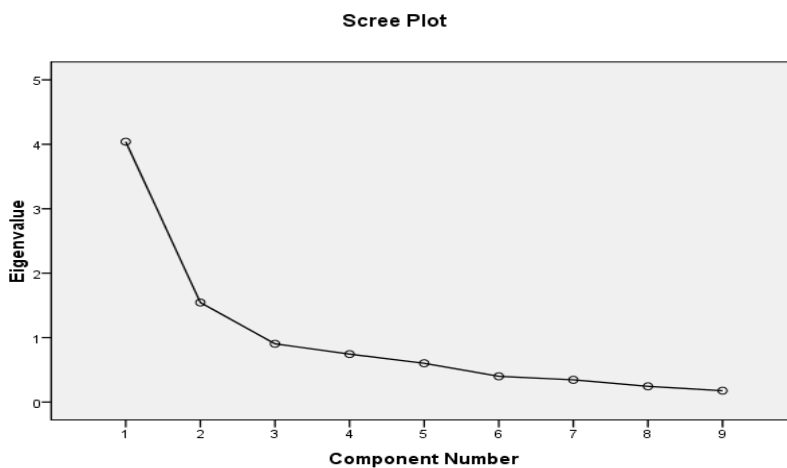


Figure 3.8: Scree plot for the nine items of the user satisfaction score.

The value of KMO, which is 0.777, indicates that factor analysis is useful with the fourth subscale data (familiarity with library use). It comprises six variables, which are Q26a, Q26b, Q26c, Q26d, Q26e and Q26f. PCA using a one factor solution resulted in a single factor

accounting for 45.87 % of the variance. The eigenvalue was 2.75, with the scree plot supporting the extraction of one component factor.

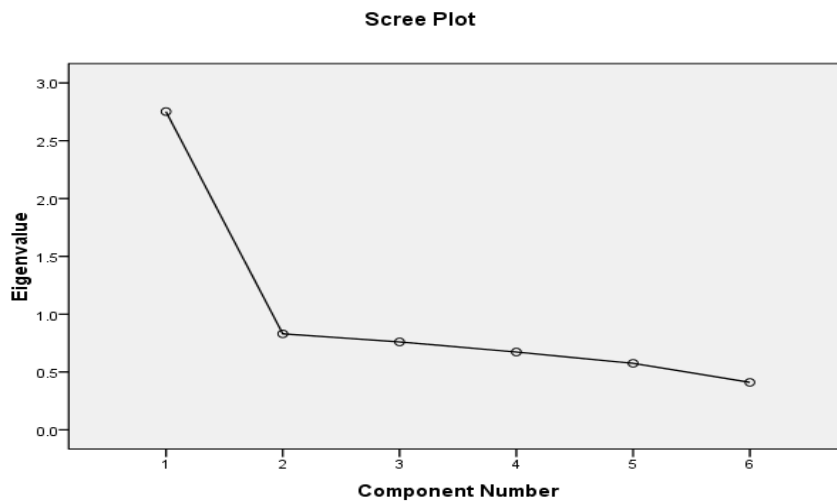


Figure 3.9: Scree plot for the six items of familiarity with library use score.

The value of KMO, which is 0.698, indicates that factor analysis is useful with the fifth subscale data (the role of the library). It comprises six variables, which are Q27, Q28, Q29, Q30 and Q31 and Q32. PCA using a one factor solution resulted in a single factor accounting for 46.72 % of the variance. The eigenvalue was 2.80, with the scree plot supporting the extraction of the one component factor.

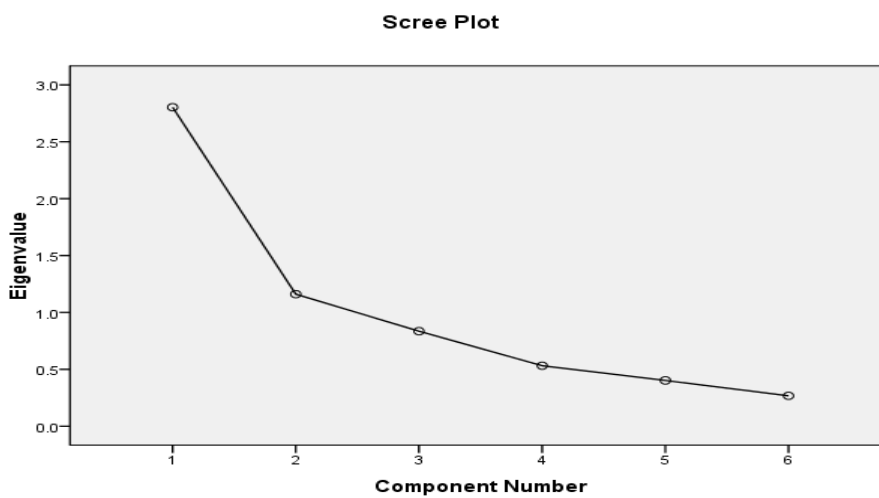


Figure 3.10: Scree plot for the six items of the library role score.

## Appendix 6-A: Ethical Information Sheet



Information School

### 1. **Research Project Title:**

#### **THE ROLE OF KUWAIT UNIVERSITY LIBRARIES IN SUPPORTING GRADUATE STUDENTS' RESEARCH**

### 2. **Invitation paragraph**

You are being invited to participate in this research project. Before you agree to participate, it is important to understand why the research is being undertaken and what it will involve. The accuracy and objectivity of your response will have a significant impact on the research findings. Please take your time to decide if you wish to be part of the research sample. If you have any questions regarding the topic or other questions, please feel free to ask.

### 3. **What is the project's purpose?**

Despite the fact that academic libraries should provide services for all students and faculty members at academic institutions, they are also required to focus more on graduate students' research and provide them with effective services according to their needs. Therefore, the purpose of this study is to investigate the resources and services offered by Kuwait University (KU) libraries to graduate students and the role played by KU libraries to support them, particularly in their research, in order to improve their information resources and services in response to changing needs.

### 4. **Why have I been chosen?**

As this research focuses on the libraries' role in supporting graduate students, only those students who are engaged in this level of research will be covered. The participants in this project have been chosen because they are considered to be the users of the services under investigation. They will be chosen randomly from the colleges of KU and will be recruited through departmental contacts.

### 5. **Do I have to take part?**

It is completely up to you to decide whether to take part in this research project or not. If you decide to take part, you will be given this information sheet to keep and will be asked to confirm your consent formally. You can still withdraw at any time without affecting any benefits that you are entitled to in any way. You do not have to give a reason.

### 6. **What will happen to me if I take part?**

You will be asked to complete a questionnaire and/or participate in an individual interview. The questionnaire will take only a short time to complete. The interviews are estimated to last between 45 minutes and 1 hour. You will be asked some questions related to the aim of the study, mentioned above. Interviews will be conducted in a departmental meeting room. Participants will be asked some open-ended questions related to the research area. They will be asked to share their experiences, opinions and

suggestions, discuss in depth how they use the library resources and services and express their satisfaction regarding the usage. This is part of a qualitative research method that will be used in this project.

### **7. What do I have to do?**

If you decide to take part, you will be expected to answer questions related to your area of research. You will be invited to share your experiences, opinions and suggestions regarding the resources and services of the university library.

### **8. What are the possible disadvantages and risks of taking part?**

There are no risks associated with taking part. We are only expecting participants to answer questions without any interference.

### **9. What are the possible benefits of taking part?**

Whilst there are no immediate benefits for those participating in the project, it is hoped that this work will be of value to those involved because it will help focus the attention of the KU libraries administration on the academic services needed by graduate students.

### **10. What happens if the research study stops earlier than expected?**

If this happens, all the participants will be notified and the reasons will be explained.

### **11. What if something goes wrong?**

If something goes wrong and causes any inconvenience to a participant, s/he is welcome to contact the applicant to address her/his complaint. If the problem is not resolved, s/he can contact my supervisor:

Professor Sheila Corrall

Head of Department and Professor of Librarianship & Information Management

Information School, The University of Sheffield

Tel: +44 (0)114 222 2632

E-mail: [s.m.corrall@sheffield.ac.uk](mailto:s.m.corrall@sheffield.ac.uk)

[www.sheffield.ac.uk/is/staff/corrall.html](http://www.sheffield.ac.uk/is/staff/corrall.html)

If the problem still exists, s/he can contact the University Registrar and Secretary to report the problem.

### **12. Will my taking part in this project be kept confidential?**

All the information that we collect about you during the course of the research will be kept strictly confidential. You will not be identified in any reports or publications. In addition, all transcripts of interviews and digital audio recordings will be destroyed at the end of this research project.

### **13. What type of information will be sought from me and why is the collection of this information relevant for achieving the research project's objectives?**

You will be asked about your experiences and opinions of the library's resources and services. This information is relevant to investigating how KU libraries currently support graduate students' research and how they should do this in the future.

**14. What will happen to the results of the research project?**

The findings of this research project will be used in writing a PhD thesis that will be held in the library of the University of Sheffield. Probably some of collected data will be published in some scientific journals. However, no findings that can identify any respondents will be published. A summary of the study after its completion will be sent to all participants without mentioning their names.

**15. Who is organising and funding the research?**

This research is self-funded to obtain a PhD in Information Studies at the University of Sheffield.

**16. Who has ethically reviewed the project?**

The research project has been ethically approved by the Research Ethics Committee of The Information School at The University of Sheffield. The University of Sheffield's Research Ethics Committee (UREC) monitored the project.

**17. Contact for further information**

For further information, please contact me:

Email: [lip08waa@sheffield.ac.uk](mailto:lip08waa@sheffield.ac.uk)

Room 224, Information School, The University of Sheffield, Regent Court, 211, Portobello Street, Sheffield, S1 4 DP

Mobile: (+965) 99604207 (Kuwait) or (+44) 07551949136 (UK)

A copy of this information sheet will be given to you with a signed consent form.

Finally, if you wish to obtain a copy of the research findings, please give contact details:

.....  
.....

Thank you very much for participating in this study.

Your participation was very valuable to me.

## Appendix 6-B: Participant consent form



Information School

Title of Research Project

THE ROLE OF KUWAIT UNIVERSITY LIBRARIES IN SUPPORTING GRADUATE STUDENTS' RESEARCH

Name of Researcher: Wafaa Ahmed Al Motawah

**Participant Identification Number for this project: Please initial box**

1. I confirm that I have read and understand the information sheet/letter dated 2 April 2010 explaining the above research project and I have had the opportunity to ask questions about the project.

2. I understand that my participation is voluntary and that I am free to withdraw at any time without giving any reason and without there being any negative consequences.

In addition, should I not wish to answer any particular question or questions, I am free to decline. The research team can be contacted a Tel: 00 44 (0)114 222 2632/2635

3. I understand that my responses will be kept strictly confidential. I give permission for members of the research team to have access to my anonymised responses. I understand that my name will not be linked with the research materials, and I will not be identified or identifiable in the report or reports that result from the research.

4. I agree for the data collected from me to be used in future research.

5. I agree to take part in the above research project.

\_\_\_\_\_  
Name of Participant  
(or legal representative)

\_\_\_\_\_  
Date

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Name of person taking consent  
(if different from lead researcher)

\_\_\_\_\_  
Date

\_\_\_\_\_  
Signature

To be signed and dated in the presence of the participant

\_\_\_\_\_  
Lead Researcher

\_\_\_\_\_  
Date

\_\_\_\_\_  
Signature

To be signed and dated in the presence of the participant Copies:

Once this has been signed by all parties, the participant should receive a copy of the signed and dated participant consent form, the letter/pre-written script/information sheet and any other written information provided to the participants. A copy of the signed and dated consent form should be placed in the project's main record (e.g. a site file), which must be kept in a secure location.

## Appendix 7-A: Semi-structured interview schedule

### **Introduction**

Welcome the participant. Check that the time is still convenient. Estimate 1 hour for the interview. Try creating a relaxed atmosphere for the interview to be recorded. Inform them that I will make some notes.

Questions: Explain that there are lots of questions to be answered and this is not meant to be insulting or time wasting. The questions are to highlight the area of interest and act as starting points for broader discussion, where relevant.

### **Questions**

#### **Background**

1. Tell me about your research interests. What research do you plan to complete or have completed?

#### **Library collection**

1. What types of materials have you used in your research?
2. How often do you use the following resources to seek information for your research?

*Prompts:* books, journals, conference proceedings, others

3. Where do you find these materials?
4. What role does the Internet play in finding your research materials?

#### **Academic library use**

1. How often do you visit the library and study room?  
*Prompts:* daily/weekly; monthly; a few times/year; never
2. Tell me, how do you use the university's online library resources?
  - a. If you do not use them, tell me why.
  - b. If yes, which kinds of online resources do you use?

*Prompts:* online catalogue, database, e-journals, others

- c. Do you access them through the library website?
3. How reliant are you on interlibrary loans for obtaining your research materials?

#### **User satisfaction**

1. How valuable are the information resources provided by the library in your field?

*Prompts:* journals; books; conference papers



2. How valuable are the services provided by the library in enabling you to prevent the duplication of your research effort?

3. What is your level of satisfaction with library resources in your subject areas?

*Prompts:* very satisfied, satisfied, dissatisfied, neither satisfied nor dissatisfied

4. What is your level of satisfaction with library services in your subject areas?

*Prompts:* very satisfied, satisfied, dissatisfied, neither satisfied nor dissatisfied

5. Are there any barriers that sometimes prevent you from obtaining the information needed for your work?

### **Librarian support role**

1. What role does the library/librarian play in meeting your research needs

2. By what method would you like to learn about library resources and services in the future?

### ***Final question***

Do you have any comments or suggestions for developing the resources and services of the library?

Thank you for taking part in this interview; it has been extremely useful. I will be transcribing the interview. Do you require copies of the digital recording or transcript?

Thank you. Best of luck!

Wafaa. Al-Motawah

## Appendix 7- B: Focus group schedule

### Introduction

Good afternoon, as part of my investigation into the supporting role of Kuwait University (KU) libraries for research, I am seeking to gather information about the resources and services provided by KU libraries to support graduate students in their research.

You have been asked to participate in this focus group interview as graduate students studying at KU. The focus group will take approximately 45 minutes and please answer the interview questions to the best of your ability. Although the interview will be audio taped, your identity will never be revealed in any way through your comments.

Before we begin the interview, I'd like to confirm that you understand that your participation in this project is entirely voluntary, and that you may refuse to answer any question you wish and withdraw at any time. Let me know if you would like to skip a question because you don't want to respond to it.

May I turn on the audiotape now?

1. I believe that you, as a graduate students, need to use the library to help you with your research, so what is your impression about KU libraries resources and services?

### Library materials

2. How do you search for the materials you need?

*[Let me ask, are the resources you need easy to find? How do you search for them, and what services do you use to obtain those resources?]*

3. To what extent do you use the library online catalogue?

*[Probe, to what extent it is helpful to you? Did it enable you to find the materials very quickly?]*

4. Do you face any difficulty in using the online catalogue?

*[Probe, in what way?]*

5. To what extent does the librarian cooperate with you in helping you to find your research materials?

6. Are all the resources in your college library valuable for your research needs? *[Probe, can you find resources that are recently published, such as in 2009?]*.

7. What type of materials is mostly used in your field?

*[Probe, do you need to use, for example, audiovisual materials in your field].*

### Library Use

8. How often do you visit the library and the study room?

*[Probe, daily, weekly, monthly, few times/year, never].*

9. How often do you use the bibliographic database in your field?
10. Have you used the interlibrary loans to obtain your research materials?
11. How often do you use the reference desk?
12. Which services are more effective for your research?
13. To what extent do you use the internet services to search for your research materials?  
*[Probe, do you mostly use search engines?]*

**User satisfaction**

14. To what extent are you satisfied with your college library?  
*[Probe, with research materials, library services, and librarians' roles in supporting your research]*

**Librarian support role**

15. In what way do the librarians in your college play a role in supporting your research?  
*[Probe, providing information literacy workshop, training .....]*
16. How do you know about the new services offered by your college library to support your research?

**Final question**

Do you have any suggestions about improving the library resources and services?

Thank you very much for taking part in this focus group. It is extremely useful, and I really appreciate your participation.

Wafaa Al-Motawah,

## Appendix 7-C: Interview guide for the exploratory case study



### The University of Sheffield Information School

Dear colleagues,

I am doing a PhD research project under the supervision of Prof Sheila Corrall and Barbara Sen at the School of Information, University of Sheffield. The title of my research project is ‘**The role of Kuwait University libraries in supporting graduate students’ research**’. The aim of the research is to investigate how Kuwait University (KU) libraries support graduate students in their research and what factors affect this role. You are warmly invited to take part in the research. Please take your time to decide if you wish to be involved in the research sample or not. You can withdraw at any time without causing any trouble or having any negative impact. Answering the questions does not involve any personal responsibilities. In addition, it directly benefits you as graduate students, and it also directly benefits the Kuwait University Libraries Administration. The interview will take approximately 45 minutes to one hour.

Please be assured that the collected data will be used for scientific research purposes only and will be completely secure. No findings that could identify any respondents will be published.

If you have any questions regarding the topic or the questions, please feel free to ask. For further inquiries, please contact me at:

Email: [lip08waa@Sheffield.ac.ukb](mailto:lip08waa@Sheffield.ac.ukb)

Mobile: (+965) 99604207 (Kuwait) or (+44) 07551949136 (UK)

For any specific or urgent reasons please contact the research supervisor: Prof: Sheila Corrall

Information school–The University of Sheffield

Email: [s.m.corrall@sheffield.ac.uk](mailto:s.m.corrall@sheffield.ac.uk)

Tel: +44 (0)114 222 2632

If you wish to gain a copy of the research findings, please give contact details:

.....  
.....

Thank you very much for your co-operation.

W. Al-Motawah, Researcher

## The In-depth Interview Guide

### Part One: General information

- Name (optional).....
- Department.....
- Academic year:
  - First year
  - Second year
  - third year
  - final year
- Gender:  Male  Female
- Contact details.....  
.....  
.....  
.....

### Part Two: The interview questions

#### A. First stage Master's students

##### Warm up questions

1. In your discipline, what is the academic requirement for completing your programme?

(Small project, dissertation, comprehensive exam, etc.)

Can you tell me, on what type of research project you decided to work?

##### Questions

2. Tel me a little about the research in your subject area, How is it carried out?

Do you work alone or in research group?

If you work in a group, please tell me how you carry out the research?

3. How do you decide which topic is suitable for your dissertation/project?

Please, describe the processes you went through to define your topic?

4. Do you need to review the literature on your subject area for your dissertation/project?

If yes, please tell me how you conduct the literature search for your dissertation/  
project? (Please elaborate)

5. Tell me, how do you decide which research methodology might be useful for your topic?  
(Please elaborate)

6. After you have designed your research methodology, can you tell me how you design your  
research instrument? (Please elaborate)

7. Can you describe the help you might need when you search for information, and from  
whom you seek it?

8. Thinking back over your experience throughout this stage, do you feel that you use the  
information differently than when you first started? (Please elaborate)

### **B. Mid-stage Master's students**

#### **Warm up questions**

1. Can you tell me what type of research methods you use for your dissertation?

(Quantitative, qualitative, mixed methods.....etc.)

#### **Questions**

2. How do you decide that this research method can fit your research design? (Please  
elaborate)

3. What type of information do you need to help you when analysing your data? (Please give  
examples)

4. How do you find the information you need for analysing your data? (Please elaborate.)

5. Having analysed your data, do you need any information to help you understand what your  
results mean?

If so, tell me why. (Please give examples.)

Do you need to compare your results with those of previous studies?

6. If so, please tell me how you searched for information to compare your results with the findings of previous researchers on the same topic. (Please elaborate.)

7. What sort of information do you need when writing- up your dissertation? (Please give examples)

8. Thinking back over your experience of the last two years, do you feel that you used the information differently in the earlier stage of your study? (Please elaborate.)

### **C. Final stage Master's students**

#### **Questions**

1. After the research project is finished, how do you feel about your information searching habit? Is it different from the earlier stages of your research? (Please elaborate)

Did you need to use the library throughout the different stages of your study?

2. If so, please tell me what role was played by the library in supporting your research? (Please give examples.)

3. Thinking back over your experience of the last few years, do you feel that you used the information differently in the earlier stages of your study? (Please elaborate.)

#### **Final Question**

4. From your perspective, what should the academic library provide you with to support you effectively in your research?

Is there anything else you want to tell me about your experiences?

Thank you for your participation in this interview.

W. Al-Motawah, Researcher

## Appendix 7-D: List of thematic coding for the studied cases

**Table 1: Electrical engineering case**

<b>Main themes</b>	<b>themes</b>	<b>Sub-themes</b>
<b>The nature of the discipline</b>	Topic selection	Module-based Supervisor-based Multiple methods
	The nature of the topic	The nature of the design process Information sources used Supervisor E-resources Other sources
<b>Information needs</b>	Information awareness	
<b>Study mode</b>	Availability	Students' availability Library hours Library resources and services availability
	Accessibility	Access points Database subscriptions Restrictions on resources
<b>Students' personal experience</b>	Performance of library's services personal feelings Personal attitudes	
<b>Library information services</b>	Training and supports	Promotion of services Self-training Supervisor support
<b>External information sources</b>		Google search engine Specialists in the field Non-university libraries The supervisor
<b>Financial adequacy</b>	Capability	



**Table 2: Microbiology case**

<b>Main themes</b>	<b>themes</b>	<b>Sub-themes</b>
<b>The nature of the discipline</b>	Topic selection	Module-based Supervisor-based Literature-based Multiple methods
	The nature of the topic	Experimental nature Information sources used College library Supervisor Specialists in the field Other university libraries Bioinformatics tools Other resources
<b>Information needs</b>	Information skills capability	
<b>Study mode</b>	Availability	Students' availability Library hours Resources and services availability
	Accessibility	Access points Remote access Restriction on resources Limited English vocabulary
<b>Students' personal experience</b>	Performance of library's services  Communication experience	
<b>Library information services</b>	Training and support	Promotion of services Information skills training Self-training Supervisor support
<b>External information sources</b>		Specialists in the field Non-university libraries supervisor
<b>Financial adequacy</b>	Capability	

**Table 3: Public law case**

<b>Main themes</b>	<b>Themes</b>	<b>Sub-themes</b>
<b>The nature of the discipline</b>	Topic selection	Case study-based Supervisor-based Literature-based Consultation-based
	The nature of the topic	Professional nature Information sources used College library Supervisor Google Specialists' commentaries Personal network Professional libraries Other university libraries Travelling Other resources
<b>Information needs</b>	Information culture	
<b>Study mode</b>	Availability	Students' availability Resources and services availability
	Accessibility	Access points Restriction on resources Foreign Language barrier
<b>Students' personal experience</b>	Performance of library's services	Lack of specific information resources
	Personal feelings	
	Personal attitudes	
<b>Library information services</b>	Training and support	Promotion of services Library instruction Self-training Supervisor support
<b>External information sources</b>	Published information sources	Supervisor Books/exhibitions Travel Non-university libraries Official websites
	Unpublished information sources	Courts Specialists' commentary
<b>Financial adequacy</b>	Capability	

**Table4: Islamic history case**

<b>Main themes</b>	<b>Themes</b>	<b>Sub-themes</b>
<b>The nature of the discipline</b>	Topic selection	Supervisor-based
	The nature of the topic	Historical nature Informational sources used University libraries Non-university libraries Google and websites Personal collection Specialists in the field Supervisor Travel Book publishers and book stores Talking to people
<b>Information needs</b>	IT tool needs	
<b>Study mode</b>	Availability	Students' availability Resources and services availability
	Accessibility	Access points Restriction on resources Foreign source language barrier
<b>Students' personal experience</b>	Performance of library's services	Insufficient topic-specific resources
	Communication experience	
<b>Library information services</b>	Training and support	Promotion of services Library skills training Self-training Supervisor support
<b>External information sources</b>		Non-university libraries Google search engine Travel Supervisor
<b>Financial adequacy</b>	Capability	

## Appendix 8: What did the researcher learn from conducting the interview?

The interviews encouraged the researcher to establish a set of rules and follow them throughout the interviews:

- Arrive at the venue on time and show interest and respect to gain the informant's trust.
- Try to build a good rapport with the interviewee before recording the interview by initiating a good conversation and observing his/her body language.
- Give the informant a brief introduction to the topic before starting the recording.
- Do not sit too far away or too close to the interviewee.
- Encourage the interviewee to speak freely and openly so that the researcher can collect a breadth of information.
- Listen carefully to the informant and respect his/her opinion or point of view.
- Be patient and listen carefully to the interviewees' concerns without losing the research focus.
- Do not book more than two interviews per day.
- Use two recorders at the same time to ensure the interview is recorded.
- Be organised and at the same time flexible with the interviewees.
- Give the informant evidence of the researchers' ethical commitment.
- Do not ask to leave immediately the interview is over, as this is impolite.

## Appendix 9: Copyright permission

A:

Wafaa AM Al-Motawah [lip08waa@sheffield.ac.uk](mailto:lip08waa@sheffield.ac.uk)

12 July 2014 15:16

To: Cju@aber.ac.uk

Dear Christine,

I am writing to ask permission to reproduce one figure from one of your publications within my Doctoral thesis on Kuwait University libraries' role in supporting graduate students' research. I am a PhD student studying at the University of Sheffield, Information School, Faculty of Social Science.

The figure is the Information Behaviour Model, Figure (1) on page 1190 in Urquhart and Rowley (2007) Understanding students' information behaviour in relation to electronic services: lessons from longitudinal monitoring and evaluation, Part 2. *Journal of the American Society for Information and Technology*, 58(8).

My best wishes,

Wafaa Al-Motawah

Information School,

University of Sheffield

Regent Court, 211 Portobello St

Sheffield S1 4DP

E-mail: [lip08waa@sheffield.ac.uk](mailto:lip08waa@sheffield.ac.uk)

---

Christine Urquhart [cju] [cju@aber.ac.uk](mailto:cju@aber.ac.uk)

12 July 2014 17:08

To: Wafaa AM Al-Motawah [lip08waa@sheffield.ac.uk](mailto:lip08waa@sheffield.ac.uk)

That's fine, as long as you acknowledge the source.

Best wishes with the progress of your doctoral thesis!

Christine

---

**B:**

(Al-Motawah, Wafaa) Britannica

12 July 2014 14:49

From: Wafaa AM Al-Motawah [<mailto:lip08waa@sheffield.ac.uk>]

Sent: To: enquiries - General Enquiries at Britannica.co.uk

Subject: Copy right permission

Dear Editors,

I am writing to ask permission to reproduce one map from your publication within my Doctoral thesis on Kuwait University libraries' supporting role in graduate students' research. The map is of Kuwait. I am a PhD student studying at the University of Sheffield, Information School, Faculty of Social Science. May I have your written permission via e-mail (included in this letter) so that I can have the right to include this map in my thesis.

My best wishes,

Wafaa

Wafaa Al Motawah

Information School, University of Sheffield

Regent Court, 211 Portobello St

Sheffield S1 4DP

E-mail: [lip08waa@sheffield.ac.uk](mailto:lip08waa@sheffield.ac.uk)

**Ukcustomerservice** [ukcustomerservice@britannica.co.uk](mailto:ukcustomerservice@britannica.co.uk)

16 July 2014 09:34

To: "lip08waa@sheffield.ac.uk" [lip08waa@sheffield.ac.uk](mailto:lip08waa@sheffield.ac.uk)

Dear Wafaa Al-Motawah,

Thank you for your e-mail. Please could you provide a link to the exact map image that you would like permission to use so that we can verify this for you.

Kind regards,

Britannica Customer Service

If you can include any previous message history in your reply, it will speed up the time it takes to reply.

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Wafaa AM Al-Motawah [lip08waa@sheffield.ac.uk](mailto:lip08waa@sheffield.ac.uk)

16 July 2014 11:26

To: ukcustomerservice [ukcustomerservice@britannica.co.uk](mailto:ukcustomerservice@britannica.co.uk)

Dear Editors,

This is the link to the map that I need permission to reproduce in my thesis.

<http://www.britannica.com/blogs/2011/08/iraq-invades-kuwait/>

My best wishes,

Wafaa

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Wafaa AM Al-Motawah <lip08waa@sheffield.ac.uk >

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To: ukcustomerservice [ukcustomerservice@britannica.co.uk](mailto:ukcustomerservice@britannica.co.uk)

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<http://www.britannica.com/EBchecked/media/62079?topicId=325644>

My best wishes,

Wafaa

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Ukcustomerservice [ukcustomerservice@britannica.co.uk](mailto:ukcustomerservice@britannica.co.uk)

23 July 2014 15:15

To: "lip08waa@sheffield.ac.uk" <lip08waa@sheffield.ac.uk>

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Thank you for your e-mail.

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<http://www.britannica.com/EBchecked/media/62079?topicId=325644>

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Kind regards

Britannica Customer Service

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C:

Wafaa AM Al-Motawah <lip08waa@sheffield.ac.uk>

13 September 2014 15:23

To: T Wilson <t.d.wilson@sheffield.ac.uk>

Dear T.D. Wilson:

I am a PhD student studying at the University of Sheffield, Information School, Faculty of Social Science. I am writing to ask permission to reproduce your model of information behaviour (1980) from your 1981 publication on user studies and information needs in the *Journal of Documentation*, 37(1), 3-15 in my Doctoral thesis on Kuwait University libraries' supporting role in graduate students' research. May I have your written permission via e-mail (included in this letter) so that I can have the right to include this model in my thesis?

My best wishes,

Wafaa

---

Prof. T.D. Wilson <t.d.wilson@sheffield.ac.uk>

13 September 2014 15:55

Reply-To: t.d.wilson@sheffield.ac.uk

To: Wafaa AM Al-Motawah <lip08waa@sheffield.ac.uk>

Dear Wafaa,

You have my permission to reproduce any diagram from Wilson, T.D. (1981) on user studies and information needs, *Journal of Documentation*, 37(1), 3-15 in your Doctoral thesis.

Sincerely,

T.D. Wilson

T.D. Wilson, PhD (Sheffield), PhD, h.c. (Gothenburg), PhD, h.c. (Murcia),

Professor Emeritus, University of Sheffield

Publisher and Editor in Chief: Information Research

<http://informationr.net/ir/>

E-mail: [t.d.wilson@shef.ac.uk](mailto:t.d.wilson@shef.ac.uk)

Wafaa AM Al-Motawah <lip08waa@sheffield.ac.uk>

13 September 2014 15:57

To: T Wilson <t.d.wilson@sheffield.ac.uk>

Many thanks,

Wafaa

---

Wafaa AM Al-Motawah [lip08waa@sheffield.ac.uk](mailto:lip08waa@sheffield.ac.uk)

14 September 2014 14:49

To: T Wilson [t.d.wilson@sheffield.ac.uk](mailto:t.d.wilson@sheffield.ac.uk)

Dear Prof T.D. Wilson:

The exact article I adopted your model from was Wilson, T.D. (1999) Models in information behaviour research. *Journal of Documentation*, 55(3), 249-27. Would you please confirm your permission to reproduce this model from this article to be included in my thesis.

My best wishes,

Wafaa

---

Prof. T.D. Wilson [t.d.wilson@sheffield.ac.uk](mailto:t.d.wilson@sheffield.ac.uk)

14 September 2014 15:57

Reply-To: [t.d.wilson@sheffield.ac.uk](mailto:t.d.wilson@sheffield.ac.uk)

To: Wafaa AM Al-Motawah [lip08waa@sheffield.ac.uk](mailto:lip08waa@sheffield.ac.uk)

Yes, you have my permission to reproduce that diagram.

T.D. Wilson

---

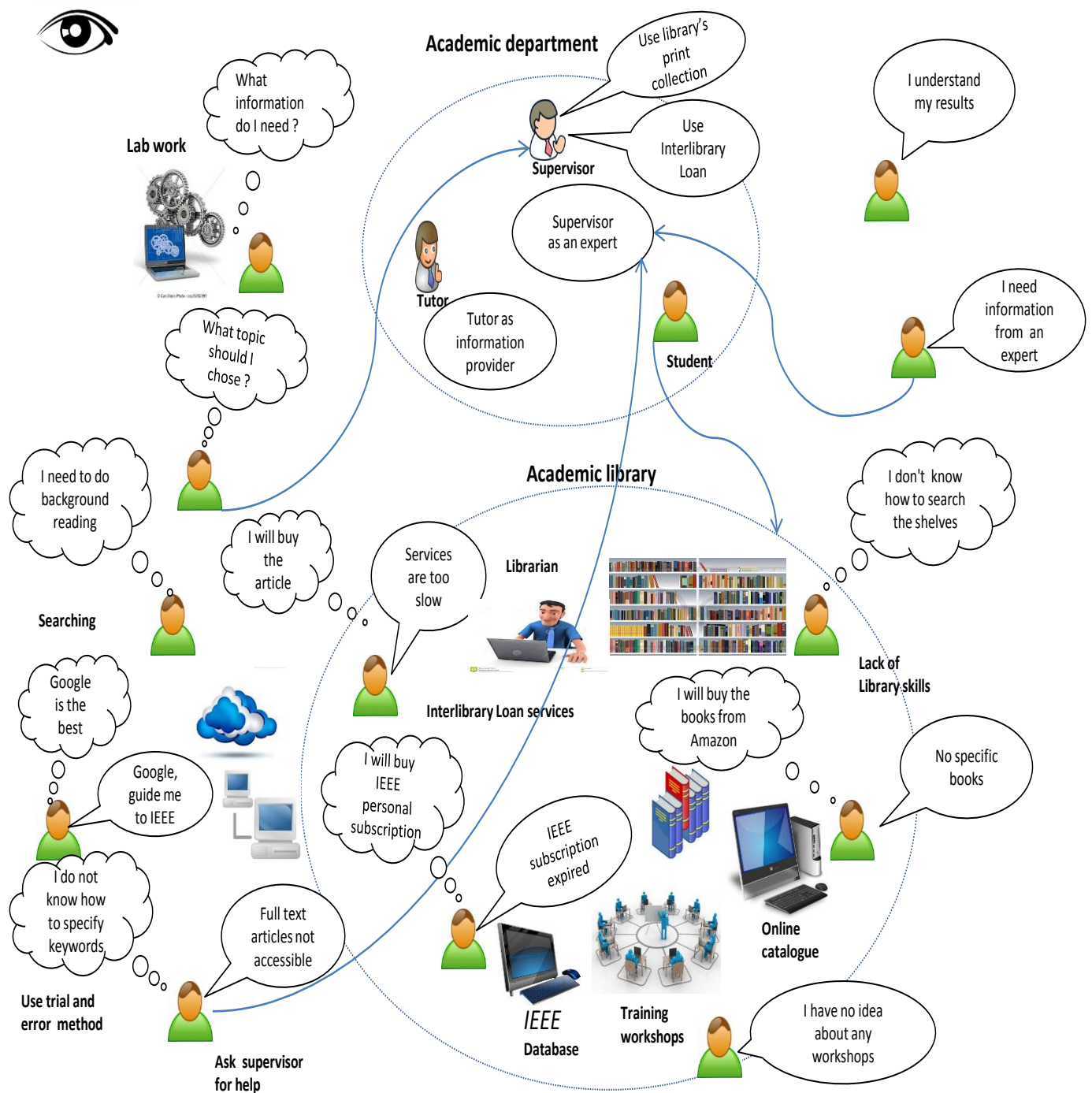
Wafaa <lip08waa@sheffield.ac.uk>

14 September 2014 18:55

To: "t.d.wilson@sheffield.ac.uk" [t.d.wilson@sheffield.ac.uk](mailto:t.d.wilson@sheffield.ac.uk)

Many thanks,  
Wafaa

# Appendix 10: Rich picture depicting the situation of the Engineering Library



## Appendix 11: Quantitative data analysis

### Kruskal–Wallis test results: (differences between colleges group)

Table 4.19 (a) Colleges group vs. library support dimensions

		Ranks	
	College	N	Mean Rank
Library provision	Engineering	257	305.53
	Science	123	328.62
	Art	103	262.49
	Law	95	224.77
	Total	578	
Materials used	Engineering	257	317.58
	Science	123	316.50
	Art	103	283.81
	Law	95	184.75
	Total	578	
User satisfaction	Engineering	257	302.09
	Science	123	328.87
	Art	103	299.95
	Law	95	193.14
	Total	578	
Library familiarity	Engineering	257	286.00
	Science	123	347.24
	Art	103	320.74
	Law	95	190.34
	Total	578	
Perceived role	Engineering	257	308.25
	Science	123	343.98
	Art	103	281.30
	Law	95	177.12
	Total	578	

**Table 4.19 (b) Test Statistics <sup>a,b</sup>**

	Library provision	Materials used	User satisfaction	Library familiarity	Perceived role
Chi-Square	26.347	48.135	40.461	52.401	60.368
df	3	3	3	3	3
Asymp. Sig.	.000	.000	.000	.000	.000

a. Kruskal–Wallis Test

b. Grouping Variable: College

**Kruskal–Wallis test results: (difference between age groups)**

**Table 4:20 (a) Age groups vs. library provision**

**Ranks**

Age	N	Mean Rank
Under 26	276	238.33
26–35	276	320.78
36–45	7	314.86
Total	559	

**Table 4:20 (b) Test Statistics <sup>a,b</sup>**

	Library provision
Chi-Square	36.668
df	2
Asymp. Sig.	.000

a. Kruskal–Wallis Test

b. Grouping Variable: Age

**Table 4:21 (a) Age group vs. materials provided**

**Ranks**

Age	N	Mean Rank
Under 26	276	241.76
26–35	276	316.05
36–45	7	366.57
Total	559	

**Table 4:21 (b) Test Statistics <sup>a,b</sup>**

	Materials used
Chi-Square	31.330
df	2
Asymp. Sig.	.000

a. Kruskal–Wallis Test

b. Grouping Variable: Age

**Table 4:22 (a) Age group vs. users' satisfaction**

**Ranks**

Age	N	Mean Rank
Under 26	276	236.64
26–35	276	320.97
36–45	7	374.00
Total	559	

**Table 4:22 (b) Test Statistics <sup>a,b</sup>**

	User satisfaction
Chi-Square	40.158
df	2
Asymp. Sig.	.000

a. Kruskal–Wallis Test

b. Grouping Variable: Age

**Table 4:23 (a) Age group vs. familiarity with the use of library services**

**Ranks**

Age	N	Mean Rank
less than 26	276	226.23
26–35	276	329.83
36–45	7	435.50
Total	559	

**Table 4:23 (b) Test Statistics <sup>a,b</sup>**

	Library familiarity
Chi-Square	63.935
df	2
Asymp. Sig.	.000

a. Kruskal–Wallis Test

b. Grouping Variable: Age

**Table 4:24 (a) Age group vs. perceived role of the library**

**Ranks**

Age	N	Mean Rank
Under 26	276	231.08
26-35	276	326.98
36-45	7	356.50
Total	559	

**Table 4:24 (b) Test Statistics <sup>a,b</sup>**

	Perceived role
Chi-Square	50.892
df	2
Asymp. Sig.	.000

a. Kruskal-Wallis Test

b. Grouping Variable: Age



## Appendix 12-A: Code books for the interview data

Table 3-6 Example of theory-driven codes with excerpts of text from the data sets

Excerpt of the data	First-level code (open coding)	Second-level code (cluster theme )	Whitley's theory-driven code (deductive code)	Definition of Whitley's theory-driven code	Whitley's dimensions
<p><i>My supervisor was the one who directed me to <b>access and use the IEEE</b> website to <b>search for papers</b> and also he recommended that I <b>use Google Scholar</b>. I also <b>used IEEE broadly</b> because <b>most of the information I needed was available there</b>. There were only few that I was not able to find on IEEE. <b>I searched for them by using Google Scholar</b> and its tools. <b>I used IEEE to access the papers</b> I found on Google, but I could not access them if they were available through IEEE. I found journals that included all of the papers I needed, but <b>those journals were only available to IEEE members</b>, those who had an IEEE membership, and I was not one of them. <b>The IEEE website was the main channel I used</b> to collect the required information and to access the articles I needed.</i></p>	<ul style="list-style-type: none"> <li>a. Has access to and use of IEEE website</li> <li>b. Search for papers</li> <li>c. Use Google Scholar</li> <li>d. Most of the information needed available on IEEE</li> <li>e. Use IEEE broadly</li> <li>f. Use Google Scholar tools</li> <li>g. Use IEEE to access papers</li> <li>h. Journals are only available for IEEE members</li> <li>i. IEEE is the main information channel</li> </ul>	<ul style="list-style-type: none"> <li>1. Mostly use e-resources</li> <li>2. Concentrate on IEEE database as a main source of information</li> <li>3. Use solitary communication channel</li> </ul>	Concentration of the communication channel	Due to the relative stability of the research object, the communication channels are more concentrated	High mutual dependence and low task uncertainty

**Table 3-7 Example of data-driven codes with excerpts of text from the data sets**

Excerpt of the data	First-level code (open coding)	Second-level code (cluster theme )	Data-driven code (inductive code)
<p><i>I was <b>reliant on the Internet</b> as I was collecting information on my topic. <b>I depend on the Internet as a source of information more than the library.</b> In the library, I didn't find the information resources that I need about the <b>software that I would use to carry out my project.</b> I only found <b>books that provide me with a theoretical background</b> for my research topic. When I discussed this issue with <b>my supervisor, he advised me</b> to search for <b>research papers</b> that tackled the <b>application of the software</b> that I need and, to <b>make sure that this software is appropriate</b>; I should apply it and collect the results that should resemble the results in the papers. When I needed to review the literature, <b>I searched the IEEE database</b> (Institute of Electrical and Electronic Engineering), which is specifically for our field. <b>I searched for research papers</b> related to my topic in this <b>database</b>, which is available on the library website.</i></p>	<ul style="list-style-type: none"> <li>a. Reliant on the Internet</li> <li>b. Depends on the Internet more than the library</li> <li>c. Uses the software for project application</li> <li>d. Uses books for theoretical information</li> <li>e. Seeks out supervisor's advice</li> <li>f. Searches for papers related to the application of software</li> <li>g. Searches the IEEE database</li> <li>h. searches for research papers</li> <li>i. use the library website</li> </ul>	<ul style="list-style-type: none"> <li>1. Internet as information source</li> <li>2. Software as information source</li> <li>3. Books as information resource</li> <li>4. supervisor as information source</li> <li>4. research papers as information source</li> <li>5. IEEE database as information source</li> </ul>	<p>Information sources used</p>

## Appendix 12-B: The Code book for all interviews data

Main Themes	Themes	Sub-themes	Definitions
The culture of the discipline	Topic selection	<ul style="list-style-type: none"> <li>Module-based</li> <li>Supervisor-based</li> <li>Literature-based</li> <li>Case study-based</li> <li>Consultation-based</li> <li>Multiple methods</li> </ul>	Each discipline has its own characteristics, nature and needs that influence the methods students use to select their research topics. The culture of the discipline will also affect the students' use and need of information resources such as the library.
	The nature of the topic  Information sources used	<ul style="list-style-type: none"> <li>Design nature</li> <li>Experimental nature</li> <li>Professional nature</li> <li>Historical nature</li> <li>College library</li> <li>Other university libraries</li> <li>Non-university libraries</li> <li>Professional libraries</li> <li>Supervisor</li> <li>Specialists in the field</li> <li>E-resources</li> <li>Google and websites</li> <li>Bioinformatics tools</li> <li>Personal collection</li> <li>Book publishers and book stores</li> <li>Personal network</li> <li>Talking to people</li> <li>Specialists' commentaries</li> <li>Travelling</li> <li>Other resources</li> </ul>	
Information needs	<ul style="list-style-type: none"> <li>Information awareness</li> <li>Information skills capability</li> <li>Information culture</li> <li>IT tool needs</li> </ul>		The term 'information needs' refer to students' need to use specific sources of information to complete their research.

Study mode	Availability	Students' availability Library hours Library resources and services availability	Students attend the university either part-time or full-time. Students' study mode will influence their availability and ability to interact with and access library services.
	Accessibility	Access points Remote access Database subscriptions Restrictions on resources Limited English vocabulary Foreign Language barrier	
Students' personal experiences with the library	Performance of library's services	Insufficient topic-specific resources	The library provides several sets of services equally for its users, but each student has his/her own experience with the library. The students' experiences with the library services will influence the level of their interaction with and use of the library.
	Communication experiences personal feelings Personal attitudes		
Library information services	Training and supports	Promotion of services Library instruction Information skills training Library skills training Self-training Supervisor support	The library provides set of services to support students' research, such as EIRs. Educating the students on how to use these services and marketing the services will influence their level of interaction with and use of the library.
External information sources	Published information sources	Google search engine Specialists in the field Non-university libraries The supervisor Books/exhibitions Official websites Travel	External information sources are the sources a student uses outside the university library to satisfy his/her information needs. These sources vary, and can include the supervisor, professionals in the field, Google, etc.
	Unpublished information sources	Courts Specialists' commentary	
Financial adequacy	Capability		This cultural identity factor reflects the students' financial capability to purchase information resources that they cannot access via the library.