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Information literacy conceptions among medical undergraduate students: A case study of the Faculty of Medicine, Kuwait University

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A thesis submitted in partial fulfilment of the requirements for the degree of
Doctor of Philosophy

The University of Sheffield
Faculty of Social Sciences
Information School

December, 2023

Declaration

I, the author, confirm that the Thesis is my own work. I am aware of the University's Guidance on the Use of Unfair Means (www.sheffield.ac.uk/ssid/unfair-means). This work has not previously been presented for an award at this, or any other, university.

Abstract

Background: Information literacy is a critical phenomenon and is an important aspect of learning within the educational environment as well as within many other vital sectors. This importance is reflected by a considerable number of professional bodies (e.g. ACRL 2016, SCONUL, 2011) developing their frameworks to support information literacy educational practices. Most of them were developed in Western countries such as the USA, the UK, Canada, Australia, and New Zealand. This means that these models and frameworks reflect the cultural and linguistic characteristics of the country in which they were developed. Notably, they are widely used by librarians and educators in most academic institutions in the Arabic region but it is not clear if local needs are met. Therefore, this study aims to develop a model of information literacy for the Faculty of Medicine at Kuwait University.

Methods: A holistic single qualitative case study with embedded units of analysis (medical undergraduates in phases I, II, and III), was adopted. Data were collected using a wide range of tools, namely semi-structured interviews, a focus group discussion, and relevant documents such as Health Science Centre Library websites, students' assignments, undergraduate student handbook (2021-2022), Evidence-based Medicine modules' outlines, student guide for Community Medicine & Behavioural Sciences project and computer into Medicine module outline and curriculum. They were purposively sampled from 55 participants, including medical academics (18), librarians (6), and undergraduate students (31). They were thematically analysed using both inductive and deductive (SCONUL model) approaches with the help of MAXQDA software.

Results: The findings show that information literacy was conceived as (1) core competencies, (2) higher-order cognitive and critical thinking skills, and (3) taking critical decisions in a humanitarian way. They also reveal that there are three aspects that shape an information-literate individual within the context of the Faculty of Medicine, comprising knowledge (knowing), skills (doing and thinking) and attitudes (feeling). Although information literacy aspects are seen as a critical element in achieving the Faculty of Medicine's vision and mission, medical students have few opportunities for learning information literacy skills.

Originality: The contributions of this study can be used to inform a range of theoretical, methodological and practical aspects. The current study attempts to address multiple gaps in the literature and, in doing so, makes significant contributions. It is the first attempt aimed at developing an information literacy model in Arabic, Gulf Council Countries and Kuwait contexts. Therefore, it has made a significant theoretical contribution to the field of information

literacy by closing the gap in the literature; that is, those in the Arabic region and Gulf Council Countries have not yet developed their own information literacy models and frameworks. Furthermore, it has also made a theoretical contribution to the SCONUL model through making significant modifications and changes in order to fit the context of the Faculty of Medicine at Kuwait University. For example, the “Present” pillar in the SCONUL model has been broken down into other pillars, such as “synthesising medical information and clinical evidence”, “interpersonal and communication skills”, and “Information implementation and application” in order to accommodate a wide range of context-based higher-order information abilities. The developed model can also serve as a basis for designing information literacy instructional interventions in the Faculty of Medicine setting through capturing the different aspects of what medical students are required to become information literate. It delineated the characteristics of being information literate within the context of the Faculty of Medicine by outlining the most attitudinal, cognitive, behavioural and knowledge aspects that medical students need to develop. Therefore, it can be used by librarians and educators as a guidance and a framework to inform the design and structure of information literacy teaching programs for medical students at Kuwait University. More specifically, it can be used to determine the students’ information needs and the type of training programme content based on their different learning requirements according to their different levels and phases.

Keywords: Information literacy conceptions, Kuwait University, Information literacy education, Information literacy model development, Arabic context, Gulf Council Countries ,
The Faculty of Medicine

Acknowledgment

A huge gratitude to almighty Allah for granting me the strength and patience over my research journey.

I am deeply grateful to my supervisors Ms. Sheila Webber and Dr. Sophie Rutter for their expert advice and constructive feedback which were invaluable in shaping this thesis. Without your support, guidance, encouragement, this research would have not been possible.

I am grateful to all participants who took part in this study. Thank you for your collaboration and appreciation for the research impact.

Special thanks go to my friend Dr. Fhaid Alajmi for his persistent support before and after commencing the research project.

Special thanks go to my friend Hamad Alshamari for his honest feelings and ongoing support.

I dedicate this research to my family members, especially to my mother and sister. I am deeply grateful to my beloved nephews: Dr. Hajer, Dr. Sara, Dr. Sultan and Dr. Maryam for their persistent support and encouragement.

Many thanks go to my brother Dr. Waleed for his ongoing encouragement and support and he was always keeping in touch over my research journey.

Words are not enough to express my warm feelings to my beloved wife and sons: Yousef and Ayoub for their patience, appreciation, support and understanding of my research journey circumstances over the last six years at The University of Sheffield, thank you so much.

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Acronyms and abbreviations

ACRL: Association of College and Research Libraries

ALA: American Library Association

AMEE: Association for Medical Education in Europe

ANZIL: Australian and New Zealand Information Literacy Framework

APA: American Psychological Association

B.M.B.Ch: Bachelor of Medical Sciences and of Bachelor of Surgery

B.Med.SC: Bachelor of Medical Sciences

CAN-Q: College of the North Atlantic in Qatar

CARS: Credibility, Accuracy, Reasonableness, Support

CILIP: Chartered Institute of Library and Information Professionals

CMBS: Community Medicine & Behavioural Sciences

CMD: Community Medicine Department

CMUQ: The University of Carnegie Mellon

DMP: Data Management Plan

EBM: Evidence-based Medicine

EBP: Evidence-based Practice

EBL: Evidence-based Learning

FOM: The Faculty of Medicine

GCC: Gulf Council Countries

HE: Higher Education

HL: Health Literacy

HIL: Health Information Literacy

HSCL: Health Science Centre Library

IBL: Inquiry-based Learning

IL: Information Literacy

ILE: Information Literacy Education

ILN: Information Literacy Network

ILG: Information Literacy Group

IMC: Introduction to Medicine Computers

IPR: Interview Protocol Refinement

KU: Kuwait University

LIS: Library and Information Science
MeSH: PubMed and Medical Subject Headings
MCQs: Multiple-Choice Questions
MLA: Medical Library Association
MA: Master's Degree
MCQ: Multiple-Choice Question
MD: Doctor of Medicine
NCSU: North Carolina State University
NLM: National Library of Medicine
OPAC: Online Public Access Catalogue
OSCE: Objective Structured Clinical Examinations
PjBL: Project-based Learning
PBL: Problem-based Learning
RDM: Research Data Management
SCONUL: Society of College, National and University Libraries
SPSS: Statistical Package for the Social Sciences
TILD: Training and Information Literacy Department
TA: Thematic Analysis
UAE: United Arab Emirates
UNESCO: The United Nations Educational, Scientific and Cultural Organization
WWW: World Wide Web
VARK: Visual, Aural, Reading/Writing, and Kinaesthetic
VPN: Virtual Private Network
ZU: Zayed University

Chapter 1 Introduction

1.1. Chapter overview

This chapter presents the following: an overview of information literacy, information literacy in the medical context, information literacy in Arabic context, personal motivation, the statement of the problem, the aims and objectives of the study, research questions, and, finally, the structure of the thesis.

1.2. Information literacy

Information literacy (IL) is a critical phenomenon and is an important aspect of learning within the educational environment as well as within many other vital sectors. It has been seen as an essential element that addresses the complexity of the rapid production of information resources through a wide range of complicated platforms in the digital era. Therefore, Bruce (2004) asserts that, due to the development of information technology and the complexity of the contemporary information environment, educators should recognise that students need to be engaged with this environment as an essential part of the formal learning process. It has become a crucial attribute for everyone in the 21st century, regardless of age and experience (SCONUL, 2011); an essential element in transferring information into knowledge (Forster, 2015a) and also seen as a graduate attribute that reflects the capacity for lifelong learning (Bundy, 2004).

Since IL was first defined by Zurkowski (1974), it has increasingly become a subject of interest to scholars and professional bodies. As a result, it was widely defined, conceptualised and investigated in different contexts, including higher education (HE) (i.e. Bruce, 1997; Boon et al., 2007), evidence-based practice (EBP) context (Dalton, 2013), nursing environment (Forster, 2015a, 2015b), firefighter workplace (Lloyd, 2005), undergraduate students (Lupton, 2008), small business workplace (Lockerbie & Williams, 2019). Those who have IL can “demonstrate an awareness of how they gather, use, manage, synthesise, and ethically create information and data and will have the information skills to do so effectively” (SCONUL, 2011, p.3).

1.3. Information literacy in the medical context

It has been recognized that IL is an essential competency closely associated with educational success, workplace preparation, lifelong learning, as well as informed citizenry (Weiner, 2014). It is also noted that IL is practised and experienced differently according to the context and discipline (Webber et al., 2005; Weiner, 2014). One of these disciplines is health sciences

and medicine. As the Medical Library Association (MLA) confirms, health information is prevalent everywhere yet the process of obtaining it can be difficult (Haruna & Hu, 2018, p.306). This emphasises the importance of IL in educational interventions as a prerequisite for medical students and those who are working in an environment where approaches such as Evidence-Based Medicine (EBM) and Problem-Based Learning (PBL) are widely used. It is believed that IL plays a key role in health sciences programmes and affects teaching, learning and research practices (Ullah & Ameen, 2019). This is especially seen to be the case in the context of EBM, in which clinical and medical practices are based on evidence and other research (Forster, 2015a). Hence, Forster (2013) argued that, without the ability to locate, access and critically evaluate evidence to be used by health sciences' students and professionals, clinical practice becomes unachievable and poses a potential danger to the patients.

More specifically, IL closely aligns with Learning Objectives for Medical Student Education Guidelines for Medical Schools documented in the Association of American Medical Colleges, stating that "future physicians must be able to find biomedical information from databases and other sources, manage and use it to solve problems and make decisions that are relevant to the care of individuals, critically evaluate information and its source and apply them appropriately to decision- making in practice" (Golenko & Arh, 2020, p.21). These objectives, which are already adopted by FOM at KU, are strongly in line with the conceptions of IL. Despite the significance of IL within medical settings, many studies found that medical students have limited IL competencies and sometimes they are not able to successfully analyse and evaluate information resources and effectively search reliable databases, like PubMed (Baro et al., 2011; Kloda, 2008; Nicholson et al., 2020; Panahi, S., Mirzaei, A., & Bazrafshan, 2020; Sharma & Lata, 2019; Tagge, 2018).

Regarding the context of KU, Rehman and Ramzy (2004) conducted a quantitative study to find out the main reasons that the majority of electronic information resources (EIRs) available at the Health Science Centre Library (HSCL) of the Faculty of Medicine (FOM) at Kuwait University (KU). They found that these resources are not fully utilised by medical professionals such as physicians, pharmacists and dentists who are affiliated with three teaching faculties. The underutilization of these resources was due to the low level of research skills and competencies. This may be attributed to the inadequacy of information literacy education (ILE) which could be due to the lack of strategic documents (e.g. IL models) which are regarded as a cornerstone of implementing IL instructional programs.

1.4. Information literacy in Arabic context

Due to the importance of IL as a fundamental aspect for the learners within the educational sector, a considerable number of professional bodies (e.g. ACRL, 2000, 2016; SCOUNL, 1999, 2011; ANZIL, 2004) developed their IL models and frameworks in order to support ILE practices in all educational sectors and academic contexts through providing the essential principles, standards and practices related to IL (Bundy, 2004). Most research studies have been conducted in the context of Western societies (i.e., the USA, UK, Australia, Canada, and New Zealand), while research concerned with the Arabic region being almost non-existent (see Chapter 2). This is problematic because IL may be experienced differently in different contexts, countries, cultures and disciplines (Lloyd, 2005).

The reviewed literature revealed that the majority of IL instructional practices in HE institutions in Gulf Council Countries (GCC) and other Middle East countries are shaped and guided by these Western IL models and frameworks to meet their local learners' needs (Houlihan et al., 2016; Sandercock, 2016; Martin et al., 2010; Pullman, 2016; Johnston et al., 2014; Shana & Ishtaiwa, 2013; Al-Aufi & Al-Azri, 2013; Ashoor, 2005). This is because they have not yet developed their own IL models and frameworks (Russel & Houlihan, 2017) but without considering the contextual variables that affect the way in which people learn (Dorner & Gorman, 2006).

Robinson and Bawden (2018) and Nowrin, Robinson and Bawden (2019) emphasise the cultural and linguistic issues when using Western IL models in shaping IL instructional practices in countries whose language and culture differ from those where such models were developed. The issue of cultural influence has a major impact on IL in terms of the way of defining IL, of developing IL programmes, and of delivering IL content (Dorner & Gorman, 2006). This was also recognised by Bundy (2004) when the Australian and New Zealand Information Literacy (ANZIL) framework was introduced in the context of HE in Australia. Bundy indicates that the concepts of IL and its models and frameworks cannot be treated as a one-size-fits-all or fixed single template that suits all environments, circumstances, or situations, but all inform them of these elements. Therefore, Bundy (2004) recommends that further testing of the applicability of these models before the actual application in a new context is required.

These models and frameworks define IL as a set of skills and attributes (Sample, 2020) but neglect the sociocultural aspect of the concepts of IL (Lloyd, 2005). They were developed in Western countries and thus reflect the cultural and linguistic characteristics of the country in

which they were developed. However, they are widely used and employed by librarians and other IL educators in most academic institutions in the Arabic region in general and GCC in particular but it is not clear if their local needs are met (Houlihan et al., 2016) and fully reflect the contextual, cultural and linguistic characteristics of those living in the Arabic area (Birks & Eula, 2011).

IL may be experienced differently in different contexts, countries and cultures. Phenomenographic study conducted in the Arabic context by Salha (2011) identified conceptions of IL amongst Syrian school librarians, where some of the conceptions of IL emerging from this study were distinctively different to those that had emerged in Western studies. Based on the surveyed literature, there are very few empirical studies in relation to IL in the context of Arabic and GCC in general and in Kuwait in particular (Alhuraiti, 2022; Al-Issa, 2013; Leshner, 2002). There has been thus far no empirical study that investigates IL in the context of medicine at KU.

1.5. Personal motivation

This study is grounded in my interest, experience and educational background as a librarian for school and college libraries in Kuwait. This experience spans over nine years and has stimulated my curiosity about the main reasons behind the lack of students' lack of information skills and competencies. Due to a lack of robust academic and educational experience, I was not aware of the essence of this problem. However, after commencing my higher education at Sheffield University and studying the IL Module for an MA degree, the idea has developed substantially as I recognised how the IL concept is strongly associated with the learning process. This has encouraged me to research and delve further into this issue in the academic context of KU.

The attempt at the development of the IL model has not been made either in Kuwait or GCC contexts. In addition, the concept of IL has not been addressed or discovered in HE in the Kuwait setting from multiple perspectives with the triangulation of data sources before. Consequently, I was keen to know the influence of IL model on the learning of medical students and their clinical progression and fulfilment, to know how IL could be conceived in a context where IL is regarded as an unfamiliar term.

KU, which is the context of this study under investigation, is the only public research university in Kuwait. Oates (2006) proposes many justifications for the selection of a particular case. Convenience is one of these justifications which relates to the fact that the stakeholders in the

selected case have agreed to give the researcher access. The researcher of this study had access to the selected site and was given ethical approval by a committee from the FOM at UK to conduct this research as shown in appendix (9, p. 322). Obtaining the access to the selected site from the FOM which is regarded as one of the highest prestige medical faculty in the GCC is regarded as one of the main motivations for the researcher to conduct this study as well.

1.6. The statement of the problem

IL has increasingly become a fundamental attribute of graduates in HE settings. Accordingly, most academic institutions in Western countries have created their own IL instructional programmes. These programmes are guided by the IL models and frameworks developed in their contexts to satisfy their learning requirements and information processes in specific landscapes. These models (e.g. ACRL, SCOUNL) are also used in different contexts worldwide, such as the Arabic region where the language, culture and education system are different from the contexts in which the above IL models and frameworks are designed. This is in line with what has been found by Lloyd (2017, p.91) that “ the different contexts, different concepts and different truths of IL generate a conundrum that affects the way IL is conceptualised, named and articulated”. Lloyd places much emphasis on the importance of the contextual factors in the development and understanding of IL. Lloyd argues that IL is shaped by social, physical and epistemic modalities that constitute the landscape where individuals are interplaying and engaging in it as a unique shape and character. Thus, the national culture and language are regarded as an important part of the social and physical context in understanding and articulating IL phenomenon.

As mentioned above, models as a documentation are a critical component in development, implementation and understanding of IL across culturally different contexts but little attention has been paid to developing IL models in GCC and Arabic countries. However, the existing definitions and models of IL emerging in Western contexts do not necessarily reflect their cultural, linguistic and learning needs. Thus, this study proposes to fill this gap using a case study approach: investigating IL perceptions from three perspectives (medical academics, librarians, and undergraduate students), to develop an IL model for the FOM at KU.

1.7. Research aims, objectives and questions

In order to address the above problem, this research study was developed with the following aims and objectives:

1.7.1. Research aims

This study aims to develop a model of IL for the Faculty of Medicine at Kuwait University.

1.7.2. Research objectives

To meet the above aim, the following objectives were set out:

RO1: Discover the conceptions of IL held by medical students, academics and librarians in the FOM at KU.

RO2: Investigate the current state of IL education practices in the FOM at KU.

RO3: Identify the medical students' requirements of IL within the context of the FOM.

1.7.3. Research questions

In order to achieve the above objectives, this study attempts to address the following research questions:

RQ1: How do medical academics, students, and librarians of the FOM conceptualise IL within the context of KU?

RQ2: What is the existing state of ILE within the context of the FOM?

RQ3: What is required of medical students to become information literate?

1.8. The structure of the thesis

The structure of this study consists of eleven (11) chapters, as shown in the following figure.

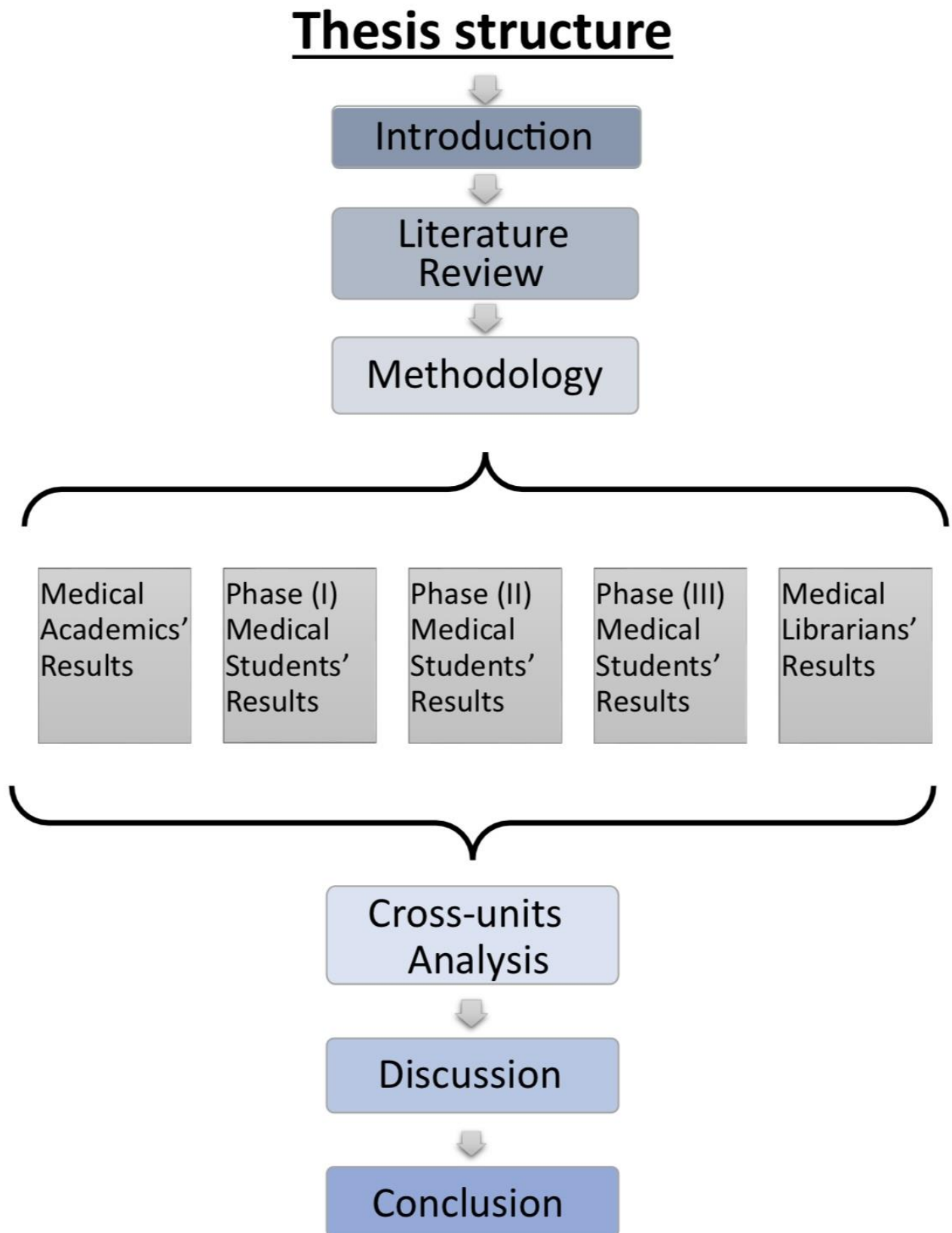


Figure 1-1 The structure of the thesis

Chapter (1) provides a general background to the study and contains the research problem, study aims, objectives and research questions. Following this, the researcher's motivation and interest are highlighted. Finally, the thesis structure is presented.

Chapter (2) reviews the existing literature and previous studies relating to IL. The first section presents the main IL concepts defined by organisations and scholars with a focus on the similarities and differences between them. The second section provides the standard IL models and frameworks while comparing them. The third section presents a general overview of the current state of IL in the Arabic and GCC regions by discussing the main challenges that hinder the progression of IL practices. The fourth section outlines standard IL educational practices. Finally, the primary educational practices in medicine are presented, and the relationship between EBM, PBL and IL skills is discussed.

Chapter (3) contains the research philosophy and methodology. It discusses the research paradigms and the ontological and epistemological positions adopted. It also discusses how data were collected and analysed. Finally, the ethical issues raised by this research are presented.

Chapter (4-6) reports the findings of phase (I, II, II) medical students after presenting the contexts of these phases, which are used as the unit of analysis of this case study.

Chapter (7) reports the findings of the medical librarians, which are used as a triangulation of data sources after presenting the context of the Health Science Centre Library Administration (HSCL).

Chapter (8) reports the findings of the medical academics affiliated with the FOM at KU and used as a triangulation of data sources.

Chapter (9) presents the discussion of the units of analysis (phase (I), (II), and (III)), as well as medical students and librarians to understand the overall picture of IL phenomena in the context of FOM at KU.

Chapter (10) presents the discussion of the most prominent points and themes that emerged from the analysis to address the research questions, achieving the research goal and then linking them to the findings from the literature.

Chapter (11) presents a brief conclusion of the research and a summary of the research aims and questions and how they have been addressed, reflecting on the contribution of this research

to the existing knowledge, identifying the implications of the findings for the practical practices, and finally highlighting the research limitations and then suggestions offered for the future research.

Chapter 2 Literature Review

2.1. Introduction

This chapter is structured around the research objectives and questions, making the research problem and gap more prominent. First, it offers a discussion of IL concepts and how IL can be differently conceptualised in a different context, focusing on IL concepts in the medical field. Second, IL models, standards and frameworks in the literature are discussed, and their importance and value as an essential mechanism and guidance in improving IL practices are highlighted. Third, the status of IL practices and the main challenges that hinder the development of IL within the Arabic and GCC context are discussed. Fourth, the relationship between IL and the pedagogical practices such as EBM and PBL widely used in the medical field is analysed. Finally, the latest educational practices concerned with IL teaching and learning within the context of medicine are covered.

2.2. Information literacy

2.2.1. The concept of information literacy

The term information literacy (IL) has been extensively and variously defined within the literature. It is stated that the term IL is not “without definition” (Campbell, 2008, p.17), nor is it “uncontested” (Coonan, 2011, p.5). Examining the IL literature regarding IL revealed that there is a plethora of IL definitions based on multiple theoretical and methodological perspectives, specifically within the librarianship and education discourse. Addison and Meyers (2013) developed a framework to follow the evolution of IL conceptions in the Library and Information Science (LIS) literature. They grouped IL definitions under three categories: *(1) a set of skills, (2) a way of thinking, and (3) social phenomena or practices*. Each approach encompasses different philosophical and pedagogical implications (Foasberg, 2015). This categorisation will be used in the next part of the discussion.

There is a wide range of IL concepts defined by information professional bodies. For example, ALA (1989) described information literate as:

“a person must be able to recognise when information is needed and have the ability to locate, evaluate and use effectively the needed information”
(American Library Association, In the USA).

SCONUL (1999) defined IL within HE to include the notion of an individual as:

“who can contribute to the synthesis of existing information, to further develop ideas building on that synthesis and, ultimately, create new knowledge in a

particular subject discipline” (Society of College, National and University Libraries, In the UK).

Forster (2015a) argues that both of the above definitions were based on a behaviourist theoretical perspective. According to Addison and Meyer’s (2013) framework, in the above definition, IL is seen as *a set of skills*, behaviours or abilities displayed by people while seeking information within a digital environment. These skills-based definitions provide information professionals with an identifiable set of learning outcomes that can be easily measured, which is regarded as one of the most significant advantages (Sample, 2020). However, there is still a limitation that is inherently viewed information from a narrow perspective as an objective entity and neglects the influence of social context in formulating IL meaning (Kocatepe, 2020).

In 2016, ACRL, a division of ALA, launched its IL Framework; this is considered to be a replacement version of the Information Literacy Competency Standards for Higher Education. In the introductory section of the Framework, the 1989 ALA IL definition was updated by ACRL as follows:

“Information literacy is the set of integrated abilities encompassing the reflective discovery of information, the understanding of how information is produced and valued, and the use of information in creating new knowledge and participating ethically in communities of learning” (ACRL, 2016, p. 8).

Based on the above classification, ACRL’s (2016) definition is subsumed under the second categorisation that sees IL as *a way of thinking*. In the above-extended definition of IL, several perspectives have been taken into account, including: “dynamism”, “flexibility”, “individual growth”, and “community learning” (ACRL,2016). A sociocultural philosophy has been adopted in the new definition that enables us to see IL “in less rigid terms”, as well as the collaborative and reflective aspects being introduced to its body (Hicks, 2018). The main differences between both definitions are summarised in the following table 2.1.

1989/2000 Definition	2015 Definition
Information literacy is a set of abilities requiring individuals to “recognize when information is needed and have the ability to	Information literacy is the set of integrated abilities
locate,	encompassing the reflective discovery of information
evaluate,	the understanding of how information is produced and valued
and use effectively the needed information”	and the use of information in creating new knowledge
	and participating ethically in communities of learning

Table 2-1: Comparison between IL definitions of ACRL 1989 & 2015 (Adopted from Hicks 2018, p. 72)

It can be noted that the most significant difference between both definitions is “the transition from a skill-based focus to one of knowledge-based learning and discovery” (Knapp & Brower, 2014, p.466). In the revised SCONUL model, information-literate individuals are described as those who

“will demonstrate an awareness of how they gather, use, manage, synthesise, and ethically create information and data and will have the information skills to do so effectively” (SCONUL, 2011, p.3).

In the new definition, the focus is more distinctive on real-world competence, and it emerged from a competency model in which a blend of constructivist and behaviourist approaches is adopted. It concentrated on the skills required for real-life experience. Using constructivist ideas, IL skills can be used and applied in various contexts and settings for specific purposes and not merely to perform a task or demonstrate knowledge abstractly (Forster, 2015a). The 2011 SCONUL definition has provided several recommendations to the practitioners when designing IL teaching, including functional skills teaching modification, addressing affective aspects, incorporating IL into the subject courses and aligning IL to academic skills (Martin, 2013).

Forster (2015b) observes that the aspect of contextual development of knowledge has been neglected in the definition of IL mentioned in the revised SCONUL (2011) model. However, this has been included as part of the previous definition of 1999, as evident from the following table 2.2.

1999 SCONUL definition of IL	2011 IL SCONUL definition	2015 Foster's proposed definition of IL
We felt that, within higher education, information literacy should include the notion of an individual.	Information-literate people will demonstrate an awareness of how they	An information-literate person can demonstrate an awareness of how they
Who can contribute to the synthesis of existing information, to further develop ideas building on that synthesis	gather, use, manage, synthesise and create information and data	gather, use, manage and synthesise information and data
	in an ethical manner	in an ethical manner
Ultimately, create new knowledge in a particular subject discipline.		in the development of their contextual knowledge and understanding
	and will have the information skills to do so effectively	and [has] the information skills to do so effectively

Table 2-2: Comparison of IL definitions of SCONUL 1999, 2011 & Foster's 2015b

Chartered Institute of Library and Information Professionals (CILIP) revised its definition of IL in 2018 in response to many recommendations suggested by the Information Literacy Group (ILG). Secker (2018), who was involved in developing a new definition, felt that the old CILIP definition did not reflect the research and initiatives in the context of the UK. The new definition was inspired by previous works, including the UNESCO Alexandria Proclamation, the updated ACRL Framework and ANCIL (Coonan et al., 2018). The CILIP revised definition reads as follows:

“Information literacy is the ability to think critically and make balanced judgements about any information we find and use. It empowers us as citizens to reach and express informed views and to engage fully with society” (Coonan et al., 2018, p.3).

Landøy, Popa and Repanovici (2020, p. 24) summarised the updated CILIP definitions in several points, including critical thinking and discernment, reflecting more nuanced definitions of recent years, focusing on context, individual agency, empowerment of citizens and no generic sets of skills and abilities to be acquired. The revised CILIP definition is an example of definitions that see IL as *a way of thinking* categorisation that requires focusing on cognitive and mental processes of information and is not simply the exhibition of a cluster of skills or showing abstract knowledge. Sample (2020) states that this kind of definition- *a way of thinking*- is situated in the essence of the process models such as Kuhlthaus's Information Search Process (ISP) and learning models like Problem-Based Learning (PBL). In addition, *a way of thinking* about IL definition is quickly adopted from the perspective of IL standards-based outcomes. However, the adherents of this kind of definition may neglect the sociocultural aspects of IL practices, concentrating only on peer-reviewed and omitting other information and disciplinary sources.

Johnston and Webber (2003) go beyond the idea of viewing IL from a narrow perspective of basic skills, or "library skills. " They believe that IL can have a positive role on information in society, in terms of cultural, social and economic aspects, and thus they defined IL as:

"the adoption of appropriate information behaviour to obtain, through whatever channel or medium, information well fitted to information needs, together with a critical awareness of the importance of wise and ethical use of information in society" (Johnston & Webber, 2003, p.336).

The development of the IL definition has not stopped. Bruce (1997) was the first researcher to use a phenomenographic approach to understanding IL from different perspectives that conceive IL as a concept rather than competency-based definitions, as alluded to above. Bruce developed their relational model through which IL is seen as a subjective experience but contextualised. This revealed the various roles and functions played by IL in the information users' lives. In Bruce's study, IL is experienced as:

1. use of Information Technology
2. knowing what information sources to use
3. Knowing processes to search those sources
4. Information control: having information stored and easily to hand
5. Knowledge construction: building a personal knowledge base
6. Knowledge extension: combining knowledge and personal perspectives to create new insights
7. Wisdom: using information wisely to benefit others, exercising judgment, making decisions, researching, and placing the information in a broader context.

The influential work of Bruce's "relational" model treated and described IL as a concept and phenomenon rather than a competency. This illuminates and helps to broadly understand the varying roles and functions of IL in information users' lives and how IL is understood and described in different contexts as *a category of way of thinking*. The phenomenographic approach Bruce took has also inspired other seminal studies investigating IL experiences in different contexts for different individual groups as follows.

Boon et al. (2007) also adopted a phenomenographic approach to identify how English academics in the UK universities conceptualise IL. They found that the academics described IL in four different categories. IL is experienced as:

1. Accessing and retrieving textual information,
2. Using ICT to access and retrieve information,
3. Possessing basic research skills and knowing how and when to use them, and
4. Becoming confident autonomous learners and critical thinkers (p. 214-218).

Their findings suggest that "the academics described conceptions of information literacy ranging from lower order, emphasising access and retrieval skills, to higher order, emphasising autonomous learning, critical thinking and personal development" (p. 224).

IL conceptions are also investigated outside of the HE context. Forster (2015a) phenomenographically investigated how IL is conceived by nurses as a profession within the context of EBP approach. Information literate nurses are described in six different categories as follows:

1. The passive minimalist,
2. The knowledgeable goal achiever,
3. The focused, competent and evolving professional,
4. The confident and trusted promoter of justifiable change,
5. The teacher and promoter of an evidence-based culture, and
6. The leader, philosopher and strategist (p. 199).

The above categories indicate that IL "is a pervasive element within nursing practice; information use appears to play a role in many, even most, aspects of a nurse's role. In fact information literacy seems to be essential to effective NURSING practice at whatever level" (p. 199). The categories identified by Bruce (1997), Boon et al. (2007) and Forster (2015a) will be described in more depth in the discussion chapter (section 10.2.5), where they are compared in detail to the findings of the current study.

The adoption of new theoretical and philosophical perspectives, such as practice theory and site ontology, was first introduced by Lloyd's (2010, 2012) work to frame IL as social practice. This view situates IL in its social context and setting, where other interwoven practices and activities directly affect how IL should be conceptualised. Lloyd shed much light on the

importance of contextual factors and social settings where IL is experienced and practised. Therefore, Lloyd suggests a much more robust foundation for understanding IL based on practice theory where its practices “cannot be easily transferred from site to site as if they were objective constructs” (Whitworth, 2020, p. 9). This means that IL practices do not necessarily fit in all workplaces and sites in the same way. Lloyd (2012) argues that using sociocultural constructs to analyse the IL phenomenon enables us to understand how and why IL exhibits itself differently in different settings in ways that are prefigured to help those participating in the continuing practices in the same setting. This led Lloyd to propose the perspective of *people-in-practice*, which focuses on the idea that social aspects are central to forming IL. Through this perspective, a broader description of IL is presented as a practice that enhances critical thinking since it builds a way of knowing about:

- how information is enabled, afforded, nuanced, or contested within a setting;
- the modalities of information that are considered credible and authoritative to the setting;
- how to operationalise the appropriate information skills to access information and knowledge of the setting; and
- how to “go on” in the performance of learning or working (Lloyd, 2012).

Lloyd (2006) argues that framing IL within the definition-based skills and attributes would limit our understanding of how it is conceptualised differently according to various social settings. This motivated Lloyd (2017) to develop her model of IL through which IL is defined as:

“a practice that is enacted in a social setting. It comprises a set of activities and skills referencing structured and embodied knowledge and ways of knowing relevant to the context. Information literacy is a way of knowing” (p.94).

Lloyd (2006) widens the traditional IL definition, using skills-based IL concepts, which is typically applied in the HE context, to focus not only on academic context but going further to include other different contexts such as workplace. In the above definition Lloyd highlights the importance of social setting in structuring IL practices. She also emphasises how information is embodied: information is contained in and expressed through the body, so that the body has a role in understanding information and forming knowledge in specific context. In this definition, therefore, the focus is not only how to identify and access information through structured systems but to consider people’s embodied experiences when interacting with information.

This definition is grouped under the third category proposed by Addison and Meyers' (2013) framework that views IL as *a social phenomenon or practice*. From this perspective, individuals undertake unique activities to connect them with different information modalities (e.g. corporeal, social, epistemic) that form the information landscape of their settings (Lloyd, 2010, 2012). This means that each phase has its unique features, which may reflect specific practices of IL within the information landscape constituted by various information forms upon which medical students draw in the performance of their practices.

IL is described as a “fluid concept” shaped by our experiences and developed in a complicated information environment. Therefore, it is suggested that continuous modification needs to be conducted on IL models and frameworks in order to meet the sustainable changes of the concepts (Martin, 2013, p.3). This leads us to carefully consider the concepts of IL based on the literature examination in two settings: the Arabic region (Salha, 2011; Al-Issa, 2013) and medicine as a complex disciplinary context (Saranto & Hovenga, 2004) prior to discussing the notion of IL model and framework development and their influences on the medical students' learning and progression. These different practices of IL within each phase reflect the complicated nature of the medical context.

2.2.1.1. The concept of information literacy within the medical and healthcare field

Despite IL being a contextual and disciplinary phenomenon, it has mostly been studied within LIS and across educational sectors. This could result in trapping the conceptualisation of IL “between a rock and a hard place,” as stated by Lloyd (2011). Hence, Lloyd encourages librarians to explore IL and its practices in other contexts in order to understand the role of IL in learning outside the standard settings (Lloyd, 2005). The unfamiliarity of the concept of IL motivated Hicks et al. (2022) in their recent study to examine how the IL concept has been leveraged outside LIS disciplinary landscape by mapping it against Public Health and Nursing among the other three disciplines: higher education, psychology, management and business. For example, within the nursing field, they found that the IL concept is closely linked to the EBP approach, which is seen as a central skill-based competency. Therefore, they suggest an implication for IL researchers that they publish and investigate IL outside LIS venues to ensure its sustainability and impact in other disciplines.

Saranto and Hovenga (2004) reviewed the literature to see how IL is defined and presented in the context of health, nursing and medical informatics. It has been found that IL as a concept is still obscure, and it is not used in the discourse of such disciplines. However, synonyms such as “computer literacy”, “informatics awareness”, and “computer experience” are used as

alternative concepts. In addition, most reviewed publications uncovered that IL is mostly discussed in the USA, Australia and other European countries. In the same vein, Aharony (2010) found that IL is still an ambiguous concept and has multiple features in the context of health and medicine, as well as being confused with other various concepts. Therefore, Aharony encouraged the LIS professionals who are working in the medical setting to investigate this concept within the medical discipline in order to expose medical staff to the significance of the concept, particularly in a context where information is overloaded, and the misinformation phenomenon has become much more common. Also, they found that no paper has been published within the Arabic context, with only one article published in the Arabic language.

The reason for the ambiguity of the IL concept within the medical and health field could refer to the robust notion of health literacy (HL) in such a context. HL can be thought of as an individual's capacities to meet the complex health demands in a modern community (Sørensen et al., 2012). It is argued that there is no consensus about the HL definition or its conceptual dimensions, and therefore, Sørensen et al. (2012) reviewed the literature concerning HL definitions and models. The review revealed that there are 17 definitions of HL. Nutbeam (2009, p. 304) restates the validity of their original definition, which is used as a standard definition of HL as "the capacity to acquire, understand and use information in ways which promote and maintain good health remain". Haruna and Hu (2018) state that HL is a relatively new term within the domain of LIS compared to healthcare settings. Notably, it focuses on the health of the citizen rather than more broadly on the IL of doctors in treating patients, and the instruments that have been developed for HL focus on measuring how HL a population is in several dimensions: healthcare, disease prevention and health promotion respectively (Sørensen et al., 2012). In order to understand the significance of IL in the healthcare context, the Medical Library Association formed the concept of health information literacy in 2003. This is a combination of HL and IL terms as working definitions in the setting of healthcare:

"the set of abilities needed to recognise a health information need, identify likely information sources and use them to retrieve relevant information, assess the quality of the information and its applicability to a specific situation, and analyse, understand, and use the information to make good health decisions" (Haruna & Hu, 2018, p. 300).

As mentioned, IL can manifest itself differently based on the discipline and context where it is experienced and practised. Hence, Pinto et al. (2014) explored the practices of IL in two different disciplinary areas: health and social sciences. It has been found that IL has specific

characteristics in each of the two disciplines, which confirms the idea of the existence of “discipline dependence”. The inconsistency of the term IL outside the LIS field could be referred to as the reason suggested by Hicks et al. (2022, p.13) that IL is “perhaps still seen as too vague by authors who are writing from outside LIS, who often seem to focus on specific components of information literacy, such as information-seeking or digital competence” which would constrain its adoption in the other disciplinary discourses and domains. This is one of the rationales that motivated the researcher of this study to discover IL concepts within the context of the FOM at KU, which have not been explored previously.

2.2.2. Models and standards of information literacy

There is a wide range of IL frameworks developed around the world. The attention here will be focused on the models (SCONUL and ACRL) which the literature most often identifies as used in the GCC context (Ashoor, 2005; Pullman, 2016; Russel & Houlihan, 2017; Sandercock, 2016). Although these models are developed in English-language-speaking countries, the reviewed literature revealed that HE institutions in the Arabic region and GCC mostly use these models to design their IL instructional programs.. The ACRL Standards were the predecessor of the ACRL Framework, which was renewed in 2016. It is worth mentioning here because the HE institutions are still using it in the context of GCC. In addition, much more light will be shed on the SCONUL model because it has been used as an analytical framework for this study.

2.2.2.1. Association of college and research libraries (ACRL) information literacy competency standards, 2000

In 2000, the ACRL, a division of the ALA, designed “information literacy competency standards for higher education” in the HE context of the USA. This document encompasses five standards with several performance indicators and learning outcomes. It was translated into many languages. Its influence on most of HE institutions’ IL instructional practices all over the world is recognised in the literature, providing the essential needs for developing information-literate individual who can:

- determines the nature and extent of the information needed;
- accesses needed information effectively and efficiently
- evaluates information and its sources critically and incorporates selected information into his or her knowledge base and value system;
- uses information effectively to accomplish a specific purpose;
- understands many economic, legal, and social issues surrounding the use of information and accesses and uses information ethically and legally (ACRL, 2000, p. 2-3).

The standards have led other educational institutions to develop IL models and standards. For example, the second edition of "Australian and New Zealand Information Literacy Framework: Principles, standards and Practices", known as ANZIL, published in 2003, was developed based on the structure of ACRL 2000 standards in order to support IL programs in Australia at all levels (Bundy, 2004). Regarding the adoption of the ACRL standards in the GCC will be discussed later.

The typical approach to the standards is based on the perspective of behavioural theory (Forster, 2015a). Hence, in this approach, information literate people “must exhibit certain characteristics and demonstrate certain abilities’, so there is an emphasis on measurable skills” (Webber & Johnston, 2000, p. 385). As Sample (2020) states, the structure of the standards’ skills is drawn from Bloom’s taxonomy of educational objectives, where they have been divided into lower and higher-order thinking skills. For instance, determining the extent of information needed is categorised as a lower-order cognitive skill. In contrast, the capability of incorporating selected information into one’s knowledge base belongs to higher-order skills. The standards provide the faculty and librarians with a range of learning outcomes that contribute to assessing the student's progress towards IL. The ease of assessment is regarded as one of the most significant advantages that serves as a straightforward means that has enabled librarians to communicate with various stakeholders (Sample, 2020). However, the ACRL standards also have significant drawbacks. It is argued that the “tick box” approach to education adopted by the standards leads to fragmenting the knowledge into small units and thus reflects surface learning instead of deep learning in which students are required to make sense of the content and develop a personal understanding through linking concepts to experiences (Webber & Johnston, 2000; Johnston & Webber, 2003). Another drawback is related to its linear sequence of acts approach. It is challenged by those who view research as an iterative process because teaching research and writing sequentially could have several detrimental impacts (Sample, 2020).

2.2.2.2. Association of college and research libraries (ACRL) the framework for information literacy for higher education, 2016

In January 2016, ACRL (2016) released the framework for IL, which came as a result of the replacement of ACRL standards (2000) for IL. In contrast to the standards which embrace a positivist approach describing IL as a set of skills, the framework which adopts social constructivist philosophy defines IL as a social practice (Foasberg, 2015). In the introduction of the framework, it is stated that “The Framework is called a framework intentionally because

it is based on a cluster of interconnected core concepts, with flexible options for implementation, rather than on a set of standards or learning outcomes, or any prescriptive enumeration of skills” (ACRL, 2016, p.7). The framework comprises six frames, which are built upon conceptual understandings. These frames are central to the IL concept:

- Authority Is Constructed and Contextual
- Information Creation as a Process
- Information Has Value
- Research as Inquiry
- Scholarship as Conversation
- Searching as Strategic Exploration (ACRL, 2016, p. 8).

Each frame is attached with knowledge practices that are “used to demonstrate how the mastery of the concept leads to application in new situations and knowledge generation” and “a set of dispositions that address the affective areas of learning” (ACRL, 2016, p.26). The framework is also influenced by threshold concepts that are essential in developing curricula and help to explain the situated perspective of the framework on IL. As defined by Meyer and Land (2005, p. 3) “a threshold concept can be considered as akin to a portal, opening up a new and previously inaccessible way of thinking about something. It represents a transformed way of understanding, or interpreting, or viewing something without which the learner cannot progress”. Threshold concepts are regarded as “those ideas in any discipline that are passageways or portals to enlarged understanding or ways of thinking and practicing within that discipline” (ACRL, 2016, p.7). They may be grounded in the disciplinary practices that experts are not able to clearly outline or even realise their existence (Conor, 2017). Unlike the standards in which information is assumed as objective and measurable existing in information artefacts themselves, information in the framework is viewed as a social phenomenon generated and understood in specific communities (Foasberg, 2015). However, the framework, as a product of ACRL, still places a heavy focus on academic context, and thus, understanding of IL in other contexts remains uncovered in the document (Foasberg, 2015). Latham, Gross and Julien (2019) conducted an exploratory study to investigate several librarians’ perceptions and experiences regarding implementing the framework in their IL instructions within the HE context in the USA. They found resistance from some librarians and faculties regarding designing their IL teaching sessions. This is because they feel the framework is too highly conceptual to be understood by the students, particularly those who lack the basic IL skills. They indicated that the learning outcomes are difficult to assess based on the framework. Similarly, Schulte Knapp (2017) designed a survey to see how academic medical and hospital

librarians have used the ACRL framework in their IL teaching practices. They found that more than half of the participants did not use the framework in their IL instructional practices because of a lack of awareness of a new version and a lack of engagement in formal teaching. At the same time, hospital librarians have no idea about ACRL.

2.2.2.3. The seven pillars of information literacy (SCONUL)

This model was published by the Society of College, National and University Libraries (SCONUL) in 2011 as an updated and expanded SCONUL (1999) to be used by librarians and educators to design their IL instructions in the HE context in the UK and the world. Gallacher (2009), for instance, conducted a survey to determine the number of HE institutions' libraries in the UK using the SCONUL 7 Pillars model and how they use it in their learning activities. The survey showed that the model was being quite widely used by most UK universities and colleges (40 HE institutions such as Russell Group Universities, Non-Russell Group Universities & HE Colleges) in a variety of contexts and ways including: underpinning the design of IL programme, providing framework for online IL module, used in strategy and policy documents, used for learning outcomes or competencies, linked to IL quiz, and used for discussion and as a starting point for developing IL.

The standard approach to the SCONUL structure is a competency-based model based on a mixture of theoretical perspectives: constructivist and behaviourist (Forster, 2015a). SCONUL (1999) has more about the progression aspect, but it does not describe each pillar in much detail; whereas, the revised SCONUL (2011) model has the detailed description of the seven pillars through giving a list of statements linked to a set of competencies and understandings. Thus, the development of being information literate is seen as a holistic, iterative and continuing process based on the seven pillars which comprise: identify, scope, plan, gather, evaluate, manage, and present, as shown in the following figure 2.1.

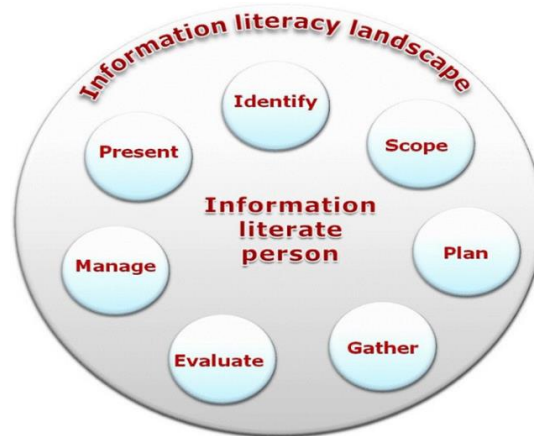


Figure 2-1 The Model of SCONUL Seven Pillars of Information Literacy (2011, p.4)

Lloyd (2017, p.94) argues that “landscapes are constituted through social, epistemic/instrumental and physical corporeal information modalities which reflect the stable and established knowledge domains of a social site (information environment)”. The landscape’s structure and organisation offers a range of opportunities for individuals to engage with information sources that give it a unique shape and character (Lloyd, 2006). This means that there are a variety of workplace landscapes in our world whose affordances are linked to a group of “opportunities, activities, symbols, artefacts and practices that the workplace as a space, and the people who work in that space, provide to facilitate learning and knowing” (Lloyd, 2006, p. 572). Accordingly, different skills, affordances and practices are needed to make these naturally various landscapes accessible and knowable (Lloyd, 2006). As described in the figure above, the SCONUL Work Group expands the seven pillars model on the information landscape and its influence on IL development within the structure of the SCONUL model (Martin, 2013). The IL landscape in the SCONUL model also considers an individual’s “aptitude, background and experiences, which will affect how they respond to any information literacy development” (SCONUL, 2011, p. 4). The concept of information landscape and IL landscape are against the notion of one-size-fits-all and a leaner approach to the development of IL. This is due to the fact that IL landscapes will be different because individuals have different experiences and attitudes that involve a variety of information landscapes. Thus, the importance of landscape concept in understanding IL is seen as a structural basis on which the seven pillars were built (Martin, 2013).

A range of skills and competencies (ability) and attitudes and behaviours (understanding) are situated at the centre of each pillar in the revised model. These pillars are seen as a “three-

dimensional circular” structure built on an information landscape comprising the world of information in which an individual perceives it at that point in time (Bent & Stubbings, 2011). This means that “a person can develop within several pillars simultaneously and independently, although in practice they are often closely linked” (SCONUL, 2011, p. 4). Due to the constant changes in the information landscape, individuals can likely progress from novice to expert by moving down a pillar and up it (SCONUL, 2011). Their progression in each pillar may be different based on the kind of the context, their learning levels and ages and is also relying on experience and information needed (Bent & Stubbings, 2011).

A foundation is provided by the core model for HE to articulate general learning outcomes for the seven pillars of IL (Martin, 2013). Bent and Stubbings (2011, p.1) argue that “The new model is meant to be organic and to be changed and adapted to meet the needs of different groups of learners and to be relevant in different contexts”. Therefore, the core model is designed to be used by different individual groups and applied in specific situations through devising a series of lenses. These flexible lenses enable the model to be welcomed by different user groups in different contexts (SCONUL, 2011). As result, *a Research, an Open Content and a Digital Literacy Lenses* have been included (Martin, 2013). Also these lenses underpin the notion of IL as a comprehensive term where it encompasses many concepts such as “digital literacy, information handling, information skills, data curation and data management, to name just a few” (Bent & Stubbings, 2011, p.1). Additional lenses are hoped to be developed by practitioners in the larger community, even though the initial documents linked to the revised pillars were created by the SCONUL Working Group on IL (Martin, 2013).

The reviewed literature revealed that there are adherents and opponents to the revised SCONUL 2011 model structure as a reliable and trustworthy IL learning and theoretical framework. Goldstein (2015a) conducted a small-scale review and analysis of the revised version of the SCONUL model to investigate its value as a resource. In order to ensure the model’s sustainability, Goldstein suggested that it should be more flexible about its “seven-pronged structure” since it was initially designed for the needs of HE and was not necessarily suitable in other domains. In addition, a critique was made by Secker and Coonan (2011) that the SCONUL seven-pillar model has reduced a wide range of higher-order cognitive and thinking skills to one pillar. Aspects such as synthesising, knowledge creation, summarising and attributing are all subsumed into the “Present” pillar, while skills comprising identifying, scoping and seeking information are distributed into four pillars.

Walton (2017, p. 138) has criticised the revised 2011 SCONUL model in terms of its approach and structure, stating that “even the revised model (SCONUL, 2011) lacks a great deal of the cognitive, emotional and recursive states inherent in engaging with information. The pillar schema is an engaging metaphor, admittedly, but it creates a misleading picture in people’s minds of the IL process as an almost concrete and fixed set of stages”. Conversely, McKinney and Sen (2012) have confirmed the usefulness of the revised seven pillars model (SCONUL 2011) as a holistic analytical framework and as a lens for analysing their research project data derived from their participants’ reflection assignments because of its detailed descriptions of IL aspects. They argued that “in mapping our students’ reflections against the model we can further validate the model by giving example of the understandings and abilities described in the model” (p. 125). Thus, they highly recommended it in the HE setting. Similarly, Farzad et al. (2014) employed the SCONUL model as an analytical framework with the aim of developing their questionnaire in order to measure the rate of IL abilities among health services students in Jundishapur University of Medical Sciences in Iran. In the same vein, Gowri and Padma (2018) used the SCONUL model as a lens for measuring the engineering students’ IL skills in order to decide where the students stand as better information literates who face the growing challenges in both engineering education and the professional world in India. The SCONUL model has been found as an effective analytical tool that is able to determine the IL competencies of the students within engineering context. A broadly similar argument has also recently been made by Lockerbie and Williams (2019), who used the SCONUL model as a theoretical framework to analyse IL in a small business environment. They found the model helpful, and its core abilities and understandings are somewhat transferable to other workplaces.

The reviewed literature also uncovered a debate about the possibility of using the SCONUL model outside the context of the UK. Jinadu and Kaur (2014) examined a range of IL models and frameworks developed in Western societies, where SCONUL Seven Pillars (2011) model is one of them, to identify to what extent they are applicable and relevant to practises in the workplace particularly in developing countries in Africa. They found that the revised SCONUL model does not support the development of IL within the context of the workplace in developing countries. They argue that the SCONUL model places much emphasis on finding information only available online but there is no attention to developing skills that encourage and facilitate the access to non-documented and oral information which are critical within such contexts. In contrast, OSHIRO (2008) conducted a comparison and contrast study of six IL

models and frameworks devised in Western contexts including ACRL, Bruce's Seven Faces model and the SCONUL Seven Pillars model. It has been concluded that the SCONUL model is considered relevant outside the UK and is the most suitable to be used in the context of Japan. For the present study, the SCONUL model has been employed as a guiding framework for many reasons mentioned in the methodology chapter (see section 3.3.2) in analysing part of the existing research data.

2.3. The value of information literacy models and frameworks

Models, which can take the form of standards, guidelines and frameworks, have a significant role in implementing and promoting IL by providing practitioners a departure point to develop and assess their learning interventions in the HE context (Martine, 2013). The term model is defined as a “documentation that provides guidance and support in the understanding, development, and implementation of information literacy” (Martin, 2013, p. 117). The importance of IL models and frameworks is summarised in the following quotation extracted from the ACRL framework (2016):

“The Framework is a mechanism for guiding the development of information literacy programs within higher education institutions while promoting discussion about the nature of key concepts in information in general education and disciplinary studies. The Framework encourages thinking about how librarians, faculty, and others can address core or portal concepts and associated elements in the information field within the context of higher education. The Framework will help librarians contextualise and integrate information literacy for their institutions and encourage a deeper understanding of what knowledge practices and dispositions an information-literate student should develop. The Framework redefines the boundaries of what librarians teach and how they conceptualise the study of information within the curricula of higher education institutions” (p.24).

This confirms the statement that the instructional practices of IL should be contextualised because each discipline has its specifics. Thus, they must be taken into account by the librarians when designing IL programs (Golenko & Arh, 2020). ACRL standards 2000 played a significant role in enhancing IL practices in the context of HE for decades. It enabled HE institutions to place IL as a core learning outcome in the curriculum. It encouraged relationships with general education programs, PBL, service learning and other pedagogies concentrated on deeper learning (ACRL, 2016). Golenko and Arh (2020) reviewed the literature to point to the most significant IL models and standards in the field of medicine in the world. They concluded that the explored models and standards provide a holistic picture of how IL should be experienced and an understanding of information used to make learning possible. Also, on a

practical level, it has been found that these surveyed models and standards are essential in promoting IL practices in medical libraries and can serve as theoretical frameworks for designing formal IL programs. The evidence presented in this section indicates that IL models and standards play a significant role from several perspectives, including guidance in creating IL instructional programs in HE institutions, promoting the collaboration between librarians and faculty, promoting the integration of IL competencies in the curriculum and clarifying how IL is conceptualised in each disciplinary studies.

2.4. Librarians' identity as teachers

The reviewed literature revealed a common topic in the research literature is that of how librarians appreciate and adopt the instruction role as an integral part of their professional identity (e.g. Becksford, 2022; Kirker, 2022; Wheeler & McKinney, 2015). The idea of embracing librarian-teacher identity has become critical to academic librarians after recognising the increasing need for IL instructions within HE setting (Kirker, 2022). However, there are varying beliefs held by academic librarians in relation to their teaching role (Cadogan et. al., 2023). Wheeler and McKinney (2015), who used a phenomenographic approach, found that librarians describe themselves in four categories: teacher-librarian, learning support, librarian who teaches and trainer. Librarians in each category hold different beliefs in relation to the teaching role they perform. For example, in the teacher-librarians category, they perceive that they do the same job as a teacher does, while those who view themselves as trainers have a negative perception regarding their teaching activities and do not want to view themselves as teachers. In the same vein, Kirker (2022), who analysed interviews with academic librarians, found that librarians view themselves as teacher-librarians, librarians who teach and those who do not teach. It has been noted that the respondents are reluctant to describe themselves as teachers because of both their deeply grounded identity as librarians and teaching faculty's attitudes towards them.

In the study of Wheeler and McKinney (2015), the reasons for those who do not call themselves teacher refer to their thought that teaching requires high-level qualifications and specific kind of skills and abilities, or something related to the organisational structure of their affiliated institutions which impacts the librarians' job descriptions. Hays and Studebaker (2019) argued that academic librarians lack sufficient teaching and learning knowledge which could be a key factor affecting their role in teaching IL and their perception of seeing themselves a teacher. Therefore, they examine the impact of involvement in the scholarship of teaching and learning on academic librarians' teacher identity. It has been found that having courses related to

improving teaching skills considered as professional development tools have a notable impact on seeing themselves as teachers in HE context, as librarians do not always have a background in education before becoming an academic librarian.

Public and social discourses also shape, reproduce and transform IL. They affect the language and activities that make the practice and the role ascribed to the practitioners (Lloyd, 2006). Therefore, Hicks and Lloyd (2022) examined two different professional narratives (IL models and frameworks & a range of book introductions) to demonstrate how IL practices are shaped within HE setting. They found that librarians' work identity as teacher is neglected in these discourses, or they are even described as incompetent and incapable to be effective in their role. This passive language could affect the role attributed to the librarians' profession and practice within a given context. Hicks and Lloyd (2022) argue that this type of discourses could constitute a barrier and create resistance “among teaching librarians who can be seen as attempting to rebuild their role within the community through sharing practical know-how and understanding” (p. 422).

The relationship between the librarians and faculty can play a significant part in reinforcing the idea that librarians are teachers. Kirker (2022) posits that many librarians depend on that time given to them by academics during class to teach IL, and they use this deferential language when describing their teaching role. This relationship leads to “constant negotiation of instructional responsibilities and impacts how librarians view their roles as teachers” (p. 338). To understand the situation of medical librarians' identity within the context of academic health sciences libraries, Linton (2016) distributed a survey to determine their role in the medical school curriculum development. It was found that identities such as educators, change agents, and problem solvers were identified by health sciences librarians as new emerging roles. The roles librarians played moved from a strictly supporting one to active partnering, collaboration, advocacy, and leadership. It can be concluded that librarians' teaching identity is complex and varies between librarians.

2.5. Information literacy in the Arabic world

Since the IL concept coinage by Paul G. Zurkowski (1974), the movement of IL has been increasingly developing and proliferating, particularly within Western societies and the English-speaking countries (the USA, the UK, Canada, Australia and New Zealand). However, the situation is different in other regions worldwide where there is little existing literature dealing with implementing IL instructions in non-English speaking countries (Simon, 2013), including Arabic countries. This section will cover the IL movement in the Arabic region and

GCC context. Given the sharing of the same culture, values, language, educational background and other sociocultural aspects, the nature of IL practices and literature findings in this region and GCC context would equally apply and be of more relevance to the Kuwait setting.

The Arabic region is no exception, where a dearth of literature concerning IL in HE institutions has been found in the Arab world (Azmi, 2006). This statement is in line with the findings of a recent bibliometric analysis of three global journals dedicated to IL research, including *Communications in Information Literacy* (the USA), *Journal of Information Literacy* (the UK), and the *Nordic Journal of Information Literacy in Higher Education* (Norway), from 2012 to 2017 conducted by Tokarz and Bucy (2019). It has been identified that Western societies predominantly publish the most articles that contribute to the IL research literature globally on multiple themes, with minimal participation from Arabic countries. Although this analysis was confined only to three journals and a specific period, it provides, to some extent, concrete evidence that reflects the reality of IL practices within HE in the Arabic world.

During a high-level workshop, “Training the trainers,” sponsored by UNESCO in Egypt in 2008, it was reported that high degrees of access to web materials and the internet have been witnessed in the Arabic world. However, the majority of Arabic students and information professionals lack the necessary IL skills that enable them to conduct effective and efficient searches, in particular when approaching information resources in Arabic (Fahmy & Rifaat, 2010). This deficiency is attributed to many factors and challenges, which will be discussed in detail in a separate section below (see 2.4.3.).

Due to the increasing significance of IL instruction within the academic context, Al-Aufi and Al-Azri (2013) emphasised the need for more research studies pertaining to IL in the context of Arab countries. The majority of Arabic works written in the English language take the format of articles strongly associated with specific programmes and standards commonly utilised within a wide range of nations (Houlihan et al., 2016). The study from Klaib (2009) also found a gap between the theoretical and practical objectives achieved by the IL instructions conducted in several Jordan universities.

2.5.1. Information literacy pedagogical practices in higher education institutions of the GCC

This section explores the most significant IL practices in the HE context, as well as the latest initiatives that encourage and support the development of IL in the GCC region, of which Kuwait is a part.

Economic growth accompanied by increased interest in establishing HE institutions in the GCC has led to attracting the non-national universities and colleges in this region, which in turn has resulted in adopting IL models developed in Western contexts. The academic libraries' culture has also been influenced by significant changes where most librarians are expatriates who graduated from Western universities. These librarians brought their IL experiences and applied them to a different context, situation and place (Russel & Houlihan, 2017). Expat librarians are seriously attempting to integrate ACRL standards and other Western models to design IL teaching programmes and activities. Based on the reviewed literature, ACRL standards are widely used in most United Arab Emirates (UAE) universities to enhance and improve the current IL programmes and activities and to reinforce IL initiatives as a crucial component in the academic context (Houlihan et al., 2016; Moyo & Mavodza, 2016; Russel & Houlihan, 2017).

Other Western IL practices have been found, particularly in Qatar. The College of the North Atlantic in Qatar (CAN-Q) adopts the SCOUNL (2011) model to foster and enhance the IL skills and competencies of students through one-shot sessions (Sandercock, 2016). The University of Carnegie Mellon (CMUQ) applies ACRL standards as a framework for delivering IL competencies and skills to students through various methods, such as face-to-face, online, and via Blackboard (Pullman, 2016).

Another significant initiative has been launched in the UAE as an informal organisation called the Information Literacy Network (ILN). It was established by expat librarians interested in fostering and sharing IL news and resources in the GCC setting (retrieved from <https://iln-gulf.org/>). It strives to develop IL practices in the context of the GCC by organising relevant conferences and workshops and providing stakeholders with relevant professional development programmes (Birks & Eula, 2011).

At the level of national universities, several online or face-to-face IL courses and programmes have been developed. They are guided by ACRL standards, with some modifications made in order to suit the local requirements of the academic community. For example, 'Infoasis' (retrieved from <https://www.zu.ac.ae/infoasis/>) has been implemented as a web-based IL tutorial at Zayed University (ZU) in the UAE (Martin et al., 2010). Another example of ILE derived from the context of GCC is that the academic library at King Fahad University of Petroleum and Minerals, Kingdom of Saudi Arabia, provides its users with IL programmes and instructions guided by Western-style methods and practices (Ashoor, 2005).

The evidence presented in this section suggests that the current IL practices in the majority of HE institutions in the Middle East and GCC are guided and shaped by Western IL models and frameworks (Houlihan et al., 2016; Sandercock, 2016; Martin et al., 2010; Pullman, 2016; Johnston et al., 2014; Shana & Ishtaiwa, 2013; Al-Aufi & Al-Azri, 2013; Ashoor, 2005), without taking into account the aspects associated with the cultural, linguistic and educational background of local students while developing and delivering IL content. This is because such institutions have not yet developed their own IL models, standards, and frameworks to meet their students' local needs (Russel & Houlihan, 2017). The following section presents a general overview of IL studies conducted in Kuwait.

2.5.2. Information literacy published literature in the higher education within Kuwait context
There is limited existing literature related to the status of IL within the context of HE in Kuwait. The College of Social Sciences at Kuwait University has tried to equip undergraduates with information skills through a formal three-credit course. This stimulated Rehman and Al-Awadhi (2011) to develop a systematic assessment instrument to determine how much this course was helpful and what impact it had on undergraduates' IL and research capabilities. It revealed that, at the end of the semester, the performance of the participants showed significant improvement in terms of computing skills and some IL capabilities. A follow-up qualitative study was conducted to fill the gap in previous studies and to gain an in-depth knowledge of IL (Al-Awadhi & Rehman, 2012). Several obstacles have been identified concerning the development of IL courses, including outdated content and a lack of support from leadership. IL teaching and learning is an iterative and cyclical process that requires updating continuously, as well as established cooperation among all stakeholders.

It was assumed that graduate students have a higher level of IL skills than undergraduates and are more able to find, select, evaluate and use information resources more effectively and efficiently due to their prior experience and robust background. However, it was unexpectedly found by many studies that their IL competencies were moderate relative to their status as graduate students (Al-Qallaf, 2019; Alkhezzi & Henda, 2018; Al-Muomen, 2009). They encounter difficulties determining suitable resources, especially when resources require developing more complex search strategies (Al-Qallaf, 2019; Alkhezzi & Henda, 2018; Al-Muomen, 2009). This may be attributed to the weakness or absence of IL programmes and initiatives within the context of KU that are based on national and international standards and experiences.

Al-Issa (2013) conducted an empirical qualitative study to seek how undergraduate students attending public and private universities in Kuwait experience and understand IL. Three standards derived from the ACRL 2000 framework were used to help the students reflect on their IL understandings and experiences. However, it was found that the concept of IL is articulated in limited aspects and exhibited in a fragmented manner. This could be because the study sample size is small, and the phenomena are explored from one perspective with limited data sources.

It is apparent from the literature that what we know about the IL phenomenon in Kuwait is primarily based on quantitative studies. Therefore, this research aims to investigate the phenomenon under study qualitatively from multiple perspectives in its real-life setting.

2.5.3. Challenges of information literacy development in the Arabic & the GCC context

The reviewed literature has revealed challenges encountered in developing IL practices or even the level of IL in the Middle East region and the GCC context in particular. These challenges and problematic constraints are closely related to educational systems, a low level of publication and literacy (Ashoor, 2005), cultural background and linguistic barriers (Fahmy & Rifaat, 2010), and the political situation (Houlihan et al., 2016).

2.5.3.1. Cultural background

There is a wide recognition that cultural background has significant influence on the students' attitudes to learning (Hofstede, 2002). Culture is defined as “the beliefs, value systems, norms, mores, myths, and structural elements of a given organisation, tribe, or society” (Collis, 1999, p.201). Sitzman and Eichelberger as cited in Al-motawah (2016, p. 67) define the aspects of culture as “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”. Hofstede (2002) divides the cultural aspects into four dimensions as summarised in table 2.3. Hofstede found that Arabic countries have a very high level of power distance and relatively high degree of uncertainty avoidance dimensions compared to the Western countries where the level of individualism is very high. Within the context of education, it has been concluded that in a society with a high rate of power distance, the learning process is teacher-centred and typically there is a need for fact memorisation and rote learning. If uncertainty avoidance is high, both students and teachers prefer educational situations in which learning is structured with specific learning objectives and detailed assignments.

In the context of ILE, Martin (2006) investigated the impact of cultural aspects, learning experiences and language competencies of Arabic students particularly in the UAE on teaching IL in an online setting. Due to the high level of power distance cultural dimension, the students seem to “give high credibility to anything written, and certainly to anything published in paper or electronic format” (p. 29). Also, because of the high degree of uncertainty avoidance of Arabic students, IL instructional programmes need to be designed to include more teacher-controlled and task-directed learning than would be usual in Western HE institutions.

Dimension	Description
power distance	“The extent to which the less powerful members of organizations and institutions accept and expect that power is distributed unequally”.
individualism	It is the opposite to collectivism, it is “the degree to which individuals are supposed to look after themselves or remain integrated into groups, usually around the family”
masculinity	It is opposite to femininity that “refers to the distribution of emotional roles between the genders”
uncertainty avoidance	“the extent to which a culture programs its members to feel either comfortable or uncomfortable in unstructured situations”

Table 2-3 Hofstede’s four cultural dimensions (adapted from Hofstede, 2002, p. xix-xx)

The issue of cultural variation has been mentioned within the IL literature for more than a decade; for instance, Johnston and Webber (2005, p.112) placed much emphasis on the importance of the cultural aspect in shaping the personality of being information literate, stating that:

“In terms of local and national culture, the information literate person is a self- and socially-conscious being rather than a simple repository of skills and knowledge. This is underlined by cross-cultural difference, where issues of behaviour and acceptability of kinds of information become sensitive”.

ILE is widely described in specific regions and nations where English is the predominant language and Western culture is the most familiar. However, the issues associated with national and cultural variations in other countries are not addressed (Robinson & Bawden, 2018). The terms multi-lingual and multi-cultural are considered comprehensive and encompass various settings and issues. Focusing on such issues concerning IL practices may help adapt IL teaching programmes to various groups and contribute to promoting the concept of IL to various

segments of students whose culture is different from the Western traditions and for whom their first language is not English (Nowrin et al., 2019).

As noted, many IL models and frameworks are inherently rooted and developed in Western countries. It is argued that these models are unlikely to be appropriate and applicable to all cultures and societies such as GCC and Arabic countries due to contextual and cultural variables. These variables must be considered when teaching IL as they affect how people learn in such nations (Dorner & Gorman, 2006; Dorner, 2017). The considerations of using Western IL models in designing ILE interventions in culturally different contexts (e.g. Arabic countries) is explicitly noted by Fahmy and Rifaat (2010, p. 113), who state that “there is no fixed single template for teaching to all audiences always comes up”. In the same vein, Dorner and Gorman (2006), who adopt Hofstede’s cultural dimensions as theoretical background, have criticised the previous ACRL definition of IL that was built on the behaviourist philosophy. This philosophy adopts positivist approach through which IL is seen as a list of universal skills and information is viewed as a commodity and thus ACRL standards express their definition of IL as a set of observable behaviours (Foasberg, 2015). ACRL standards followed a “linear deductive-style process” approach. Thus, it is assumed that not all learners in developing nations must pursue the same fashion in learning IL due to contextual and cultural differences (Dorner & Gorman, 2006). Dorner and Gorman (2006) were also criticising Bloom's taxonomy as being rooted in a Western way of thinking, and including this argument is not so directly relevant to this literature review.

As mentioned above, most academic institutions in the GCC have widely adopted the prevailing Western IL models with a particular focus on the ACRL standards and SCOUNL model in designing their ILE programmes (Russel & Houlihan, 2017). However, some studies highlight the role of cultural factors when designing IL teaching and learning programmes using such IL models and frameworks in contexts where their culture is different from those in which Western IL models were developed (Martin, 2006; Moyo & Mavodza, 2016; Pullman, 2016). This situation prompted Pullman (2016), as an expat librarian and IL educator in the context of GCC, to ask a critical question about knowing the role and responsibility of IL teachers in a culture in which IL concepts are “not only unfamiliar but are considered a ‘foreign import,’ only recently becoming integrated into a culture” (p.55). Therefore, many studies emphasised the importance of making crucial changes to the IL models derived from Western contexts to be appropriately fitted with other contexts, such as that of the GCC, to meet local

needs (Fahmy & Rifaat, 2010; Martin et al., 2010; Moyo & Mavodza, 2016; Russell & Houlihan, 2017).

Another cultural challenge is concerned with the absence of a reading culture among Arabic individuals. Birks and Eula (2011) attributed this problem to two main factors: the lack of home and community libraries and the strong tendency towards oral customs, which could be seen as a deficiency of the Western IL models that focus on a print and online culture. Therefore, Martin (2006) points out that some considerations should be taken into account when designing online-based IL courses within GCC context for those whose culture is reluctant to read long texts and not critically evaluate what they read. It is suggested that IL content should involve more shorter textual paragraphs embedded with a wide variety of visual representations and pullet-points formats and avoid using complex and unnecessary language. Moyo and Mavodza (2016) state that the aim of IL programmes in the HE libraries in the UAE places much more emphasis on using the web materials effectively, which is seen as a part of enhancing digital competency, than encouraging students to read critically. Beyond the fact that the English language dominates most web and internet materials, it is further noted that most electronic information resources available to university students via library portals are also predominantly in English (Simon, 2013). This could also present a significant language problem as a cultural challenge to students whose first language is not English. As a result, it has been found that Arabic students tend to read short articles and simple texts in order to avoid reading materials that are geared towards Western audiences (Johnston et al., 2014).

2.5.3.2. Educational background

Educational systems are one of the biggest challenges that hinder the development of IL and instructional practices in the Arabic region. It is argued that the nature of educational systems applied in this region is primarily based on traditional teaching and learning approaches including: fact memorisation and rote learning, teacher-focused approach and using very limited information resources for learning (Martin, 2006). This method prevents students' abilities from developing their information skills in how to find, critically evaluate and use information ethically and professionally in the learning environments (Ashoor, 2005; Birks & Eula, 2011). Ashoor (2005) further argues that by adopting such an approach to teaching and learning, students will face several difficulties associated with critical thinking development and evaluation skills. Therefore, this would affect their ability to be independent learners, which is considered the core aim of almost all educational systems worldwide where IL plays a significant role in achieving learning outcomes. As a result, Birks and Eula (2011), as expat

librarians in the context of GCC, ignore the Arabic cultural context but instead, apply their Western-gained experience to design IL programs in higher institutions within the context of the GCC. They do not take into account the educational background that students graduate from as they lack vital skills such as critical thinking and problem-solving and deficiencies in the English language. Another educational reason may be related to the learning styles preferred by Arabic students. For example, librarians from ZU raised questions of why InfOasis, web-based IL tutorial designed and allocated to Emirati university students, is not optimally utilised outside the classroom. They point out that one of the educational reasons probably is associated with the students' learning style in which they prefer more to learn through visual and auditory instructions (Martin et al., 2010). Martin (2006) also found that students whose educational background inherent in the context of GCC are more likely to be comfortable with learning tasks that are more oriented and controlled particularly when they move from high school to university. In summary, IL models developed in societies whose culture is high level of individualism dimension of Hofstede's cultural framework may not be compatible with all educational situations like Arabic contexts where students are accustomed to the predominance of a teacher-centred approach, memorisation and repetition of facts methods, and rote-learning patterns. However, this does not mean that constructivist pedagogical approaches cannot be used (Martin, 2006).

2.5.3.3. Other constraints

Another challenge is associated with the low level of Arabic literature publication and, more specifically, the lack of native Arabic materials on the World Wide Web (Ashoor, 2005; Fahmy & Rifaat, 2010). Other critical factors that affect the development of IL in the Arabic context include a set of obstacles such as the lack of search engines in the Arabic language, a lack of electronic databases and searching difficulties, a lack of qualified Arabic information professionals who can search and retrieve the needed resources, particularly in Arabic databases; and a lack of IL funds (Fahmy & Rifaat, 2010). Another challenge is associated with the low level of Arabic literature publication and, more specifically, the lack of native Arabic materials on the World Wide Web (Ashoor, 2005; Fahmy & Rifaat, 2010). The lack of local and national librarians was highlighted as being a critical issue concerning IL improvements, in particular within the GCC countries. This is because of the limited professional bodies tailored to library and information science (LIS). Moreover, the idea of professional development for librarians is not seen as a high priority by some institutions in the GCC, which

seem to be, to a large extent, traditional in comparison to their Western counterparts (Birks & Eula, 2011).

Overall, there seems to be some evidence to indicate that the development of IL in the Arabic region and the context of GCC are influenced by many issues associated with educational, cultural, and language factors.

2.6. Education in medicine

2.6.1. Overview of medical education

Medical institutions worldwide, as well as at the FOM at KU, implement curriculums based on student-centred and self-directed learning principles through the integration of evidence-based medicine (EBM) and PBL strategy in order to better prepare health sciences students for the requirements of clinical settings after graduation (Kuwait University, n.d.-b; Maggio et al., 2016; Saparova & Nolan, 2016). It is stated that IL supports self-directed learning activities because it plays a significant role in such approaches (Santharoban & Premadasa, 2015). The following sections highlight the relationship between IL EBM and PBL and the role played in such strategies in the medical field.

2.6.2. Evidence-based medicine and information literacy

Over the last few decades, new educational approaches and teaching strategies have been introduced into medical education for postgraduate and undergraduate courses. One of these innovations is the adoption of EBM; health professionals have widely used this, and it has been applied in many medical schools (Costello, 2018; Eldermire et al., 2019; Maggio et al., 2016; Masic et al., 2008; Murray et al., 2020; Nicholson et al., 2020; Yammine, 2013). The terms EBM and evidence-based practice (EBP) are sometimes used in the literature as similar terminologies. EBP is a term used across practice fields, not just in healthcare, and may be used to emphasise the practical aspects of healthcare work. Thus, they are sometimes used interchangeably in the medical and healthcare literature. For this study, however, EBM terms will be used for the purpose of clarity.

Using such an approach in the educational field of medicine serves as a bridge between theoretical research and clinical practices. It thus establishes a strong connection between scientific medical research and patient health care (Yammine, 2013). In order to successfully pursue the process of EBM, five steps must be taken by medical students and practitioners, including formulating critical questions, finding the evidence, appraising the evidence, applying the evidence, and evaluating performance (Haines & Horrocks, 2006; Masic et al., 2008; Murray et al., 2020). Many health sciences librarians teach EBM skills without drawing

much attention to the tenet of IL. However, the capabilities of health professionals to ask questions in order to identify someone's health problems and then access the literature to retrieve the relevant evidence to solve this patient's problem are situated at the heart of IL (Smith, 2019). This leads us to investigate further a symbiotic relationship between the EBM approach and IL practices and the role IL plays in such approaches.

In recent years, the importance of IL skills has been widely recognised and reported on in various publications of almost all types of medical professions, including medicine, allied health sciences, pharmacy, nursing, public health, and veterinary (Eldermire et al., 2019; Forster, 2009; Janke et al., 2012; Kloda, 2008). Smith (2019), in a systematic review of published articles, found that IL in undergraduate health education courses is acknowledged as a specific kind of IL. It is used to understand the different health research methodologies, study designs and how IL symbiotically relates to the EBM approach (Smith, 2019). It has been noted that the main driver for the integration of IL into health science programmes at King's College London is the emergence of an EBP approach, where the ability to find and retrieve information needs is seen as a critical factor in the successful development of EBP programmes (Haines & Horrocks, 2006). IL is essential for medical students to maximise academic and clinical success, particularly within EBM.

IL skills have also been put forward for use by nursing students and veterinarians as a fundamental element for practising EBM effectively and efficiently to enable them to incorporate clinical evidence in the health decision-making process (Eldermire et al., 2019; Janke et al., 2012). Due to the importance of such approaches, the alignment of IL with EBM is preferred as a practical approach for delivering IL instruction within medical education programmes for undergraduates (Smith, 2019). IL competencies can work together with the systematic approach of EBM to make the best clinical decisions affecting patient care.

2.6.3. Problem-based learning and information literacy

Since PBL was introduced into the curriculum by McMaster University's Faculty of Health and Sciences in the late 1960s to train medical students, it has been widely adopted by most medical schools worldwide (Smith Macklin, 2001). In 2005, the FOM at KU introduced PBL as a constructivist approach to its whole curriculum (Kuwait University, 2019).

PBL is an educational strategy for learning while the students encounter real-world problems (Fosmire & Macklin, 2002; Hakkarainen & Poikela, 2010). According to Dodd (2007), the main idea of PBL revolves around expanding knowledge and understanding and not just

problem-solving. This approach is collaborative, whereby an interactive application and tools are used to support the full engagement of a group of students with actual or simulated problems (Smith Macklin, 2001). It is characterised as self-directed, learner-centeredness, small-group work and experiential learning (Hakkarainen & Poikela, 2010). PBL is considered to be one of several collaborative learning activities that are based on assumptions of sociocultural learning theories in which students within a cooperative environment can effectively develop their critical thinking and life-long learning skills (Wang, 2007).

Santharooban and Premadasa (2015) argue that to accomplish the goal of the PBL process, students must deal with information in every step of the PBL process of their model. This is confirmed by Eskola's (2005) study, conducted to see how medical students in two different teaching approaches (student-centred curriculum, such as PBL strategy and teacher-centred curriculum, like lecturing methods) experience IL. The results demonstrated that those who work in the PBL environment showed higher-order cognitive skills and more IL conceptions experienced than their counterparts who learn through traditional approaches to teaching. In the same vein, Dodd (2007) conducted a mixed-method study to explore how PBL strategy has influenced both the IL of students and the use of information resources in the veterinary college at Dublin University. It has been shown that IL skills play a significant role in the PBL strategy, enabling students to effectively gather a wide range of practical resources to integrate them into their knowledge. The IL skills also help students overcome the problem of time constraints that emerge from the nature of PBL. Medical students who show low levels of IL competency cannot access the information resources effectively for PBL.

The structure of the PBL process can be implemented in different ways. Thus, the steps of the PBL process can differ from one context to another. Santharooban and Premadasa (2015) propose eight steps for the PBL process applied within the context of the Faculty of Health-Care Sciences of Eastern University in Sri Lanka. These steps seem similar to those applied within the context of the FOM at KU. There are several PBL activities presented in their PBL process grouped into four phases, which are mapped against SCONUL's (2011) model pillars as summarised in Table 2.4.

PBL Processes Steps	PBL Activities	The SCONUL Seven Pillars of IL 2011
Introduction of trigger	<ul style="list-style-type: none"> ● Introduction of trigger ● Identification of Keywords ● Clarifying unfamiliar terms unfamiliar terms ● Brainstorming ● Identify gaps in knowledge ● Identification of learning needs ● Discussion related to learning needs ● Tutor provides further learning needs 	Identify Scope Plan
Identification of keywords		
Brainstorming		
Identification of learning needs		
Discussion		
Self-directed learning	<ul style="list-style-type: none"> ● Students engage in self-directed learning in the library and online ● Students make notes based on Learning needs 	Plan Gather
Presentation	<ul style="list-style-type: none"> ● Sharing information gathered in SDL with peers ● Formulating solutions in group ● Preparing presentation ● Presenting 	Evaluate Manage Present
Review	<ul style="list-style-type: none"> ● Peers, PBL tutor and reviewer give feedback ● Student evaluate themselves and reflect on their learning ● Students clarify further doubts ● Students take notes from the review of the resource person 	

Table 2-4 Steps of PBL model adapted from Santharooan & Premadasa (2015, p. 142) & SCONUL Seven Pillars of IL (2011)

It is evident from the table above and reiterated by Dodd (2007) that students engaged in PBL activities are required to develop specific information skills in order to participate in a problem-solving environment effectively. Smith Macklin (2001) believed that the skills required to achieve a successful PBL process, including fact gathering, identification and question-asking, problem statement formulation, information location and evaluation, and information retrieval, have much in common with the essence of IL concepts. Fosmire and Macklin (2002) confirmed that students of the PBL curriculum need to develop more sophisticated abilities that enable them to be more effective information users and consumers than those of a traditional learning approach.

The structure of the problem-solving process can be implemented in different ways. The model chosen here is the cyclical model developed by Santharooban and Premadasa (2015) in the context of the Faculty of Health-Care Sciences of Eastern University in Sri Lanka. It consists of eight processes, as shown in Figure 2.2.

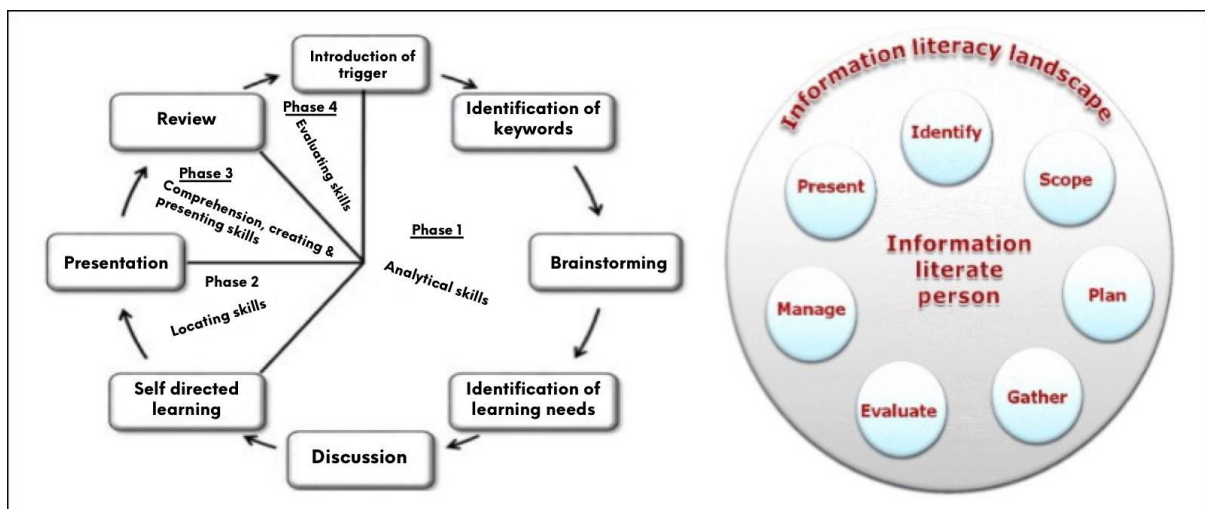


Figure 2-2 The eight steps of the PBL adopted from Santharooban & Premadasa (2015, p. 134) SCONUL Seven Pillars of IL (2011, p.4)

The two models presented above are compatible with the constructivist approach, where students are encouraged to build their knowledge based on various information activities. Both are cyclical, where the learning process is iterative. This aligns with McKinney's (2018) idea of the role of IL in inquiry-based learning (IBL) approach. However, the most basic way to distinguish between PBL and IBL is that in IBL, the learner is involved in forming the question or problem (McKinney, 2018) rather than being given a problem to solve, as in PBL. Thus, through these two models, learners can be seen as active agents and knowledge producers. The process of new knowledge construction begins by motivating previous knowledge that can be transferred and applied to new contexts.

Figures 2.2. gives more detail about the similarities between the two models. PBL adopts a student-centred approach, promotes lifelong learning and supports students in becoming critical and analytical thinkers, situated at the tenet of the IL phenomenon. Based on the above discussion and illustrative figures, IL competencies lie at the heart of the PBL process and are interwoven with each step of the PBL approach. Although there is an overlap between the Seven Pillars Model and the learning outcomes of the PBL approach, there are many PBL-related competencies which could be more fully addressed within IL education guided by the model. PBL learners make an adequate attempt to identify the opportunities and conditions of their information and to evaluate the efficacy of their efforts. Finally, IL is regarded as a core competency for self-directed learning. Thus, the need to provide medical students with sufficient IL training to be successful learners in the environment of PBL is highlighted (Santharooban & Premadasa, 2015).

2.7. Studies on IL instructional practices within the context of medical faculties

This section presents a review of relevant literature concerning IL instructional practices within the context of medical institutions and libraries all over the world. These practices include the choice of the best pedagogical approaches, IL delivery methods, IL programme content and assessment techniques. Nevius et al. (2018) distributed a survey to explore the status of IL instruction in various libraries affiliated with medical schools in Canada and the United States. It has been found that most IL instruction is being taught as a one-shot session in the first year with a particular focus on the use and search of medical databases. It also indicated that there has been a growing demand for an asynchronous teaching mode. Several studies found that the method of a flipped classroom is an effective way to deliver IL content in the context of medical education characterised as a stressful situation (Conlogue, 2019; Epstein et al., 2019; Muellenbach et al., 2018; Tagge, 2018). It employs a blended learning approach which aims to enhance students' encouragement in the class through assigning tasks to do at home before coming to the class.

The reviewed literature revealed that medical students are exposed to many opportunities through which a number of IL skills and competencies are taught. Tagge (2018) presented a case study through which medical students are provided with an opportunity in the first year to learn IL skills, critical thinking abilities and teamwork, and then these learning outcomes are assessed using a rubric. Another study was conducted at The Florida State University College of Medicine, which consulted the ACRL framework to inform their IL instructions for medical students. Their class content concerns becoming familiar with using appropriate medical

databases, keywords, APA style and utilising reference and citation management software. The learning outcomes are assessed through formative and summative assessment methods (Epstein et al., 2019). Similarly, a four-hour IL training session was developed for first-year medical students of Hacettepe University in Turkey. It was based on standards and competencies available in ACRL and the Association for Medical Education in Europe (AMEE). The course aims to help students effectively identify information, evaluate its accuracy and use information properly in ethical and legal ways. It has been found that such training positively impacts the medical students' knowledge, skills and attitudes and prepares them for future careers in the healthcare sector (Sezer, 2020).

Conlogue (2019) reflected on her IL teaching experiences and instructions for pharmacy students. She found that her traditional one-shot IL classes enhance passive learning experiences for students with low levels of IL retention to be used in their future careers in the context of evidence-based patient care. Therefore, the flipped classroom teaching mode was suggested as an effective method for teaching IL to health science students. Hence, Smith (2019) found that the integration of IL skills directly into the curricula and the alignment of these skills with EBP courses is the most effective way to teach IL to medical undergraduates. In addition, IL must be taught vertically throughout all medical school programmes and not just through one-shot library sessions in the first year. In quite a similar context, Ullah and Ameen (2019) argue that integrating IL skills into the medical curriculum as an independent and credit course at all levels requires proper planning and successful collaboration with faculty. The medical librarians at the University of Nevada Las Vegas developed their proposal for teaching IL and EBM content within the curriculum through a collaborative project including curriculum deans, directors, and faculty. They worked with other faculty members to deliver IL content via active learning sessions drawing upon a flipped classroom method (Muellenbach et al., 2018).

2.8. Summary

The reviewed literature demonstrates the importance of the development of IL models to help librarians and other IL educators design their IL teaching and learning programs as well as to encourage integrating IL as an essential learning outcome into the curriculum in different contexts and circumstances. However, the experience of the development of IL models in the Arabic and GCC contexts is not familiar despite the contextual and cultural differences that entail to be considered when developing IL models in order to meet the special learning needs of students. Also, IL is perceived and experienced differently in different disciplines. It has

been found that IL concepts are widely defined in the LIS field and educational sector, whereas it is still an obscure concept in some disciplines, such as medicine. Thus, terms like computer literacy are used alternatively. Furthermore, there is a wide recognition that IL is a critical attribute that medical students need to possess and develop in order to effectively cope with the complexity of information landscape in medicine as well as to successfully achieve their academic attainment. This study proposes to fill these gaps using a case study approach: investigating IL perceptions from three perspectives (medical academics, librarians, and undergraduate students), to develop an IL model for the FOM at KU. In order to achieve this, the SCONUL Seven Pillars model of IL (2011) is used as an analytical framework to help understand what is required of medical students to become information literate within the context of FOM at KU.

Chapter 3 Research Methodology

3.1. Introduction

For this study, a holistic single case study research with embedded units of analysis was employed using a qualitative methodology guided by a constructivist philosophical orientation. In this chapter, the research paradigm is discussed, which affects the methodological choices for this research and the appropriate philosophical positions are justified. Then, the study's research method, design and strategy are developed. Next, a detailed discussion of how the empirical data is gathered and the used data collection tools are outlined, focusing on semi-structured interviews, focus group discussion and document analysis methods. A discussion of the adopted techniques of qualitative data analysis follows this. Finally, some critical issues of research quality are assessed and addressed, and ethical issues are presented.

3.2 Research philosophy

It is recommended that the choice of philosophical position should be explicitly stated by the researcher before developing a research plan or proposal (Creswell, 2009). Adopting an appropriate research philosophy is influenced by the paradigm espoused by the researcher (Saunders, Lewis & Thornhill, 2009). A paradigm is “the basic belief system or worldview that guides the investigator, not only in choices of method but in ontologically and epistemologically fundamental ways” (Guba & Lincoln, 1994, p. 105). The paradigm is a way of thinking and is seen as a lens that guides the researcher to follow a specific methodology to address a particular inquiry (Creswell, 2009). According to Oates (2006), the choice of the appropriate paradigm hinges on a set of considerations, including the nature of research questions, the types of knowledge the researcher wants to create, the values and beliefs that shape the researchers’ perceptions towards their world and the kind of research typically conducted in specific field or discipline. Moreover, it is shaped based on ontological, epistemological and methodological assumptions the researchers adopt or believe in regarding the form of knowledge and its development.

There are a range of philosophical paradigms (e.g. positivism, post-positivism, constructivism, pragmatism). Each one proposes something different about the nature of reality (ontology) and how we gain or produce knowledge of that reality (epistemology). A constructivist paradigm is adopted for this research. Oates (2006) argues that this paradigm is concerned with understanding social phenomena in its real-life context and identifying, exploring and explaining how all other contextual factors are related and interconnected. Furthermore, constructivists seek people’s perceptions, values and meanings about specific phenomena and

how they make sense of their perceived worlds. Key points such as the choice of this philosophical paradigm (constructivism) in terms of ontological and epistemological considerations, the decisions taken in choosing the underlying philosophy concerning this research's dimensions and its relation to the research strategy (case study) for this study will be discussed in the following sub-sections.

3.2.1. Ontology

The current research espouses a constructivist ontological position (constructivism) in which social phenomena consist of multiple realities. This ontological position is considered most appropriate for social research where there are multiple actors who might have different perspectives as would be the case for my research that different actors (medical academics, students and librarians) hold different perceptions of IL phenomena within the context of FOM at KU. Therefore, this approach will enable the inquirer to deeply understand and obtain valuable insights about the phenomena under investigation achieved by multiple social actors (Creswell., 2009; Saunders et al., 2009). Understanding ontology is fundamental to any inquiry. It refers to the nature and existence of reality the researcher wants to explore (Bryman, 2008; Saunders et al., 2009). These are their ontological positions about the nature of social entities that form the social world (Hammond & Wellington, 2013). Constructivism is suitable for investigating the social world because no singular general law makes individuals see their world and things in one way. Therefore, within social and cultural issues, people look at their world differently, and thus, their views and perceptions are changeable over time (Oates, 2006). By adopting such a position, the researcher believes that IL as a reality is not objective. Still, it is constructed and interpreted by multiple individuals (the participants) who contribute to configuring and influencing the meaning of IL as a social and educational phenomenon persistently practised in specific settings such as FOM. Another thing is that IL, as a social and learning phenomenon, is understood and perceived differently according to various aspects, including contexts, culture, time, individuals, and disciplines (Bruce, 1997; Boon et al., 2007; Lloyd & Williamson, 2008). Consequently, this philosophical paradigm is consistent with this study's nature, which seeks to understand how medical educators, students and librarians conceptualise the IL phenomenon within the context of FOM at KU.

3.2.2. Epistemology

This research embraces the subjectivist epistemological position (subjectivism) in which the object of investigation (IL phenomena) and the researcher are assumed to be interactively linked (Guba & Lincoln, 1994, p. 111). Epistemology represents studying knowledge and

examining the social and physical world (Cohen et al., 2007). It is stated that constructivists are concerned with subjective realities of the social phenomenon, which is more aligned with the subjectivist epistemological position (Oates, 2006). Commitments to a particular ontological paradigm guide the inquirer to adopt certain epistemological assumptions in the field of social sciences. For example, if knowledge is seen as tangible, challenging and objective, the researcher must engage with methods in the natural sciences and align with an epistemological position known as objectivism. If knowledge is viewed as subjective, personal and unique, this encourages the researcher to engage with their subjects and adopt the epistemological stance known as subjectivism (Bryman, 2008; Cohen et al., 2007). This raises the critical question of whether social reality remains outside individuals' perceptions and actions and is built up in an objective manner (objectivism) external to social actors or is socially constructed in a subjective way (subjectivism) internal to individuals' consciousness (Bryman, 2008). For instance, if reality is seen as a series of facts waiting to be explored, the researcher will more likely utilise a quantitative approach (experimental). However, if reality is seen as existing within individuals' thoughts, feelings and claims, then constructivist (qualitative) methods are more likely to be used. Epistemologically, constructivists take a subjective approach to understanding the multiple realities' impact on the specific phenomenon. This is why the subjectivist epistemological position is assumed within this research from the beginning (Creswell., 2009).

It is argued that constructivists are not concerned with objectively ascertaining reality because they believe that truth can only be constructed by those who experience it (Guba & Lincoln, 1994; Saunders et al., 2009). Therefore, the stakeholders or actors at the social context need to subjectively understand how they perceive a given phenomenon to gain deeper insights into human interaction and behaviour (Guba & Lincoln, 1994). One of the primary objectives of this research is to explore the perceptions of medical students, educators and librarians at the FOM concerning IL phenomena and students' IL requirements. Therefore, the researcher needs to interact with the participants using qualitative tools (e.g., interviews) to deeply understand their experiences, values, attitudes and views about IL within their medical setting (FOM).

3.3. Research design

Research design is an essential factor for the success of any research project. It is defined as the “plans and the procedures for research that span the decisions from broad assumptions to detailed methods of data collection and analysis” (Creswell, 2009, p.22). The appropriate selection of qualitative (in line with the constructivist paradigm), quantitative (in line with the

positivist paradigm), or mixed methods (in line with the pragmatic paradigm) hinges on many considerations, such as research questions and objectives, the nature of research problems and the researcher's philosophical foundations and experience (Saunders et al., 2009). The following section will discuss the qualitative research methods and the rationale behind this choice.

3.3.1. Qualitative research methods

According to Merriam (1998), understanding the philosophical underpinnings underlying the research type is imperative for choosing a study design. Thus, epistemological choices influence methodological choices. Bryman (2008) describes qualitative research as a constructivist research paradigm. It is epistemologically associated with a position ontologically related to a constructivist orientation (Bryman, 2008). A qualitative approach is often used in situations in which there is little known about any given research issue; the topic of interest is not adequately covered in the body of literature; a phenomenon needing investigation has not been explored before or to understand it in its complexity (Opoku, Ahmed & Akotia, 2016). These advantages provide plausible justifications for choosing a qualitative approach as a research strategy for this study. Based on the evidence derived from the reviewed literature, IL as an educational phenomenon has not been well explored in the Arab region in general and in the Kuwait context in particular. Also, the attempt at IL model development in the setting mentioned above has yet to be made (Russel & Houlihan, 2017). Qualitative methods are required to investigate thoughts, views, attitudes and perceptions of multiple stakeholders (academics, students & librarians) that contribute to developing more understanding of IL as a complex learning phenomenon in the context of FOM at KU.

3.3.2 Guiding framework

Amongst a wide range of IL standards and frameworks, the SCONUL model was chosen as a guideline for this study for many reasons: (1) it is designed as a visual diagram including the core components of IL skill (SCONUL, 2011a), (2) the basic principles enhancing the original SCONUL model are still valid to be used in the 21st century IL requirements (Goldstein, 2015a), (3) as evidenced by the lenses that have been created namely, digital literacy lens (Inskip, 2014), open content lens (Sheppard & Nephin, 2014), research lens (SCONUL, 2011b), graduate employability lens (Goldstein, 2015b) demonstrate the SCONUL model flexibility to be easily updated, expanded and applied in different disciplinary contexts, (4) it is a well-established IL model applicable to various contexts for example, small business workplace (Lockerbie & Williams, 2019), EBP context (Dalton, 2013), HE setting (McKinney

& Sen, 2012), (5) it aids in understanding the connection between IL and the disciplinary context in which the necessary information skills of the students are developed (Golenko & Arh 2020).

3.4. Research strategy

A research strategy is a plan the inquirer adopts to address the research questions (Saunders et al., 2009). Several research approaches were considered once the researcher had identified the research problem. There are more than five strategies for qualitative research, including narrative research, phenomenology, grounded theory, ethnography, case study (Creswell, 2007) and phenomenography (Marton, 1986). Each has a different focus regarding the types of research questions asked, the selection of samples and methods of data gathering and analysis (Merriam, 2009). Therefore, the following discussion will focus on the most qualitative research approaches used in investigating IL, like grounded theory and phenomenography with providing the plausible rationale for accepting or rejecting them for this study. Finally, a case study will be discussed in detail in section 3.5.1, highlighting the reasons for its choice as a design for this research.

3.4.1. Phenomenography

More recently, new qualitative research approaches have been introduced as a novel way of revealing knowledge, understanding and meanings of the world around us (Jobin & Turale, 2019). One of these approaches is phenomenography. Ference Marton and his colleagues developed it as an effective qualitative method that enables scholars to investigate peoples' experiences and perceptions towards a given phenomenon. Marton (1986, p.31) defines phenomenography as “a research method for mapping the qualitatively different ways in which people experience, conceptualise, perceive and understand various aspects of, and phenomena in, the world around them”.

Phenomenography was initially developed to be used in teaching and learning areas (Marton, 1992), but after that, it has been widely employed in other disciplines, including LIS, with a particular interest in IL research (e.g. Bruce, 1997; Diehm & Lupton, 2012; Boon et al., 2007; Maybee, 2006 in HE sector as well as Forster, 2015a in the health sector). The main aim of the phenomenographic approach is to identify variations in understanding a specific phenomenon (Marton, 1986). The first use of this approach to IL research studies by Bruce (1997) has challenged “the consensus approach that characterises the formulation of information literacy definitions, models and standards in the LIS sector” (Boon et al., 2007, p. 209) that considers IL as normative conceptions based only on experts' perspectives and experiences like librarians

(Sample, 2020). This approach has significantly contributed to gaining a more profound understanding of IL as a phenomenon with several meanings based on the context in which it is apprehended, perceived and experienced. Applying this type has crucial implications for improving IL learning intervention programmes and supporting the development of IL models and frameworks (Forster, 2016).

Phenomenography was not used since this study aimed to investigate IL practice and perceptions in a specific context. A phenomenographic study focuses on the participants' conceptions or experience of a phenomenon. Descriptions of phenomenographic methods (e.g. Marton, 1992; Bruce, 1997) all identify that the focus is on gaining insight on how the participant perceives the phenomenon, normally through interviews. The researcher does not gather evidence about the exact context of the participants, nor relate the perceptions to the evidence about this exact context. In this research, the researcher aimed to develop a model of IL specifically for the Faculty of Medicine at Kuwait University, obtaining evidence about policy and practice in the University and Faculty. Therefore, phenomenography was not the best approach to use.

3.4.2. phenomenology

Phenomenology is different from the phenomenographic approach. Whereas phenomenography focuses on people's experience or conception of a specific phenomenon (Marton, 1986), phenomenology is interested in exploring the essence of the phenomenon itself. It is defined as a method that “is interested in elucidating both that which appears and the manner in which it appears. It studies the subjects’ perspectives of their world; attempts to describe in detail the content and structure of the subjects’ consciousness, to grasp the qualitative diversity of their experiences and to explicate their essential meaning” (Willig, 2013, p. 85). It is concerned with the world as it presents itself to us as humans. Its aim was to return to things themselves, as they appear to us as perceivers, and to set aside, or bracket, that which we (think) we already know about them. Phenomenology is concerned with the phenomena that appear in our consciousness as we engage with the world around us (Willig, 2013, p. 83-84). Participants in phenomenographical research studies need to reflect on what the experience means to them rather than merely describe their experience (Barnard et al., 1999). This can be explained by the argument provided in Boon et al.’s (2007) study that aims to investigate English academics’ concepts of IL in UK universities. They argue that it is not necessary to look for teaching concepts that lead to a description of teaching itself but probably

result in describing various ways academic tutors understand, perceive and experience teaching.

3.4.3. Grounded theory

Grounded theory is considered a type of qualitative research where the inquirer is the primary instrument of the data collection and analysis process and adopts an inductive position (Creswell, 2007). It is a strategy for conducting research and concentrates on a process associated with a particular topic to develop a theory that emerges from the gathered data. Although its origin dates back to sociology, the prevalence of grounded theory studies can now be seen in almost all disciplines and fields of practice (Creswell, 2007). It has been used a lot in IL and information behaviour research (see, e.g. Herring, 2011; Hicks, 2018; Martin, 2013; Maybee et al., 2015) and thus has the potential to provide a model of IL in a medical learning context which is the ultimate goal of this research. Although grounded theory aims more to identify commonalities and to develop a model that could potentially be of more general application, this study under investigation seeks to surface and capture more granularity of the differences and similarities in the perspectives of different stakeholders (academics, students and librarians) which are fundamental elements of this research. Therefore, there are better choices than a grounded theory approach for this study.

3.4.4. Ethnography

It is the most familiar to qualitative researchers among other various types of research. This approach originated in anthropology, but now, researchers from many disciplines might engage with and use ethnographic studies. The main focus of ethnographic studies is to in-depth describe the culture of a given social group (Merriam, 2009). This thick description of cultural norms, beliefs, values and social structure of human society can only derive from the immersion of ethnographic researchers in the natural setting for an extended period. It is argued that it is insufficient to depict the cultural practices; ethnographic researchers should go beyond that to understand and interpret the cultural meaning of the phenomena (Creswell, 2007). Since an ethnography would involve the researcher embedding within the cultures, observations and memoing of observations are at the core of this. Hence, there would only be time for doing this with some of the stakeholder groups mentioned above, and there might be practical issues in doing it with some of the stakeholder groups (each of which has its own culture). Therefore, this approach is not suited for addressing the research questions of this study.

In the following sections, a case study is defined and discussed in more detail, particularly from a qualitative perspective, with reasonable justifications for choosing a case study as the appropriate approach to this research.

3.4.5. Case study research

A case study is considered one of the most common research strategies used as a methodological technique (Yazan, 2015). However, a case study's position in social science as a research strategy is still not legitimate since it is perceived to lack well-defined and structured protocols (Yin, 2009). Therefore, novice researchers planning to use it frequently feel confused about what it is and how it can differ from other qualitative approaches (Merriam, 1998). Although there is an extensive discussion in the literature regarding the case study approach (e.g. Creswell, 2007; Saunders et al., 2009; Oates, 2006), there is still disagreement amongst research methodologists about the implementation and application of case study (Yazan, 2015). This motivated Yazan (2015) to undertake a study that aims to provide a spectrum of different perspectives of case studies widely utilised in educational research proposed by three prominent research methodologists: Yin, Merriam, Stake, as shown in Table 3.1. Yazan argues that each has its own ontological and epistemological orientations, which affect the procedures they suggest when conducting case study research. These three perspectives are examined and compared in several dimensions, as shown in Table 3.1. They do not always diverge but sometimes converge and complement each other. This synthesis and analysis of three guides allow the researchers to choose the most appropriate and functional approach once they decide to conduct their case study research (Yazan, 2015).

In the following table 3.1., the researcher presents how the three methodologists discuss several dimensions of the case study approach. These include epistemological commitments (constructivism); case study definition (an intensive and holistic description and analysis of IL phenomenon in a bounded setting (FOM)); research design (qualitative single case study with embedded units of analysis, conducting literature review, identifying research problem, formulating research questions, selecting purposive samples); data collection methods (semi-structure interviews, focus group discuss, analysing documents); data analysis (using thematic analysis to make sense out of the data deploying the techniques of within and cross-units analysis); data validity (many strategies employed to ensure (1) credibility (e.g. triangulation, member check) (2) dependability (e.g. peer examination, audit trail) (3) transferability (e.g. thick description)). The choice of these categories enabled the researcher to inform the whole design of this study and help show and investigate IL phenomena more in-depth.

Dimension of interest	Yin (2003)	Stake (1995)	Merriam (2009)
Epistemological Commitments	Positivism	Constructivism and existentialism	Constructivism
Case Study Definition	Case study is an empirical inquiry that investigates the case or cases conforming to the abovementioned definition by addressing the “how” or “why” questions concerning the phenomenon of interest.	Qualitative case study is a study of the particularity and complexity of a single case, coming to understand its activity within important circumstances	Qualitative case study is an intensive, holistic description and analysis of a bounded phenomenon such as a program, an institution, a person, a process, or a social unit
Case Study Design	Four types of case study design include single holistic design, single embedded design, multiple holistic design, and multiple embedded design. Case study design has five components: a study’s questions; its propositions, if any; its unit(s) of analysis; the logic linking the data to the propositions; and the criteria for interpreting the findings.	Flexible design which allows researchers to make major changes even after they proceed from design to research. Researchers need a set of two or three sharpened issue questions (research questions) that will “help structure the observation, interviews, and document review.	Literature review is an essential phase contributing to theory development and research design. Theoretical framework emerging from literature review helps mold research questions and points of emphasis. Five steps of research design: conducting literature review, constructing a theoretical framework, identifying a research problem, crafting and sharpening research questions, and selecting the sample (purposive sampling).
Data Collections Methods	Quantitative and qualitative evidentiary sources should be combined. Case study researchers make use of six data gathering tools: documentation, archival records, interviews, direct observations, participant observation and physical artefacts.	Exclusive use of qualitative data sources. Qualitative case study researchers exploit observation, interview and document review as data gathering tools.	Exclusive use of qualitative data sources. Qualitative case study researchers utilize three data collection techniques conducting interviews, observing, and analysing documents.
Data Analysis	It consists of examining, categorizing, tabulating, testing, or otherwise recombining both quantitative and qualitative evidence to address the initial propositions of a study. Five dominant techniques for data analysis: pattern matching, explanation building, time-series analysis, program logic models, and cross-case synthesis.	It is a matter of giving meaning to first impressions as well as to final compilations. Two strategic ways to analyse data: Categorical Aggregation and Direct Interpretation.	It is the process of making sense out of the data... [which] involves consolidating, reducing, and interpreting what people have said and what the researcher has seen and read – it is the process of making meaning. Six analytic strategies: ethnographic analysis, narrative analysis, phenomenological analysis, constant comparative method, content analysis, and analytic induction.
Data Validity	Case study researchers need to guarantee construct validity (through the triangulation of multiple sources of evidence, chains of evidence, and member checking), internal validity (through the use of established analytic techniques such as pattern matching), external validity (through analytic generalization), and reliability (through case study protocols and databases).	Issues of data validation are involved in the notion of triangulation. Four strategies for triangulation: data source triangulation, investigator triangulation, theory triangulation, and methodological triangulation.	Qualitative methodology approaches differently to validity and reliability of the knowledge produced in research. Six strategies to enhance internal validity: triangulation, member checks, long-term observation, peer examination, participatory research, and disclosure of researcher bias. Three techniques to ensure reliability: explanation of investigator’s position with regards to the study, triangulation, and use of an audit trail. Three techniques to enhance external validity: use of thick description, typicality or modal categories, and multi-site designs.

Table 3-1: Juxtaposition of three case study approaches adapted from Yazan (2015, p. 148)

As stated above, epistemological choices affect methodological options that permeate each research process step, from research question formulation to report composition. Despite the subjectivist epistemological inclinations of this research, which is closely aligned with Stake and Merriam's philosophical orientations, the researcher will also capitalise on sets of instrumental tools, guidelines and strategies suggested by Yin, who has an opposite position, as shown in Table 3.1. as in the highlighted points of some dimensions. For example, Yin's approach to designing a case study is helpful in terms of defining units of analysis because none of the others explains units of research in this much detail. Thus, this will be helpful for its practical implementation in this study. Therefore, these units are useful and relevant to this study, enabling the researcher to analyse the data separately and across all subunits. In contrast, Merriam's constructivist definition of a qualitative case study will be used as an overall definition of this study to form a framework that guides this research. This would be impossible with Yin's philosophical orientation related to the case study because it is focused on more positivist propositions. According to Yazan (2015), Merriam defines the case in a more comprehensive way than other methodologists, which can include many things: a person, a program, a group, a specific policy and so on and thus, she defines the case as "a thing, a single entity, a unit around which there are boundaries" (Merriam, 1998, p.27). Her understanding of the case reflects on her definition of case study, which "provides flexibility in utilising qualitative case study strategy to research a much wider array of cases" (p.139), best fitting this study's nature. This detailed description allows the researcher to easily define the IL phenomenon as a case occurring within a bounded setting (The FOM), consistent with Merriam's notion of the case and case study. However, although the position of this research is constructivist, all these methodological approaches will be applied to achieve this qualitative case study research successfully.

The decision to focus on qualitative case studies stems from the fact that this design is chosen precisely because the researchers are interested in insight, discovery, and interpretation rather than hypothesis testing (Merriam, 2009). Therefore, the qualitative case study research is particularly suitable as the research design for this study because it enables the researcher to uncover how the IL phenomenon (case) is experienced, understood and perceived from multiple sources of evidence: medical educators, students, librarians and documentations within its bounded context (The FOM at KU).

Merriam (1998) argued that a case study approach binds the researcher to limited data collection and analysis methods. Still, it allows various data-gathering methods such as

interviewing, observing or document analysis. This enables the research questions to be answered from different perspectives and further explore the complexity of phenomena by collecting a large set of evidence from various sources called “data triangulation” (Stake, 1995). Therefore, the researcher would be able to explore the IL phenomenon within a specific context of the selected faculty at KU by using different data sources so that multiple dimensions of the IL phenomenon or reality can be further investigated.

A case study concentrates on holistic description explanation (Merriam, 1998). As Yin (2009) notes, a case study is a suitable design for situations where phenomena' variables are impossible to separate from their contexts. This is why this design is particularly suited to identify the factors which have the most significant impact on the provision of ILE and constitute potential barriers to the development of IL as a whole in the FOM. According to Yin (2003), a case study is a particularly suitable method for exploring contemporary phenomena in their real-life context. Hence, this research has adopted it to gain a holistic understanding of the current state of IL and instructional practices espoused by the FOM in the real-life setting of KU.

3.4.5.1. Types of case study design

This study adopts a qualitative single case study with embedded units of analysis as a research methodology. This section will explain the options and reasons behind making this choice.

After determining a qualitative case study design as the best strategy to answer the research questions, the researcher must choose the kind of case study (Baxter et al., 2010). Several writers categorise a case study design according to its types or functions (Merriam, 2009). It can be categorised based on its purpose: explanatory, exploratory, descriptive, or typology (Yin, 2009). The selection of the appropriate design offers the researcher the full utilisation of addressing the research questions, considering its strengths and weaknesses, and avoiding any pitfalls that could occur during the process of implementation (Yin, 2009). The study's overall purpose is to guide the selection of the best kinds (Baxter et al., 2010). The following sections will discuss the most suitable one for this study.

According to Yin (2009), an explanatory approach can be used if the researcher needs to explain the causal relationships between real-life interventions, while a descriptive case study describes a case or phenomenon in its real-life context in detail. An exploratory case study could be helpful when the researcher needs more relevant literature about the topic. Due to the limited research and knowledge in IL within the Kuwait and Arabic region, this study is classified as an exploratory case study (Yin, 2009). This case-study design will enable the

researcher to gain an in-depth understanding of IL phenomena and to investigate its instructional practices within FOM at KU.

In terms of typology of types, Yin (2009) categorises a case study into four types: single holistic, multiple holistic, single embedded and multiple embedded. Holistic designs need at least one unit of analysis, whereas embedded designs need many branches of analysis. A single case study is often used if the researchers intend to represent a critical or unique case, and it may be chosen to enable the inquirers to deeply analyse or observe a phenomenon that has had little consideration previously (Yin, 2009, 2003). It can also significantly contribute to knowledge and theory construction by confirming, challenging and extending the theory (Yin, 2009). Conversely, multiple or collective case studies have more than one single case (Baxter et al., 2010) and involve gathering and interpreting data from various cases and can be distinguished from the single case study in that it may have subunits or subcases embedded within (Merriam, 2009; Yin, 2009). The conduct of such a study can require extensive resources and time beyond the capacity of a single student or independent investigator; thus, the decision to do multiple case study research should be taken carefully (Yin, 2009). Based on Yin's (2003) typology, this study is classified as a single case study because it focuses on only one single case (IL phenomenon) within a bounded context (FOM at KU).

The same single-case study also involves two distinct types: a single holistic case study or a single case study within embedded multiple units of analysis (Yin, 2009). Baxter et al. (2010) argue that the difference between a single case study with embedded units of analysis and a single holistic case study is the context. For instance, within the former, the researcher can analyse each team and across them. At the same time, they can understand only one unique or extreme setting through the latter. Yin (2009) states that using such a holistic approach would make an investigator avoid any specific phenomenon in operational detail. Thus, typical problems such as conducting the case at an unduly abstract level and needing more sufficiently clear data could happen when doing the entire case study.

For this study, however, a single case study within embedded multiple units of analysis is more powerful. It allows the inquirer to profoundly investigate the situation while considering the impact of the characteristics of various studying phases (different phases of medical undergraduate students, as shown in Figure 3.1) and associated attributes on medical students' IL experiences. Furthermore, it can also add significant opportunities for extensive analysis, promoting insights into the single case while considering the concern of returning to the

original point considered as a pitfall that Yin (2009) highlights when choosing such a design. This design allows to capture more granularity of the differences and similarities in the perspectives of different stakeholders. By this, the researcher can define each group's IL requirements within the same bounded setting. Therefore, this research falls into the category of a single case study with embedded units of analysis because it focuses on a single case (IL phenomenon) within the context of FOM at KU, which investigates the three different studying phases of medical undergraduate students as embedded units of analysis as shown in figure 3.1.

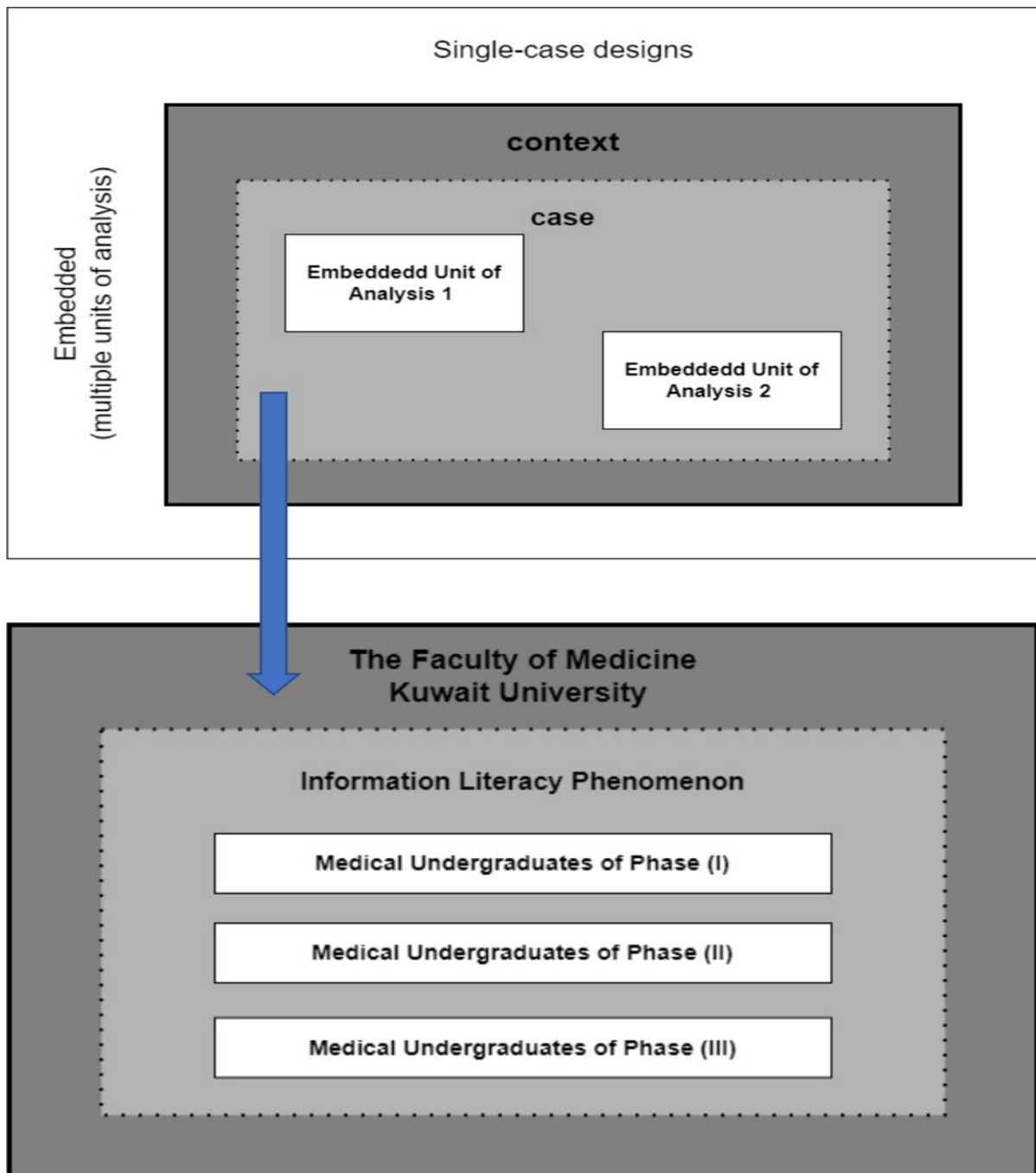


Figure 3-1 The single case study design with embedded multiple units of analysis used in this study (adapted from Yin, 2009, p.50)

3.5. The case study

The case study approach is suitable for investigating IL as a real-world phenomenon in the FOM at KU as a bounded setting. KU was chosen as a site for this case study because it is a public research, the leading university in Kuwait and the researcher is a Kuwaiti resident. Therefore, the researcher considering Kuwaiti has access to the case to undertake his research.

The FOM is the only medical institution at KU and offers a seven-year medical programme. Since 2005, it has adopted a system based on EBM and PBL and an integrated curriculum that encourages students to be exposed to clinical experience from early stages. The new system is divided into three phases based on the principles of a student-centred teaching approach to motivate students to be more independent learners. This can be achieved by adopting various teaching approaches, including Evidence-based learning (EPL), small group teaching, PBL and clinical skills learning sessions (Kuwait University, 2019), where IL competencies are fundamental to the success of such approaches.

Phase one (I) comprises the programme's first year, encompassing introductory modules. Phase two (II) is distributed across six semesters (years 2,3,4) of the curriculum where, in the end, undergraduate students are awarded a degree in Bachelor of Medical Sciences (B.Med.SC), which enables them to proceed to the third phase. Phase three (III), a clinical programme, consists of the last three years of the programme (years 5,6,7). Finally, the undergraduates are given degrees in Bachelor of Medical Sciences and Bachelor of Surgery (B.M.B.Ch.) (Kuwait University, 2019).

3.6. Choice of units of analysis

Units of analysis can be individuals, departments, or small groups in a single case study (Yin, 2017). For this study, medical undergraduate students are selected as units of analysis based on the faculty's way of phasing them, as shown in Table 3.2. According to Miles and Huberman (1994), a case is defined as "a phenomenon of some sort occurring in a bounded context. The case is, in effect, your unit of analysis" (p.25). However, determining the unit of analysis in the case study approach is complex for the researcher (Yin, 2003). Therefore, identifying units of analysis within a single case study is an essential step, where the researcher can either analyse the data within the subunits separately or across all subunits (Baxter et al., 2010). Individuals can be the primary data collection method in the investigated case (Yin, 2009). As this study aims to support the development of IL for Kuwaiti medical students, the decision is being made to choose different studying phases of medical undergraduate students as the primary units of analysis. These units would be the most appropriate segments to understand IL phenomena in-

depth within the FOM and how medical students may conceptualise IL differently in each unit (phase). Another logical selection of these phases as units of analysis is that they would help the researcher see the effects of each phase's different backgrounds and experiences on students' response to any IL development (SCONUL, 2011). Moreover, actors are mainly selected since they are more likely to contribute to theory construction (Eisenhardt, 1989) and therefore, individuals medical students were chosen in order to achieve the ultimate goal of this research that aims to build an IL model. Table (3.2.) illustrates the characteristics of each unit of analysis selected for this case study.

Unit of analysis	Phase duration	Characteristics of phase I, II & III medical students
Phase (I)	The first Year	<ul style="list-style-type: none"> • Introductory Units • Doing basic assignments
Phase (II)	Year (2,3,4)	<ul style="list-style-type: none"> • Obtaining B.Med.SC • Preclinical stage • Having PBL sessions
Phase (III):	Year (5,6,7)	<ul style="list-style-type: none"> • Obtaining B.M.B.Ch. • Clinical stage • Having PBL sessions • Conducting high-quality group research work • Participating in a collective presentation • The curriculum aims to be more autonomous

Table 3-2 Units of analysis: phase I, II & III medical students

3.7. Study population

This study's target population involves three significant stakeholders: medical educators, undergraduate students and librarians in the FOM. The recruitment of medical academics is a critical component of the study of populations due to their leadership role in designing the IL curriculum and making policy decisions. In terms of IL literature, it was found that much about IL instructions and practices in higher education is predominantly written for librarians,

focused on librarian-led initiatives and described from a librarian perspective while neglecting other critical voices such as faculty (Bury, 2016). They, however, tend to have a vital role in designing and assessing coursework and assignments, significant influence on the IL agenda in higher education and a higher tendency of undergraduates to consult educators than librarians (Bury, 2016).

In terms of medical undergraduate students, investigating IL practices and provision from learners' lenses is valuable because they have been directly experiencing and gaining IL education from their educators and librarians. Since this study aims to support the development of IL practices in Kuwaiti medical students, the understanding of learners' insider perspectives is a crucial player in learning (Todeva & Cenoz, 2009) and knowing students' opinions and views contributes to IL program development to provide them with a more comprehensive education (Yevelson-Shorsher & Bronstein, 2018). Therefore, they serve as a unit of analysis to understand the perception of the IL phenomena during their various studying phases. They are considered one of the best samples to provide invaluable evidence to understand their information needs according to their different studying phases. Additional rationale for including students as one of the significant populations of this study is derived from IL literature. The recent ACRL framework states that students have a more substantial role and responsibility in creating new knowledge, understanding the contours and changing dynamics of the world of information, and ethically using information, data, and scholarship (ACRL, 2016). Thus, IL practices in the context of the FOM must be examined and studied from students' perspectives to have a holistic understanding of the phenomenon under investigation.

Based on review documents, the Training and Information Literacy Department (TILD) forms a part of 20 HSCL departments at KU, serving five faculties, of which the FOM is one (Kuwait University, 2019). TILD is responsible for promoting IL concepts and skills among staff, students and healthcare professionals of the medical faculty. Due to the high relevance of TILD for this study, librarians are regarded as a primary source of evidence and play a significant role in IL education. Consequently, views obtained from academic librarians are considered significant evidence sources. Based on the reviewed literature, librarians are more responsible for identifying core ideas within their knowledge domain that can extend student learning, create a new cohesive curriculum for information literacy, and collaborate more extensively with faculty (ACRL, 2016). Therefore, knowing these participants' positions on the studied phenomenon also provides further insight into the current state of IL education.

3.8. Sampling and recruitment of the participants

A sample is a subset of the targeted population selected to represent the population's views, experiences or thoughts. Sampling is "selecting a few from the many to conduct empirical research" (Pickard et al., 2013, p.59). To achieve the aims of this study, purposive sampling techniques are used. This method is exploited when deep insights are required. The researcher thus purposively selects individuals, settings or groups to maximise comprehension of the phenomena (Onwuegbuzie & Leech, 2007). Purposive sampling is the most common approach used in qualitative research (Saunders et al., 2009). However, determining sample size in advance is problematic and daunting for qualitative researchers (Malterud, Siersma & Guassora, 2016; Sim et al., 2018). Hence, several issues, such as the scope of the study and the degree of homogeneity among participants, should be considered to justify sample size determination (Boddy, 2016). Data saturation is another technique that can be used in the context of qualitative research sampling. It is employed when sampling continues until no new results or data are produced (Bryman, 2008). This study collects data from three primary stakeholders: medical educators, librarians and undergraduate students. Therefore, multiple purposive sampling strategies are utilised to determine the sample size. The proposed sample sizes and data collection methods are discussed in the following sections.

3.8.1. Medical academics

Because the units of analysis are concerned with different student phases instead of the departments, lecturers did not have to be from all the faculty departments, which is out of the scope and timeframe of this study. However, 18 academic staff from various departments who teach medical students within all three phases (the units of analysis) were recruited to gain their thoughts and opinions about IL skills and knowledge that medical students need and possess in each phase for their academic success. This diversity added value to the research because it enabled the researcher to explore the IL phenomenon from multiple perspectives, facilitating the discovery of IL requirements and constructing an inclusive picture of medical students' information needs, behaviour and skills at the three levels. The recruitment of 18 academics was conducted voluntarily, and with this number of participants, it was expected that the saturation level, to a large extent, was reached.

3.8.2. Medical undergraduate students

Based on the units of analysis, a subset of 31 undergraduate students were selected purposively from three studying phases to obtain a deep understanding of the IL phenomena. This target segment of the population was divided into units (homogeneous sub-groups) based on the phases of their studying duration. According to Onwuegbuzie and Leech (2007), this sampling

scheme, known as stratified purposive sampling, assisted the researcher in establishing group comparisons. Therefore, this strategy was selected by the researcher based on the aims and objectives of the study. Table 3.3. illustrates how a stratified purposive sampling strategy was implemented with different segments of medical undergraduates.

Units of analysis	Phase (I)	Phase (II)			Phase (III)		
Studying duration	1 st year	2 nd year	3 rd year	4 th year	5 th year	6 th year	7 th year
Number of participants	7	4	4	4	4	4	4
Total	7	12			12		
	31						

Table 3-3 Medical undergraduate students sample size

3.8.3. Medical librarians

Academic librarians from the Health Science Centre Library Administration (HSCL) were chosen as the target sample since it is the primary source of health information for the FOM. Based on other empirical studies, it is stated that the focus group's sample size should be small to allow everyone to share their voice equally, and therefore, it should range from 6-12 persons (Onwuegbuzie & Leech, 2007). Hence, it was decided to employ a homogeneous sampling strategy to recruit six librarians.

The total number of participants in this study is 55. This number aligns with the most similar PhD qualitative case study, i.e. Dokphrom (2010), which is a study of IL, recruited 68 respondents in Thailand, while Al-motawah (2016) employed 48 participants in Kuwait. In addition, they both conducted a PhD in the Information School Program at The University of Sheffield.

3.9. Data collection methods

In the case study approach, data can be gathered from a variety of methods: interviews, focus group discussion, identifying documents, and participant observation (Yin, 2009; Merriam, 2009). One of the advantages of using a case study as a methodological approach is that it allows the researcher to study the topic of interest from multiple angles, utilising the triangulation technique (Merriam, 2009; Stake, 1995). This type of triangulation is called “data triangulation”, which assists the researcher in collecting data from multiple sources of evidence

(Patton, 2002). This, in turn, enables various measures of the same phenomenon to be provided and thus helps to strengthen the “construct validity” of the case study approach (Yin, 2009, p. 121). In the present study, data collection methods: semi-structured interviews, focus group discussion and identifying documents are used to elicit the empirical data from a range of participants.

3.9.1. Semi-structured interviews

Interviews can be divided into three main categories: structured, semi-structured and unstructured (Oates, 2006). For this research, semi-structured interviews were used as the significant data-collection strategy. It allows interviewees to express their thoughts and feelings and is thus used when the primary purpose is discovery instead of checking (Oates, 2006). It is featured as less structured and more open-ended, enabling the respondent to define their world uniquely (Merriam, 2009). Semi-structured interviews are the most commonly employed in collecting qualitative data in case studies (Merriam, 2009). It is also widely used when specific themes require interviewer exploration during the interview (Saunders et al., 2009). It is often guided by open-ended questions, known as the “interview guide” or protocol, considered a map for the researcher, steering the dialogue towards fundamental themes and topics of the research (Saunders et al., 2009).

A semi-structured interview is advantageous when the researcher is willing to change the order of the protocol guide sequence based on the flow of conversation and to add additional questions to the body of the protocol according to new issues that might be raised by the interviewees (Oates, 2006). Using this method, the inquirer can also examine the participants’ responses, which can help the researcher explore new themes relating to the IL phenomena that may emerge from the interview (Saunders et al., 2009). Semi-structured interview methods were conducted to gather data from the academics and undergraduate students because, as mentioned above, this method enables the researcher to investigate the interviewees’ responses profoundly and to explore the IL phenomena from different perspectives and in different situations.

3.9.2. Focus group

Focus groups are helpful for the exploration of experiences and perceptions among a group who share similar views (Bryman, 2008; Onwuegbuzie & Leech, 2007). Given the common interest shared by this professional group of librarians, the researcher decided to undertake a focus group discussion with six librarians from HSCLA who share similar characteristics, attributes and attitudes towards IL education. During the group discussion process, the

researcher serves as a facilitator (Saunders et al., 2009) to stimulate and encourage the discussion across all group members to observe their IL interactions (Bryman, 2008). Oates (2006) identifies several advantages and disadvantages of focus groups. The advantages include generating consensus views, generating more responses when one participant challenges or stimulates others to new ideas, while disadvantages are that some members might dominate the discussion and some individuals could be reluctant to express their views in front of others explicitly.

The focus group was considered an appropriate method since it enabled librarians to share and exchange their views. Unlike academics with different timetables and students studying online, librarians' exact schedule and agenda enabled the researcher to quickly and smoothly group interviews consisting of 6 individuals at the same time and place. It was also an essential element to help improve the triangulation and allowed the researcher to explain why some librarians hold a particular opinion of a given issue.

3.9.3. Documents

Using documentary material to gather data would be similar to other tools like interviews and observations. There are three kinds of documents: public records, personal papers and physical materials that can be used by the researcher for analysis (Merriam, 1998). Document review is regarded as a supplementary method in the case study to enhance data triangulation (Stake, 1995) as well as to "corroborate and augment evidence from other sources" (Yin, 2003, p.87). Merriam (2009, p. 39-40) states that the importance of documents is not just for giving information about the program itself but also for stimulating reasoning about significant questions to follow through more direct interviewing. The best documents are those recorded by a qualified individual at a suitable time and within the context of the phenomena. The researcher was responsible for verifying the authenticity and accuracy of documents as part of the research process in terms of their origins, creators, the contexts in which it is written and the reasons for which it is written. For the present study, several data collection methods are used to elicit the empirical data from a range of participants, as shown in table 3.4.

Data sources	Data collection methods
Medical academics	Semi-structured interviews
Medical undergraduate students	Semi-structured interviews
Medical librarians	Focus group discussion
documents	Identifying documents

Table 3-4 Data sources and methods of the case

3.10. Protocol development

Before conducting interviews, an interview protocol needs to be developed to steer the dialogue towards the desired direction (Kvale, 2011). Jordan et al. (2021) emphasise the importance of rigorousness when conducting interviews to ensure the trustworthiness of findings. To overcome such challenges, the researcher was congruent with the idea of adopting the Interview Protocol Refinement (IPR) framework proposed by Castillo-Montoya (2016) and other critical recommendations suggested by Jordan et al. (2021) to enhance the reliability and validity of the interview protocol. IPR consists of four main steps: (1) ensuring interview questions align with research questions, (2) constructing an inquiry-based conversation, (3) receiving feedback on interview protocols and (4) piloting interview protocol (Castillo-Montoya, 2016). It also involves pilot testing procedures as a final refinement step, which assists the researcher in gauging and ensuring the refined interview instrument before actual fieldwork. The researcher needed to follow its steps more rigorously in the study under investigation.

Initially, the researcher developed the protocol in English which was then translated into Arabic to suit the study population (see Appendix 1, p. 308). Morgan and Krueger (1998) argue that asking respondents to speak in a language other than their first language can lead to discomfort and inconvenience and thus severely limit discussion as they may need more words that best express their views. Therefore, a better strategy is to conduct interviews and focus groups in the participants' first language with a moderator or interviewer fluent in both that language and English.

To ensure instrument content validity, Jordan et al. (2021) highlight the necessity of reviewing the literature while constructing the protocol to seek input from experts in the field or to build consensus. Thus, the researcher depended on previous empirical studies on the topic of interest (i.e. Dokphrom, 2010; Salha, 2011) with significant modifications to fit the nature of the medical academic community and the contextual differences. This process helped the

researcher develop a more reliable and valid interview protocol by utilising all previous experiences and knowledge in IL (Kallio, Hanna et al., 2016).

3.10.1. Aligning interview questions with research questions (IPR Step 1)

This study gathered data from three different segments (lecturers, students and librarians). Hence, the interview questions were slightly different (see Appendix 2, p. 314), but all revolved around the following fundamental research questions:

RQ1: How do medical academics, students, and librarians of the FOM conceptualise IL within the context of KU?

RQ2: What is the existing state of ILE within the context of the FOM?

RQ3: What is required of medical students to become information literate?

In this stage, an interview protocol matrix was developed (see Appendix 2, p. 314) to map the interview questions into it. The purpose of mapping the interview protocol matrix is to ensure that the interview protocol covers all research questions. By doing so, the researcher could examine the constructed questions and then identify any gaps that may be present. Thus, the researcher can fill the gap by adding relevant questions to the protocol based on research questions and objectives (Castillo-Montoya, 2016).

The interview design begins with the opening questions, which elicit background information as demographic and personal data (e.g. for students: names, studying phase and year, academic achievement). According to Morgan and Krueger (1998), these questions are designed to be answered quickly and make participants feel comfortable by identifying their common characteristics. The interview is followed by an introductory question, which allows open-ended and probing questions on IL conceptions to be asked. This type of question has been constructed to facilitate conversational interaction (Yeong et al., 2018) and to provide respondents with an opportunity to reflect on their experiences and connection with the overall topic (Morgan & Krueger, 1998).

The interviewer seeks to explore and identify possible contributing factors and difficulties that constitute barriers to IL development within the context of FOM at KU. These questions were only limited to the participants of medical academics and librarians due to their IL teaching experiences and leadership role in designing the IL curriculum.

The interview protocol was designed to include an open-ended final or ending question at the end of each interview question, which allows the participants to express any additional thoughts

freely. This question was constructed to capture any new insights that may arise during the interview dialogue. These questions aim to ensure that critical aspects have been addressed (Morgan & Krueger, 1998).

Research question number (2) related to the existing state of ILE within the context of the FOM cannot be elicited directly from interview questions. However, document review can considerably contribute to answering this research question and previously constructed interview questions.

3.10.2. Constructing an inquiry-based conversation (IPR Step 2)

The primary purpose of this stage is to refine the proposed questions to be ordinary conversation discourse rather than academic language. Based on the IPR framework, the interview questions should be formulated differently from the research questions. The research questions are written according to the inquirer's understanding of a particular phenomenon. In contrast, interview questions are worded to obtain the comprehension of the participant's perceptions of the topic under investigation. The organisation of the interview questions is also based on social norms of daily conversation. Various follow-up and probing questions are also prepared to fit different discourse styles (Castillo-Montoya, 2016).

This protocol begins with introductory questions which every participant can quickly answer. This also plays a vital role in building a good rapport between the interviewer and the interviewee and relieving participants' anxiety. Concerning question language, the interview questions allocated to elicit information on research question number (3) are academically formulated to a large extent. This refers to the fact that these questions are geared towards professionals such as librarians and academics with practical experience in the IL field. This phase was further developed and refined after receiving critical feedback from the experts in step (3) and a pilot study of actual participants in step (4).

As mentioned above, the IPR approach characterises its flexibility. This enables the researcher to develop an introductory document (see Appendix 3, p. 316) and then incorporate it during this stage as an assistant tool to increase the flow of conversation. This document was devised with the aim of avoiding any ambiguity that can result from the unfamiliarity of IL terms. The document contains two main definitions of SCOUNL 2011 and CILIP 2018, as well as the seven pillars of the IL diagram used during the interview as a means of helping participants reflect on and explore their concepts of IL. The SCOUNL model was given to the participants before the interview so they could study it deeply and reflect on their IL experiences. During

the interview, the participants were asked several questions about the SCONUL model (e.g. what do you think of SCONUL model?, what IL skills do medical students need now and in the future that are not represented in this model?, what kind of skills do you think important to your students? based on the SCONUL model, what are the most significant aspects of IL do you think medical students' needs?). Therefore, the model was kept in front of the participants during all the period of the interview to ensure their deeper engagement with the model as well as to fully reflect on their IL experiences and practices.

The interview protocol was designed to investigate IL conceptions of the respondents and how their experiences might be associated with their background. Therefore, to overcome the unfamiliarity dilemma of the IL concept, the researcher also followed the “Think Back Strategy” suggested by (Morgan & Krueger, 1998). This strategy aims to ask participants to think back on questions to reflect on their personal experiences and then respond to a specific question (p. 32). The researcher also adopted other effective strategies to evoke participants' memories and vivid experiences about IL concepts by giving them an example from their academic environment or providing background information on IL to participants to avoid or minimise “tacit assumptions” (p. 38). Tacit assumptions, unlike explicit assumptions, refer to underlying beliefs and attitudes held by people implicitly often without conscious awareness. In addition, the interview and focus group instruments were designed to allow the capturing of new data specific to this study not covered in the literature, e.g. IL requirements of medical students and the problems and factors affecting the development of IL in the FOM at KU.

3.10.3. Receiving feedback on interview protocols (IPR Step 3)

Jordan et al. (2021, p.2) assert that “asking an experienced qualitative researcher to review the questionnaire before interviews can also help to identify and address potentially biased questions”. In this stage, the researcher consulted two experts (academic supervisors) in the field of IL and qualitative research to receive input on the feasibility of the interview protocol.

3.10.4. Pilot test the interview protocol (IPR Step 4)

Several challenges facing novice researchers emerge from collecting data from different resources within the case study approach. Conducting pilot studies before the primary research has been suggested to provide the researcher with sufficient training and practice for various techniques (Yin, 2003). Merriam (2009, p.104) also indicates that “the best way to tell whether the order of your questions works is to try it out in a pilot interview”. Therefore, the researcher recruited several participants from the targeted study population (academics and students) except librarians who were from the University of Sheffield to modify the interview questions

before the data collection period. This is because the sample population for librarians is small at KU.

3.10.4.1. Pilot librarian focus group discussion

The online focus group discussion lasted one hour with two academic librarians from Sheffield University who were English and use IL professionally, and so they were familiar with the SCONUL model. It was done virtually using Google Meet Application. The Doodle application was also utilised to arrange the appropriate time for all group members. It allows the researcher to share a calendar with the participants by sending plenty of invitations with different times and dates to choose the suitable one for all group members. Having selected the appropriate time for the online pilot study by the librarians, an information sheet and consent form were sent to the participants to read and sign before the meeting.

During the actual meeting, jam-board (see appendix 4, p. 317) was exploited to let the participants reflect on IL conceptions and chat space to write the interview questions down to the assistant before the researcher asked them. The assistant was a person who helped the researcher in administering the discussion effectively. The interview was conducted in English and audio recorded after gaining permission from the interviewees and then automatically transcribed by Microsoft 365. This transcription was sent to the researcher's supervisors for more critical suggestions.

The primary purpose of the pilot study is to receive feedback on the developed interview protocol. Therefore, the researcher sent the Activity Checklist (see Appendix 5, p. 318) developed by Castillo-Montoya (2016) immediately after the focus group discussion to the participants for a close reading of the interview protocol. This Checklist consists of 15 items to obtain helpful feedback on the interview protocol from the participants to enhance its reliability and trustworthiness as a research instrument. The interviewees were also asked to feel free to give feedback and any other suggestions beyond the scope of checklist items.

Upon the feedback emerged from the checklists, the participants provided valuable suggestions and important issues were highlighted as interview protocol improvement, including:

- Technical issues related to the Internet quality because it was intermittent, resulting in difficulty hearing the questions.
- Issues resulting from conducting interviews in online mode, and therefore, it was suggested to be done face-to-face to allow for much more free-flowing conversation.
- Before moving to the next question, it might be helpful for the interviewer to make sure that all participants have nothing else to add.

Another important point that emerged from the transcription of the pilot focus group is that the researcher should not neglect the process of repeating participants' names in the actual focus group. This technique helps the inquirer recognise who is who (Morgan & Krueger, 1998); thus, it is also critical for transcription.

3.10.4.2. Pilot academic interviews

Two face-to-face interviews were conducted with academic staff from the Nuclear Medicine Department at the FOM because they teach medical students from both phases: preclinical and clinical. The exact process was done: giving an information sheet and consent form, data audio record and transcription, and providing the Activity Checklist. The participants provided feedback about the IL document, which was used to introduce the topic.

Both participants negatively reflected on the Seven Pillars SCONUL diagram attached in the introductory document (see appendix 3, p. 316), which was used as an illustration tool during the interview. They reported that the name of pillars in the model diagram is brief, and they need to help understand what the seven pillars (e.g. scope, plan, identify) mean. So, it requires more explanation to be easy for us to understand the meaning of each skill of the Seven Pillars model. Based on this feedback, the researcher developed a new version with more explanations for each pillar to involve a brief introduction, as shown in Appendix (6, p. 319). By doing so, the researcher realised the effectiveness of this change through the following actual interviews.

One of the advantages of piloting includes reordering interview questions to increase the flow of conversation (Jordan et al., 2021). Thus, the researcher realised that the participants faced difficulties answering questions associated with IL conceptions. This may result from unfamiliarity with specialised terminologies such as IL, particularly for those who need to become more familiar with Information science. Therefore, the researcher rearranged the interview questions by asking IL conception-related questions at the end. In this way, the researcher ensured that the conversation flowed smoothly in the actual interviews, and it was easy for the participants to reflect on their IL conceptions after they fully engaged with the dialogue and understood the topic.

3.10.4.3. Pilot student interviews

Due to the circumstances of COVID-19, two virtual interviews were carried out via the Google Meeting Application with students from phase (III) who are from the FOM, KU. They were chosen because final-year students can reflect on their experience through the seven-year medical programme and answer all interview questions allocated to the three-phase students. The same procedures conducted in lecturer interviews were followed. The same outcomes,

realised in the pilot lecturer interviews concerning reordering the questions particularly associated with questions of IL conceptions to ensure that the conduct of the interview is flowing more freely and easily, were observed. As a result, the researcher decided to reorder the interview questions, making IL conceptions questions to be asked at the end.

3.11. Data collection process

The data was collected from medical academics, librarians and undergraduate students over five months from June to October 2021 as well as from the relevant documents which will be discussed in the following sections.

3.11.1. Medical academics

The researcher tried to approach the academic participants through sending invitational emails but had no responses. Having failed the first attempt to get responses of accepting participation by email from academics, contact was made to the dean of FOM asking for help with the disseminating and circulating the recruitment email. As a result, face-to-face semi-structured interviews with 18 academics were conducted. The revised guided document used in the interviews (see Appendix 6, p. 319) was circulated to the participants at the beginning of the interviews to make sure that the interviewee had a look at it. The consent form was also given to the participants to be read and signed before the discussion began to seek their permission to record the interview orally.

3.11.2. Medical librarians

Despite Covid-19 conditions, the researcher interviewed the librarians in a face-to-face focus group discussion, taking potential measures such as face-mask wearing and keeping distance. This essential step was taken based on online pilot study focus group observations and recommendations, discussed below in the pilot study section.

About focus groups, in addition, the list technique was used, which helps identify a large number of and the most relevant items (Morgan & Krueger, 1998). Several blank sheets were given to the participants to write down their conceptions of IL in enough time (about ten minutes). This allowed them to reflect on their experience defining IL and jotting down each information skill they think related to IL.

3.11.3. Medical undergraduate students

Due to COVID-19 circumstances, all medical students were approached online and recruited based on the medical faculty student union's recommendation. To ensure a high response rate, it was recommended that the research-related information sheet should be distributed among WhatsApp groups involving most medical students from the three phases. Thus, it was an effective strategy that the participants agreed to participate in the study voluntarily.

Online semi-structured interviews were carried out with 31 medical students. The same previous steps were followed. They handed in the consent form to obtain permission to record the meeting. The average length of the interviews was 30 to 60 minutes, all entirely voluntary.

3.11.4. Documents

The researcher decided to collect the most relevant documents speculated to contribute to a better understanding of IL phenomena within the setting of the FOM and then use them as a supportive instrument for interview evidence. Therefore, the relevant documents were collected in two stages.

In the first stage, the researcher examined the FOM's website to identify the relevant documents related to pedagogical approaches and the faculty policy before the conduct of the actual fieldwork. Therefore, documents such as undergraduate students handbook and computer into medicine module outline were purposively identified and then accessed online as well as the webpage of HSCL was accessed. This process helped the researcher to gain sufficient background knowledge of the research design, to identify the existing IL practices and policy, and to successfully proceed to collect data from interviews in the second stage.

In the second stage, public documents available on the official websites of KU and private sources such as IL instruction activities records, minutes of meetings and annual reports were gathered and accessed. Another helpful document relating to IL teaching strategies (class hand-outs, faculty teaching materials, course syllabus) and IL assessment strategies (assignment worksheets, faculty-developed rubric) were also gathered. Moreover, the document stemmed from the interviews that were followed up.

Before the interviews, contact was made mainly with the academics, librarians and students to seek any related documents. For example, the head of HSCL advised the researcher to go through the library website because, as the head of HSCL stated recently, most IL-related documents have been digitised and uploaded. So, it is beneficial to browse the website, particularly the Training & IL section, to see how IL is practised within the context of FOM.

Concerning students, they were asked if it is possible to provide the researcher with any assignment or research project they have conducted that might stimulate and brainstorm any new themes. Other helpful documents, including the EBM modules' outlines, student guide for CMBS projects, Computer into Medicine module outline and curriculum, English language 181, 182 and 183 outlines and curriculums were also collected from the academics and students to enable the researcher to gain a better understanding of the case. These were collected from the above-mentioned participants as well as downloaded from the FOM's websites to enhance the evidence emerged from the interviews and focus group discussion. Data sources, collection methods and the sample size used in this study are summarised in table 3.5.

Data sources	Methods	Sample size
Academics	Semi-structured interviews	18
Librarians	Focus group discussion	6
Undergraduate students	Semi-structured interviews	31
Documents	Identifying documents	HSCLA websites, students' assignments, undergraduate student handbook, student guide for CMBS project, computer into Medicine module outline

Table 3-5 The case study's sources, methods and sample sizes

3.12. Interview transcription

All the interviews were conducted in the participants' preferred language, either Arabic or English and digitally recorded. Following this, they were transcribed according to the language through which they were carried out. English interviews were automatically transcribed using Microsoft 365 Word Processing software. Still, the researcher matched the written transcripts with the original audio records to avoid any technical errors that could have occurred by the software. Therefore, the researcher listened to the audio records more than once to check that they were fully transcribed correctly and to ensure they were error-free.

Although manual transcription is considered a daunting task and time-consuming process (Saunders et al., 2009), the rest of the Arabic audio records, the majority of interviews, were transcribed manually by the researcher. This procedure also provided him with an excellent opportunity to immerse himself in the collected data set. It enabled him to make notes of initial ideas before commencing the systematic coding process (Willig, 2013). To ensure that all

transcripts were devoid of errors, the researcher listened back to the recordings while reading the transcripts.

3.13. Analysis of data

As the focus group discussion and semi-structured interviews were transcribed, the analysis process commenced with MAXQDA software, which supports many languages, including Arabic, which others like NVivo cannot support. Data analysis of case study research is still daunting and needs definite analytic procedures and guidelines (Eisenhardt, 1989). Due to the nature of the single case-study design with embedded analysis sub-units, the analytical process involves two stages: within-units and cross-units analysis (Merriam, 1998). Engagement in such rich analysis is robust and serves to illuminate the case better (Baxter & Jack, 2008). within-unit of analysis stage, data were thematically analysed inductively and deductively (RQ 1 & 3: using inductive approach; RQ 2: using inductive and deductive approaches where SCONUL Seven Pillars Model (2011) was used as analytical framework). All units and documents in this stage were analysed individually. Regarding the cross-units analysis stage, all findings emerging from the individual units were synthesised in a single unit to look for within-group similarities and intergroup differences. Figure 3.2. explains how the process of analysis was conducted in both stages: within-units analysis and cross-units analysis. To achieve the purpose of this study, the analysis was conducted as described in the following subsections.

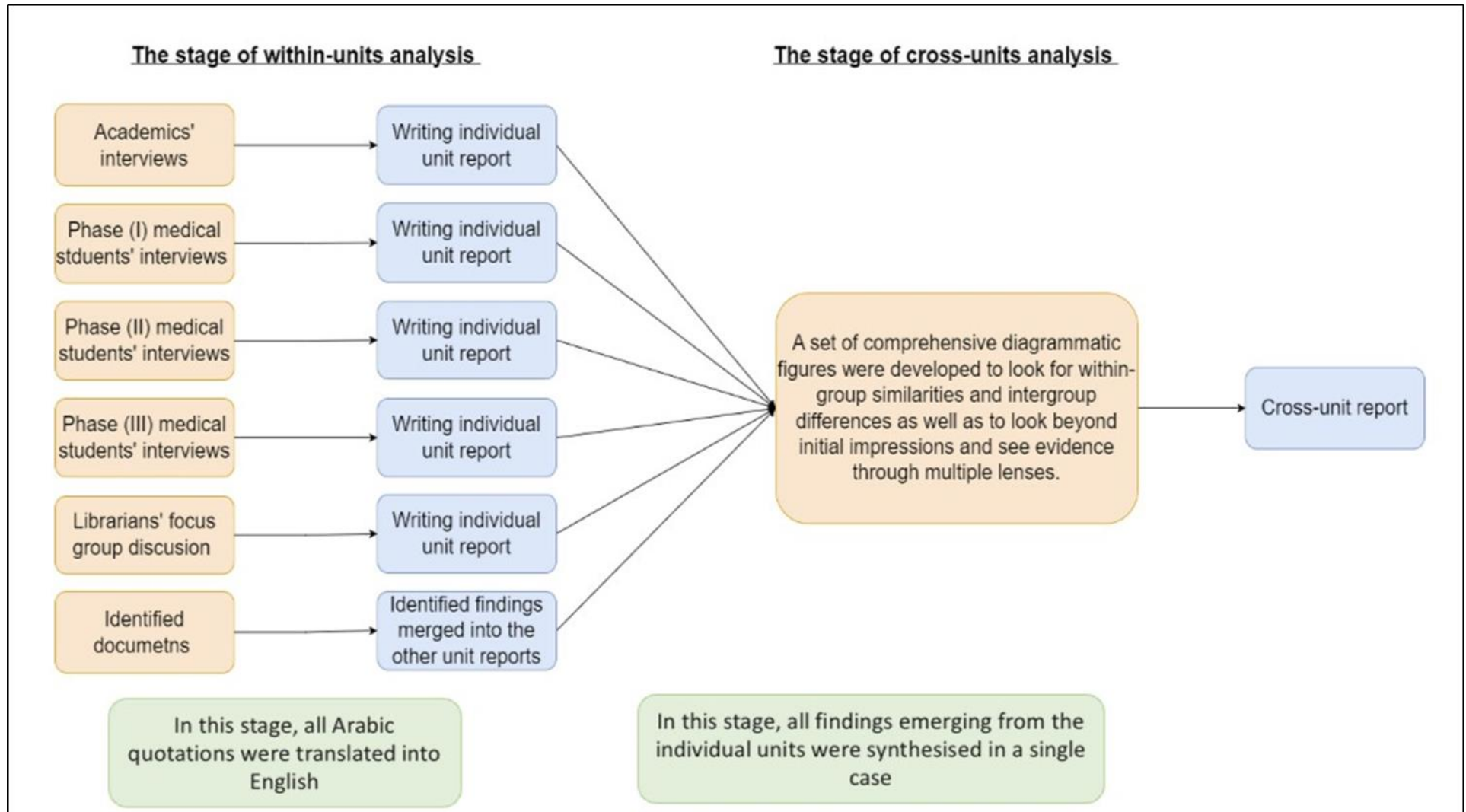


Figure 3-2 The process of data analysis

3.13.1. Within-units of analysis

In this stage, each detached unit of the case is treated and analysed separately and comprehensively in its own right. When data is gathered, the researcher can learn and discover the contextual variables that affect the case (Merriam, 1998). The principal idea behind this stage is to enable the researcher to gain familiarity with each case. Thus, unique patterns can emerge before generalisable patterns are identified across every case (Eisenhardt, 1989). Therefore, the researcher started analysing the data from the medical academics due to their experience in teaching IL to draw an initial picture of what was going on. For this study, three different units of analysis are embedded in the whole case, as illustrated in section (3.7) above. In this analysis stage, each unit was analysed separately before comparing them in the following analysis stage (cross-units of analysis). Other sources of evidence (e.g. academics, librarians, documents) were also analysed during this stage individually.

A thematic analysis method was used during the stage of within-units analysis because “there is no standard format for such analysis” (Eisenhardt, 1989, p. 540). It provides new researchers with an accessible and robust analytical method that helps them develop, analyse and interpret patterns across data sets by adopting systematic coding procedures, resulting in theme generation, which is the ultimate goal of the analysis process (Braun & Clarke, 2022). It also refers to a method that identifies, organises and reports themes and concerns while organising and describing the data in more detail (Braun & Clarke 2006). It is described as a flexible analytic tool, widely used by case study researchers and scholars of social science and humanities, given its capabilities to yield insightful interpretations grounded in context (Braun & Clarke, 2006). Furthermore, thematic analysis can be taken for different research philosophies because it is not associated with any theoretical framework (Braun & Clarke, 2006; Mills et al., 2012), but instead, it is a standard method widely used to address a variety of research questions grounded in different theoretical commitments like realism, phenomenology or social constructionism (Willig, 2013). Hence, the thematic analysis method was adopted as an analytical framework suggested by (Braun Clarke, 2006) for this study, which consists of six iterative steps. The analysis process was executed as described in the following subsections.

- **Step 1 Data familiarisation**

Braun and Clarke (2022) emphasise the significance of the familiarisation phase in thematic analysis to generate initial thoughts and ideas before commencing the coding process. They point out several practices that can be followed by the qualitative researcher to engage with the

dataset and to gain deep familiarity with the content. To develop the desired intimate knowledge of the dataset, the researcher executed the transcription process through which the digital audio records were turned into written texts using Microsoft Word, enabling him to obtain an initial overview of the data. Then, he immersed himself in data sources by reading and rereading the transcripts line by line and segment by segment several times. These practices, in turn, enhanced his familiarity with data and helped him determine the initial configuration of ideas by making notes of thoughts related to the dataset. By doing so, patterns, potential codes and themes were identified in this stage.

- **Step 2 Generating initial codes**

After immersion in the dataset, all the interview transcripts and relevant records were uploaded to MAXQDA Plus 2020 software. Such a program provides the researcher with helpful tools for proficiently sorting, organising, managing and analysing massive datasets. It facilitates the coding process, which is considered the cornerstone of analysis. According to Saldana (2011), coding is a systematic and cyclical process that aims to generate categories, themes and concepts which capture meaning and construct theory. Braun and Clarke (2022) describe it as a process in which a label is given to particular segments of each data item to explore diverse meanings from the dataset. It is argued that coding requires engaging with data systematically by reading the dataset closely, which only happens during the generating initial code step and labelling all data segments to develop meaning related to research questions (Braun & Clarke, 2022). The following screenshot of MAXQDA software (see also appendix 7, p. 320) illustrates how the researcher tagged all the meaningful segments of the text that are the most relevant to the research questions using the initial (open) coding technique as shown in figure 3.3.

Through thematic analysis, data can be coded using an inductive and deductive approach or a combination of them (Willig, 2013). The researcher analyses the data in the former without depending on the precedent theoretical coding frame. This means that the emerging themes are firmly rooted in the dataset and are not influenced by the researcher's theoretical orientations. By contrast, the researcher, in the latter, benefits from existing templates generally derived from the relevant literature to guide their coding development and then produce themes based on it (Willig, 2013). For this study, the researcher used both approaches to the process of thematic analysis in which a prior IL model (SCONUL, 2011) was utilised in coding and organising the data deductively. Novel themes were also enabled to emerge and develop inductively from the analysis.

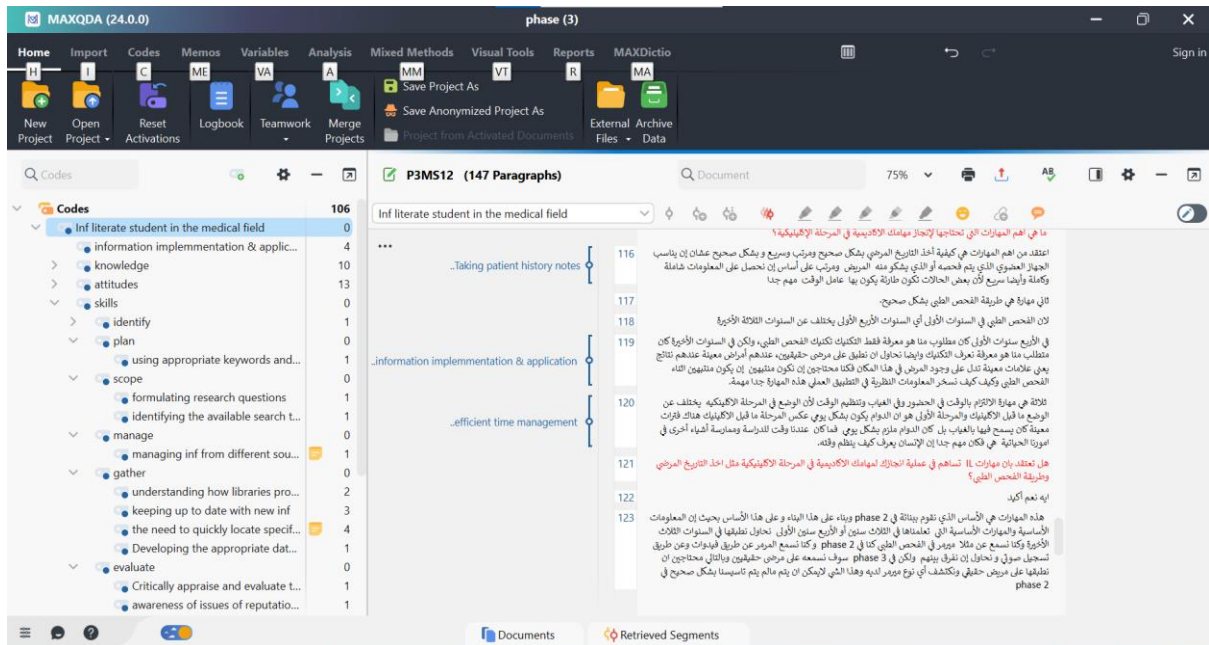


Figure 3-3 An example of using MAXQDA in the process of coding

Braun and Clarke (2022) argue that inductive orientation can be the best approach to developing codes, patterns and themes, especially when the researcher tends to discover the participants' perspectives, experiences and meanings regarding the specific phenomenon. Therefore, the inquirer of this study analysed the dataset inductively to allow some themes to emerge directly from the data that have strong connections to specific research questions closely related to the interviewees' IL meanings in the medical field and their experiences of ILE. To ensure the thoroughness and rigorousness of the coding process, the researcher moved back and forth between the previously coded dataset and the current coded one to make critical notes systematically, as suggested by Braun and Clarke (2006, 2022). The researcher refined and interpreted the initial emergent codes to ensure further values and analytical categories were developed and modified.

Regarding deductive approach to coding, Boyatzis (1998) identifies several reasons behind applying an existing thematic code (prior-research-driven method development) to qualitative data. One of the reasons is that the researcher tends to use earlier studies to replicate, extend or refute previous discoveries. The following diagram (Figure 3.5) clarifies how some specific aspects of codes, categories, subthemes and themes were deductively identified based on the SCONUL model (2011) and how newly emerging themes as new skills (e.g. Information

implementation and application, synthesising information and interpersonal and communication skills) were developed as new insights and then integrated into the body of the model to extend it to be adaptable “for different user populations [medical students] to enable the model to be usable in specific situations [The Faculty of Medicine]” (p,3).

Braun and Clarke (2022) suggest that thematic analysis is likely more deductive when a strong relationship between ideas is recognised at the beginning of the process. Then the researcher begins to code around such concepts, particularly regarding the aspect of what shapes information-literate students in the medical field; several concepts, such as knowledge, skills and attitudes, which are defined at the heart of IL development of medical students, were noticed in the dataset by the researcher at an early stage of the analysis process.

During the analysis process, the researcher started coding the collected data inductively. In this phase, the analytical framework (SCONUL model) was set aside in order to ensure that the analysis process was first driven by the data rather than guided by the preceding coding framework. This action was taken to avoid any possibility in which some codes or themes are neglected or missed because of the influence of the analytical framework during the deductive analysis phase. Inductive coding is helpful because it allows for unexpected themes and new insights to naturally emerge. This is obvious through the aspects related to IL conceptions (e.g. taking critical decisions in a humanitarian way) which is regarded as a new understanding that has not previously been discussed in the IL literature.

Braun and Clarke (2022) suggest that thematic analysis is likely more deductive when a strong relationship between ideas is recognised at the beginning of the process. Then the researcher begins to code around such concepts, particularly regarding the aspect of what shapes information-literate students in the medical field; several concepts, such as knowledge, skills and attitudes, which are defined at the heart of IL development of medical students, were noticed in the dataset by the researcher at an early stage of the analysis process. During the deductive phase, all codes and themes that emerged inductively above were mapped against the SCONUL model with the purpose of ensuring that there are no any codes have been missed and seeing what new codes have been generated.

The inductive and deductive coding was characterised as an iterative and continuous process wherein the researcher continued analysing the transcripts for an extended period as new codes were derived until reaching the saturation phase, where no codes could be added. Despite the benefits of using the combination of inductive and deductive approaches to the coding process,

a number of challenges and tensions can be faced. For example, corresponding themes emerging inductively to a predefined deductive framework (SCONUL model) can be one of the biggest challenges of using both approaches. For this study, not all themes emerged from inductive coding (e.g. communication skills) fitted well with the frame of the SCONUL model. Therefore, the “Present” pillar has been broken down into several aspects as shown in figure (3-5) below to accommodate the new themes and codes that inductively emerged in order to mitigate some of the tensions such as the possibility of leaving out any inductive codes or forcing the data with the structured approach of deductive coding.

- **Step 3 Searching for themes**

During this phase, the researcher tends to refocus their analysis by locating the potentially connected codes identified across the data set in the previous step to construct overarching themes related to the research questions (Braun & Clarke, 2006). Theme is a pattern that captures interesting and meaningful meanings across the coded dataset and has multiple facets of a concept, different from code with only a single aspect of an idea (Braun & Clarke, 2022). For this study, themes were constructed upon the nature of research aims, objectives and questions to develop a suitable information literacy model for medical students at KU. In this phase, a considerable overlap between the code development stage and preliminary theme identification may be revealed. This was recognised when the researcher examined the fitness of some codes into specific sub-themes. For example, at an early stage, several regulations were associated with the attributes of information-literate students in the medical field. These codes (e.g. passion, willingness, wanting to learn, self-regulating learning) were grouped under an initial theme called Attitudes. In the end, however, these codes had been collated into a more focused subtheme called Motivation, which is more overarching and reflects more specific and detailed features of such principles. An essential advice suggested by Braun and Clarke (2022) for this phase is that it may be robust to utilise visual representations such as mind maps or tables to organise the different codes into themes. Hence, the researcher developed many mind maps (see appendix 8, p. 321) using mindmapmaker.org to recognise the relationships between principles, themes and different levels of themes, as shown in Figure 3.4

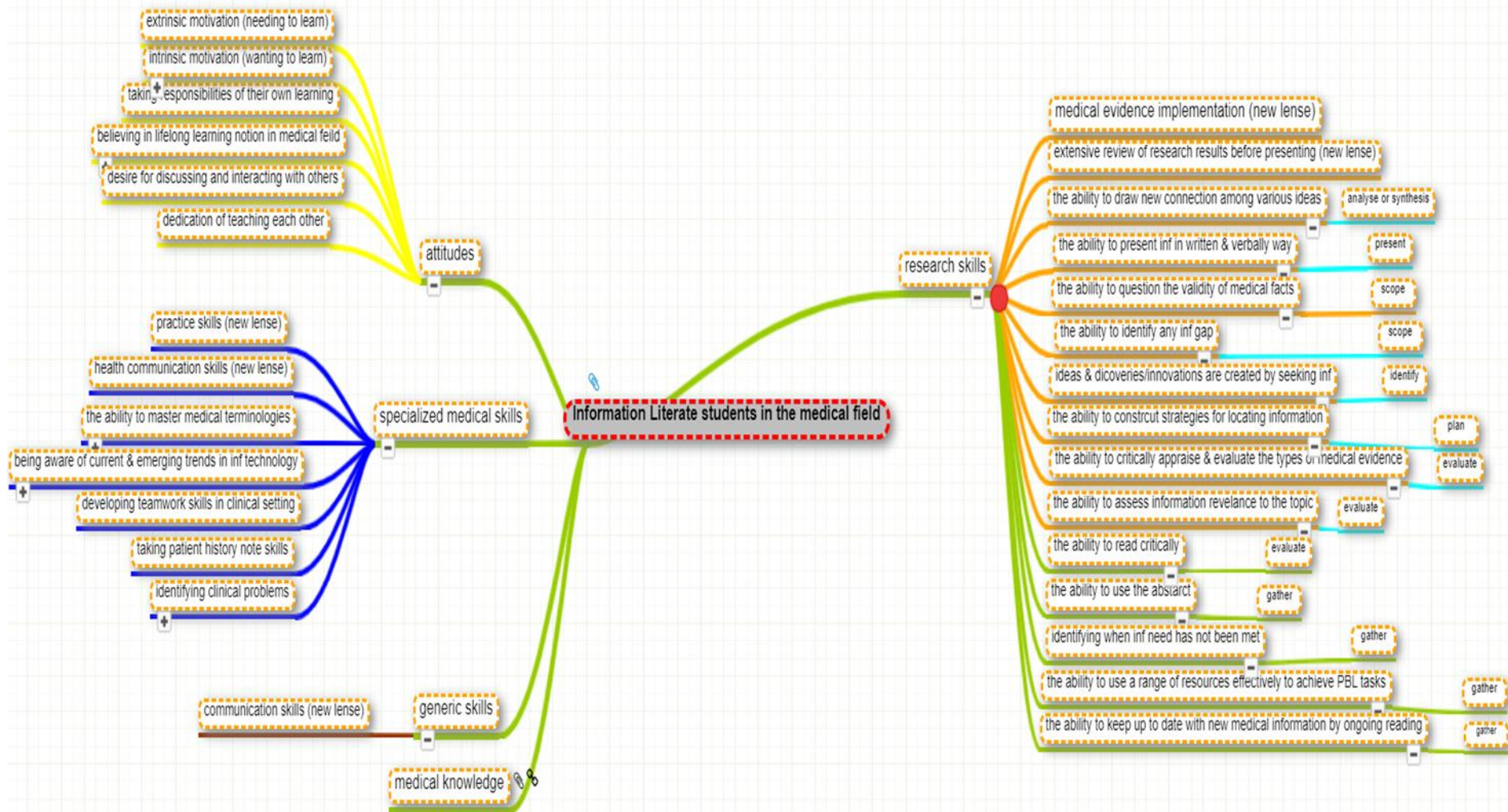


Figure 3-4 Initial thematic map, showing five main themes of an overarching theme (extracted from academics' dataset)

- **Step 4 Reviewing themes**

According to Braun and Clarke (2006), this step focuses more on reviewing, refining and modifying the preliminary themes developed and identified in the previous step. In addition, it aims to ensure the emergent themes' validity in the data set and the extent to which the devised thematic map matches the entire data set. During this phase, some themes can be broken down into separate themes or might need to be integrated into the existing current themes, as others can also emerge as novel themes due to extensive review. Based on Braun and Clarke's (2006) recommendations, the researcher read the data related to each theme to consider whether the data supports it and to what extent such themes work and fit well into the whole data set. Hence, some critical changes have been made to the initial thematic map.

The total number of themes was reduced to four main themes rather than five themes subsumed under the overarching theme of information literate student attributes in the medical field derived from the medical academics' dataset, which was the first source analysed and coded. For example, themes such as specialised medical skills and generic skills were broken down and collapsed to be merged into the other themes, particularly knowledge and skills. The researcher found that codes such as communication skills under the generic skills theme, as well as health communication skills, teamwork skills in a clinical setting and taking patient history notes under the specialised medical skills theme, can be taken out to be introduced into the skills theme in particular under application and communication as a new subtheme. Codes such as being aware of current and emerging trends in information technology and medical terminology were also extracted from specialised medical skills themes to integrate into knowledge themes, making significant changes on the codes' labels and tags to fit well with the nature and coherence of themes. It was also observed that there was a theme (practice skills) within the specialised medical skills theme that can stand alone as a separate theme, which has been modified to become a later information implementation and application.

From the review of coding, the variation in conceptions of IL became evident. Thus, although the methods employed in this study were not phenomenographic, the researcher was able to discover varying conceptualisations of IL in the data. These conceptualisations, gathered in three categories, are closely similar to those identified in phenomenographic studies in the IL field (i.e. Boon et al., 2007; Bruce, 1997; Forster, 2015a, b) despite the differences in how data are gathered and analysed of both case study and phenomenography approaches. In this study, for example, the researcher asked specific probing questions about the participants' IL practices and showed them pre-existing IL models to help them reflect on their experiences. In contrast,

phenomenographic researchers constantly circulate the central question of how IL is experienced. While describing it in the interview, the researcher's ideas about the phenomena studied are always invisible to the participants. Despite their different procedures regarding the prompts and the guide model displayed to the participants during the interviews, the analysis showed that other ideas about IL were discovered and experienced differently. Therefore, the case study approach used in this study was still valid in identifying different categories in which IL was experienced and described.

- **Step 5 Defining and naming themes**

As Braun and Clarke (2006, p. 92) illustrate, this phase aims to “identify the ‘essence’ of what each theme is about... and determine what aspect of the data each theme captures”. They suggest that it is essential to return to the relevant data items of each theme to “identify what is of interest about them and why”. Significant accounts related to the themes can also be identified during this phase. The relationships between themes and subthemes should be further considered, and how they interact and associate with themselves and each theme about others. For this analysis, an information-literate student in the medical field is one of the overarching themes grounded in the other themes. Figure 3.5 shows an example of the mind map on this particular concern with the themes emerging from the medical academics' dataset which relates to describing information literate students in the medical field. It provides the final picture of themes and subthemes at the end of the refinement phase. It explains how they fit together to tell the overall story of the data about the characteristics of information-literate students within the context of the FOM at KU.

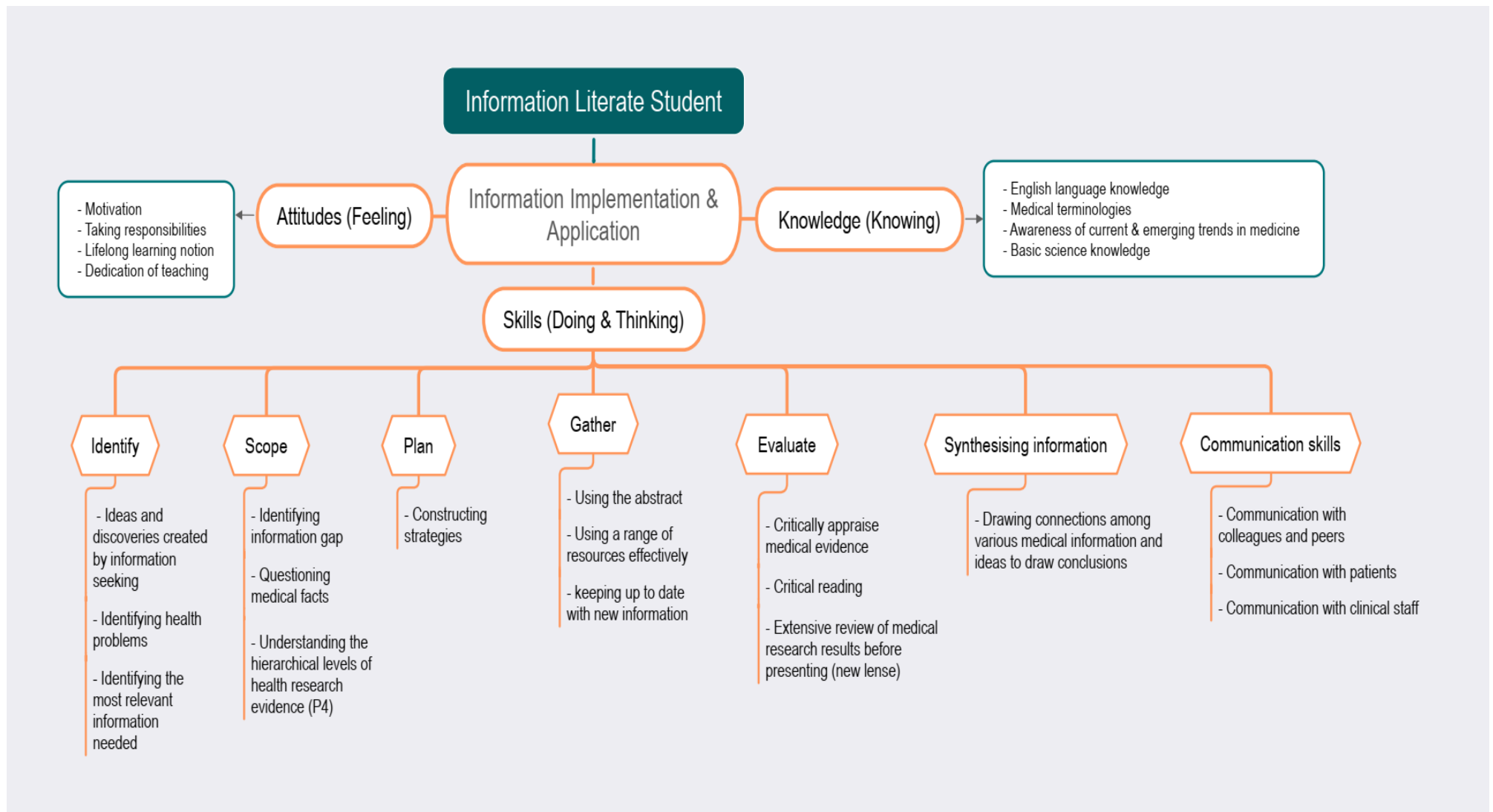


Figure 3-5 Final thematic map, showing the final four main themes of an overarching theme of Information Literate Students in the medical field from Medical academics' perspectives

Information literate students in medicine are seen as those who should acquire the necessary knowledge and develop several research, medical, scientific and communication skills supported by several valuable attitudes such as taking personal responsibilities towards their learning, information search and IL development. This development substantially contributes to achieving the ultimate goal of the medical discipline, which focuses mainly on successfully implementing information in the clinical context efficiently and effectively.

Braun and Clarke (2006) indicate that the names of themes during this stage should be double-checked to be more concise and consistent with the nature and scope of themes, giving detailed descriptions of theme meaning. Therefore, several significant changes have been made to some themes' titles to reflect their content and essence. For example, the skills theme was renamed to "skills" rather than "research skills" to include a variety of behavioural and cognitive skills that medical students need to develop in an academic or clinical setting. The medical knowledge theme was also changed to be a knowledge theme, which allows for different kinds of knowledge, like English language and medical terminologies, to be involved.

- Description of themes and codes

The following table extracts the established codebook (see Appendix 9, p. 322). The attitude theme was identified as a significant characteristic of information-literate medical students within the context of FOM at KU.

Code	Definition	Examples (quotes)
Motivation	Including the internal and external factors that drive medical students to behave or act in a particular way to be efficient and information literate in the medical field.	<p>"I think it depends on the person. There is a student who wants to learn, and his objective goes above and beyond just passing the exam. However, not everyone has that drive or motivation actually to seek information beyond the curriculum" (P2MS6)</p> <p>"I think that the most important habit that medical students have to develop during the clinical phase is to have the passion for hospital work and being around doctors in a real-life setting because that will reflect positively upon them in terms of the amount of information they will acquire" (P3MS10)</p>

		<p>They probably do not see these skills as necessary, so they do not want to put much effort into learning them. But if they appreciate their importance [IL], and they have self-motivation which must be getting out or stemming from their inside perspectives otherwise you can force it” (MA18)</p> <p>“What is even worse is that the PBL module does not have any weight when calculating students’ grades because all a student has to do is attend two sessions to be entitled to sit the final exam, which gives students the impression that information literacy skills are not as important to acquire or focus upon as the memorisation skills to pass the examinations successfully. The solution is to place equal emphasis upon the development of both PBL and memorisation skills, as a combination of both will produce outstanding and creative doctors” (MA14)</p>
Initiative	This trait is seen as taking the initiative to seek additional information to learn or divide the knowledge gap to make a medical decision.	“There is also the matter of moral courage. Even when you feel your information is lacking in this field, you should have no problem asking someone more knowledgeable for help. There is no place for timidity if you want to learn, especially in the medical field, where you are ultimately responsible for the lives of your patients” (P2MS12)
Open-mindedness	It includes being receptive to new ideas, perspectives and information without rejecting them based on preconceived beliefs	“I mean we have to learn how to listen to each other, cooperate and be open to other opinions that may be different from our own and consider all arguments for and against because other opinions may just be the right ones” (P3MS12)

	<p>or opinions. Open-mindedness can be demonstrated in various ways, including listening actively to others, considering multiple views on a medical issue, and expecting multiple diagnoses and possibilities.</p>	<p>“Any person, whether a medical student or a physician, has to be broad-minded and not stuck in a specific rotation. That helped broaden our horizons because we do not have to focus only on surgery topics during our surgery rotation or paediatric topics during our paediatrics rotation. So, I think the key is really to keep an open mind and to go through all potential possibilities” (P3MS2)</p>
Curiosity	<p>For this research, curiosity is defined as the strong desire to know about the latest developments in the medical field. It is also the inclination to check the accuracy and validity of medical information and evidence before accepting it.</p>	<p>“...Medical students have to have a healthy curiosity and always try to understand and even question the accuracy of the information they are given and not take it for granted. They also need to be curious to read in-depth to keep updated with the latest medical developments and innovations” (P3MS3)</p>
Taking more responsibility for learning	<p>By taking more responsibilities to develop a sense of accountability for their education and help them remain committed to gathering their information from various sources and critically evaluate it to achieve the vision of independent learning that MOF seeks to achieve, particularly in the clinical phase.</p>	<p>“Yes. So, unlike the preclinical years, when we spoon-fed the information, the clinical years are about being more self-dependent and developing ways to look into approved resources. So, the skills that you most need is those that enable you to recognise which databases are reliable and which are not, because, you know, this is not a joking matter” (P3MS1)</p> <p>“But when I got to the clinical phase, I became more self-dependent and more involved in self-learning since the syllabus was not as well defined as in the preclinical phases 1&2. So, I started to search for more information in as many sources as</p>

		<p>possible so as not to be dependent upon a single source” (P3MS10)</p> <p>“So the lifestyle is very problematic here[Kuwait] intuitively as they need to take a learning process more seriously, I think it is the most important thing” (MA12)</p>
Extrinsic motivation	<p>The codebook has shown an overlap between the code of motivation and extrinsic motivation. They share the same values that medical students must possess to develop a particular behaviour. Therefore, they have been merged under one code, “Motivation.”</p> <p>In addition, the academics have only pointed out this code as inhibiting factors that affect medical students' development of IL once the PBL activities have been ungraded. Therefore, lack of motivation due to the absence of external incentives could be subsumed under the category or sub-theme of the factors affecting IL</p>	<p>“In the past, PBLs had 5% of students’ total grade scores, but this percentage has been removed from their assessment system. So now, when you see students in the PBL classes, you can observe that they are not as motivated as their previous colleagues were because they know that tutors cannot set questions in the exam from the PBL content, and this content will not assess them. Still, all they need is to attend the class. You can imagine that students attend the attendance sheet without any learning motivation or interest in the topic. Compared to the situation in the past, there were some questions set in the exam from the PBL material so that students were much more motivated” (MA18)</p> <p>“What is even worse is that the PBL module does not have any weight when calculating students’ grades because all a student has to do is attend two sessions to be entitled to sit the final exam, which gives students the impression that information literacy skills are not as important to acquire or focus upon as the memorisation skills to pass the examinations successfully. The solution is to place equal emphasis upon the development of both PBL and memorisation skills, as a combination of</p>

	development in the context of FOM.	both will produce outstanding and creative doctors” (MA14)
Lifelong learning notion	Believing in lifelong learning is essential for medical students, as it enables them to stay up-to-date with the latest medical knowledge and practices. By promoting such a notion, medical students would be motivated to seek information beyond the curriculum and develop skills that significantly foster lifelong learning.	“In fact, not only through the first seven years in an undergraduate Medical program, no, it is from the year one tells the graveyard once they realise that, okay, it is a continuous cumulative process. And this requires, you know, being on the top of the knowledge gaining, okay, and this, it has to be implemented in their mind, and their way of thinking from the beginning is not only just a course they have to pass, but it is also a lifestyle” (MA15)
Dedication of teaching	In this code, the idea of constructive learning and teaching must be promoted in the mentality of medical students from an early stage. They must develop an attitude of teaching and learning from each other honestly and diligently.	“They want to teach their colleagues with honesty and dedication..., in the future, as future physicians, okay, when they go to the clinic, that is what they must do. They have to learn and teach at the same time as teaching colleagues. The seniors teach the juniors...” (MA15)
Determination	Medical education is a rigorous process that requires persistent reading and hard work. So, medical students must demonstrate a high determination	“A medical student must be a persistent reader to be able to build his database, which is then expanded by seeing more patients apply theoretical information in a practical/clinical context correctly” (Lib5)

	to build a robust knowledge base and develop the necessary skills to become competent physicians.	
Being patient	Medical students are overwhelmed with coursework, clinical rotations and other responsibilities. Patience is essential to avoid becoming a burden through promoting persistence and a positive attitude towards learning and professional success.	<p>“During most of our shifts at the hospital, we have to interact with patients and professors, and the main thing you have to have is much patience to tide you over the work pressure and the professors’ constant demands. Only a medical student would know how exhausting work at the hospital is, especially if having to study is combined with having to attend night shifts” (P3MS5)</p> <p>“A student must learn to have the patience to make the transition successfully” (Lib4)</p>

Based on the codebook, the above codes can be grouped under one inclusive category or theme labelled as an attitude. It can be defined as a set of beliefs, interests, feelings, emotions and motivations that constitute a vital component of the personality of a medical student as information literate within the context of FOM at KU. These affective and attitudinal aspects are recognised as significant elements of IL (Gumulak & Webber, 2011). Still, they are less focused on the literature on IL despite their significance for IL education and motivation (Nierenberg, 2022), and as a result, most IL models and standards (e.g. SCONUL, 2011; ACRL, 2000 & ANZIL, 2004) have neglected such significant attitudinal aspects (Secker & Coonan, 2011; Walton, 2017). Nierenberg (2022) found a strong connection between affective dimensions and students’ IL learning. Thus, she suggests it is more valuable for IL educators and practitioners to integrate this aspect into their IL instructional activities, practices and assessments to prompt students’ attitudes towards their learning and maintain this interest over time.

Table 3-6 Codes and theme for analysis of characteristics of information-literate students

- Step 6 Producing the report

It is the final stage of the thematic analysis process in which all the research data is combined in a detailed account. It tells the complex narrative of the research data in a way that makes the reader more confident of the validity and merit of the analysis (Braun & Clarke, 2006). According to Merriam (2009), a detailed description of case study reports is required to give

the reader the vicarious experience of the research setting and assess the evidence on which the analysis depends. These vivid descriptions are expected to be any length based on the described context or a specific point that needs to be illustrated. For this research, the results of each unit of analysis and other different sources of evidence (medical academics and librarians) were presented in detail with illustrative quotes in separate chapters (4,5,6,7,8). Then, they were compiled together to be compared and contrasted to answer the research questions and explain the holistic picture of how information-literate students in the medical field should be; finally, the findings were discussed and linked to the literature in chapter (10).

3.13.2. Document analysis

The above-collected documents (see section 3.11.4) were primarily used to support the evidence derived from interview data and describe the case in detail by providing additional information. So, document data were introduced in most case study reports after analysing them to gain a better understanding of IL practices in the FOM and to contribute to the whole picture of being information literate individuals within the FOM. For instance, when phase (II) medical students did not mention acquiring medical terminologies as an essential aspect of being information literate in the medical field, the research referred to related documents to determine the importance of such attributes.

Documents can be analysed quantitatively using the content analysis technique, which involves counting how often something occurs within the documents (Merriam, 1998). Alternatively, they can also be analysed qualitatively, using the TA approach by examining different subjects covered within the selected documents (Oates, 2006). As mentioned above, the documents used in this research were collected in two phases. For example, in the first phase, before undertaking the interviews the researcher was identifying policy and curriculum documents (e.g. undergraduate students handbook, the webpage of HSCL). Then, they were read and examined for evidence of engagement with IL and evidence of overall and existing pedagogical approaches and policies. This evidence was synthesised into the case study introduction and also to provide background knowledge to improve engagement in the interviews. Thus, all documents gathered in two phases were uploaded to MAXQDA software. Then, they were stored and sorted in the document folder to code and analyse them thematically.

3.14. Translation

Most of the interviews were mainly conducted in Arabic because this study occurred in Kuwait, and thus, Arabic is the official language of Kuwaiti people. However, some interviews were conducted in English due to the participants' preferred choices and the mother tongue of the

interviewees. Merriam (2009) proposes two strategies when interviews are conducted in a language different from English. First, the transcripts are prepared and then translated into English; that is, the entire analysis process is done in English. Second, only supported evidence and results are translated into English. This means that data analysis is done in the original language. In both strategies, a bilingual translator is suggested to be asked to do the translation task to ensure the reliability of the translation.

Regarding this study, the second technique was used. Arabic interviews were analysed in the original language. Still, the codes and categories were developed in English, and then the related quotations were translated into English to be presented in the final results report. To preserve the original meaning of the used quotes and the views of participants as accurately as possible, all Arabic quotations were translated by an approved translator who are knowledgeable about both languages to ensure the meaning's validity and translations' accuracy.

3.15. Cross-units of analysis

This process is a method in which research cases are compared and synthesised (Yin, 2009) to obtain a more sophisticated understanding of the whole case. This stage started once each unit of analysis was thoroughly analysed to compare all categories and patterns to look for similarities and differences among all units of analysis (Eisenhardt, 1989; Merriam, 1998). These comparisons can lead to new categories that the researcher does not anticipate. It also helps the researcher to capture any novel results which may be found in the data and thus provide a holistic insight into the whole case (Eisenhardt, 1989).

Several techniques are suggested in the literature to do this process (e.g. see Eisenhardt, 1989; Miles & Huberman, 1994; Yin, 2009). This study used a tactic of selecting categories or aspects and looking for "within-group similarities and intergroup differences". However, the researcher did not seek similarities and differences within only units of analysis but also with other different sources of evidence (e.g. documents, medical academics and librarians' interviews). To do so, the researcher designed a set of diagrammatic figures (see sections 9.2, 9.3, 9.4 in the cross-units analysis chapter 9) that represented specific aspects: conceptions of IL, characteristics of information literate medical students and ILE associated with the research questions. These graphical presentations of all units of analysis plus other data sources enabled the researcher to quickly identify the differences and similarities by assigning unique codes to each specific group of participants.

3.16. Ethical considerations

It is important to be respectful to participants because they should be treated well. As Merriam (2009) states, the issues of research validity and reliability are primarily based on the researcher's ethics. Therefore, attention must be paid to ethical concerns, particularly in the data collection stage and finding dissemination in qualitative study. These concerns result from the relationship between the researcher and participants. They are related to the extent to which the researcher can uncover their study purposes to the participants, the actual use of the consent form and the level of privacy and protection that can be granted to the participants to protect them from harm (Merriam, 2009). As mentioned above, interviews and focus group discussions were used as the primary instruments for data collection in this study, and these required physical and cognitive access to the participants. Before commencing the actual research, formal approval was required. So, after two ethics applications were applied, two ethical approvals were gained from both the University of Sheffield and The FOM at KU (see appendix 10, p. 348) to ensure that high-quality and ethical criteria were met during this study. All interviews and focus group discussion were conducted voluntarily and the research participants did not feel obliged to participate. Furthermore, to ensure the participants' convenience, the researcher tried to conduct the interview based on the participants' preferences, at a time that was most convenient to them and it was no more than 60 minutes to avoid taking up their valuable time unless they showed their willingness to take part for more than the specified time.

3.16.1. Informed consent

Informed consent is an ethical and legal prerequisite for the involvement of human participants in any type of research. Its importance is to enable the participants to make a voluntary decision in order to confirm their willingness to take part in a particular research through providing sufficient information in a language that is easily comprehended (Nijhawan et al., 2013). Participants must be given the consent form to inform them of their rights and commitments, the scope of the research, and the potential risks raised through their involvement in the study (The University of Sheffield, 2020). This form should be handed to the participants voluntarily without pressure from the researcher. It should also inform them about their right to withdraw from the interview at any point and the confidentiality and anonymity of their personal data (The University of Sheffield, 2020). For this study, an information sheet and consent form were sent by email in case of online interview or handed to the participants in case of face-to-face meetings to make them fully acquainted with the study's aims and objectives (see Appendix 11, p. 369). They were asked to read and sign the

consent form and then return it to the researcher. In this way, the researcher could use the participants' quotes and responses during the data analysis and the result dissemination when writing a case study report.

3.16.2. Protecting privacy

To maintain privacy, all collected data and documents were stored on a hard drive at the Sheffield University website and protected with a secure password. Only the researcher and his supervisors had the right to access the data. The confidentiality issues were also addressed in this research. The participants were informed that their personal information, such as their names or indefinable data, was anonymised. After the transcription, the researcher replaced and anonymised their personal information using alphabetical and numerical codes. The researcher labelled the transcripts and gave them a unique identity by choosing the first letter(s) of the units of analysis and sources followed by a sequential number to indicate the participants and to make sure anonymity and confidentiality, for example, P (I, II & III)= the first, second & third phase, MS= medical student, MA= medical academic and Lib= librarian.

Research Data Management (RDM) involves handling, organising and structuring research data during the research project. RDM is a crucial element in maintaining the integrity of data, protecting it from loss and damage, and providing others with the right to access it at the appropriate time (CESSDA, 2020). Therefore, researchers are required to develop their own Data Management Plan (DMP) to meet the affiliated institution's research and innovations policy (see The University of Sheffield, n.d.-b) and the research ethical requirements (CESSDA, 2020). DMP is "a document that describes how you will treat your data during a project and what happens with the data after the project ends" (Michener, 2015, p. 1). Hence, the researcher has developed a data management plan (DMP) as part of an ethical responsibility and as a framework to ensure the integrity of the research data throughout the research process.

Additionally, folders and subfolders were created to comprise a set of interview transcripts, documents, digital audio records and diagrams. These folders and files were organised and sorted systematically to ensure they were easily accessible and retrievable. In addition, the researcher followed a three-step-storing plan to avoid lost and damaged possibilities for the encrypted data. He stored the data in his computer and the university Google account, and the data were backed up each week throughout the project life-cycle, stored in an external hard disk.

3.17. Research quality

Research quality is the standards that are concerned with generating valid and reliable knowledge in an ethical manner (Merriam, 2009). Ethically producing valid and reliable knowledge is concerned with all types of research (Merriam, 2009). Some qualitative research uses positivist standards such as validity, objectivity, reliability, and internal and external validity to judge the quality and trustworthiness of qualitative research (Oates, 2006). Merriam (2009) argued that the criteria for assessing interpretive studies' rigour and reliability should differ from those of quantitative analysis. Although different measures are required to judge interpretive research quality, there is still a need for more consensus among qualitative researchers. Thus, they have yet to arrive at a certain point of agreement (Oates, 2006). However, they have established strategies to ensure the authenticity and trustworthiness of social research based on a paradigm considerably identical to interpretive philosophical assumptions (Merriam, 2009). Lincoln and Guba (1985), for instance, proposed a set of standards: confirmability, dependability, credibility and transferability for qualitative research as a substitute for those standards mentioned earlier used in positivist research. As discussed, there are different criteria for interpretivist and positivist studies, and as this study is interpretivist, the following criteria are used.

3.17.1. Credibility

It is concerned with the question of to what extent findings are accurate, match reality and measure it correctly (Merriam, 2009). This is related to interpretivist philosophical assumptions that there is no objective truth or single reality, but the fact in social science is holistic, consistently dynamic and multidimensional (Merriam, 2009). Oates (2006, p.249) indicates that "there is no ultimate benchmark against which to test any findings"; therefore, several strategies have been proposed for qualitative researchers to use to increase the credibility of findings (Merriam, 2009). One of these methods is triangulation. There are four types of triangulation: using multiple methods, multiple data sources, various investigators or multiple theories to assert identified findings. This study's credibility was enhanced by collecting data from various sources (people with different perspectives): medical academics, students and librarians. Then, their views were checked against what was observed in the collected documents as a supportive data collection method to provide a holistic understanding of the phenomena of interest. Another technique is called peer examination or peer review. About this study's findings: codes, patterns, categories and themes were extensively reviewed by two highly qualified supervisors over a long period, and they matched all codes and themes against the relevant quotations.

3.17.2. Dependability

In the social world, it means the possibility of repeating the research in different situations and getting similar results (Merriam, 2009). According to Merriam (2009), this benchmark in social sciences is a daunting task for qualitative researchers. It can never occur due to the nature of dynamic human behaviour and to the assumption that social reality is not objective and single. Merriam argued that checking to what extent the results are consistent with the data collected is more important than study replication in qualitative research because the same data can be interpreted differently. Therefore, Lincoln and Guba (1985) refer to it as dependability or consistency instead of reliability. They suggested several strategies to ensure the dependability or consistency of qualitative research, including triangulation, peer examination and the audit trail. The first two methods have already been discussed in the above section, so the focus here will be only on the third one. An audit trail in a qualitative study describes how data were gathered, categories were identified, and decisions were made within the research. The best example of an audit trail in the thesis can be found in the methodology chapter with detailed appendices (Merriam, 2009). The researcher of this study documented all the procedures, including ethical approvals, data collection, transcription, translation, analysis process, reporting findings, interview records, interview and focus group protocols, consent forms, information sheets, memos during analysis and all related documents to allow the reader to authenticate the findings by tracing this trail.

3.17.3. Transferability

It is concerned with the degree to which findings can be generalised to different situations, people and times (Merriam, 2009). One of the flaws attributed to knowledge produced by case studies is that it is only related to the case under investigation (Oates, 2006). However, Oates further argued that some case study factors are usually typical to other cases and thus, transferability can be made. Lincoln and Guba (1985) suggest the strategy of rich and thick descriptions to enhance the transferability of qualitative results to different contexts. This can be done by describing several research elements in detail, including setting, participants, and findings supported with adequate evidence from quotes from interviews, field notes and documents (Merriam, 2009). For this research, the researcher provided a thick description of all these elements. He also stored all interviews and focused group data such as transcripts, audio records and translations. The other research parts were detailed in different sections like methodology and result chapters. Giving such sufficient detail allows the readers and users of the research to decide whether the study's findings can apply to their particular situations (Merriam, 2009; Oates, 2006).

Walsham (1995), cited in (Oates, 2006, p.145), indicates that case study research can produce four generalisations: concepts, theory, implications and rich insight or a mixture of these. New concepts of IL in medicine have emerged from the analysis for this research. They are compared with the existing literature to ensure their validity. Also, this study aims to develop a theoretical framework represented via a diagrammatic model. It describes a set of skills, attitudes and knowledge for medical students of the FOM at KU, which can be transferred to be used in similar situations.

3.17.4 Confirmability

Confirmability is related to how the researcher can show his/her research actions in good faith. That is, it should be clear that the researcher's personal values and theoretical inclinations have been allowed to influence the research undertaking and the findings emerged from it (Bryman, 2008). Although complete objectivity is not possible in qualitative research (Bryman, 2008), Lincoln and Guba (1985) propose the audit trail as one of the techniques to enhance the level of confirmability. As mentioned above in the section of dependability, all activities and procedures in terms of data collection and analysis were documented in this research in order to maintain confirmability.

3.18. Summary

A qualitative case study approach with embedded units of analysis design was adopted to develop an IL model for the FOM at KU. Data were collected using a wide range of tools, namely semi-structured interviews, a focus group discussion, and relevant documents. The data were purposively collected from 55 participants, including medical academics (18), librarians (6), and undergraduate students (31). They were analysed thematically using both inductive and deductive (SCONUL model) approaches with the help of MAXQDA software. Two ethical approvals (from The University of Sheffield & the FOM at KU) were obtained to get access to the case site. The research quality was maintained through using a number of methods: triangulation, an audit trail, thick description.

Chapter 4 Case Study Report: Case Context and Phase (I) Medical Students

4.1. Introduction

The findings from phase (I) medical students (introductory phase) are presented in this chapter. It begins with introducing the research context and background, including information about KU and FOM. This information describes the research's setting and the nature of the services and facilities the FOM provides medical students. The conceptions of IL are presented, the characteristics of IL students identified by the participants, and their perceptions of ILE are noted.

4.2. The context of the research

4.2.1. Kuwait University

KU was established in 1966 with four faculties: Art, Education, Science and a College of Women, with a small number of students (418) and academic staff (31). It is the only state public research institution in the Kuwaiti higher education sector. Since then, other faculties have been founded, and the total number has reached 17, where the Faculty of Medicine is one of them. Today, KU offers a wide range of programmes in various academic and scholarly areas. It provides undergraduate students with 76 programmes and postgraduate students with 71 programmes. Thus, the number of students and academic staff has also increased, with approximately 1565 academic staff, 40000 undergraduates and 2500 postgraduates (Kuwait University, 2020).

KU aims to achieve its overall vision that realises Kuwaiti society's developmental needs by providing a world-class education that can advance, preserve and disseminate knowledge and prepare qualified healthcare professionals. (Kuwait University, 2020). The following section presents a background of the case site where the research was conducted with a detailed account of each sub-unit of analysis, which is the main focus of this research.

4.2.2. The faculty of medicine

The Faculty of Medicine (FOM) was established in 1973 to produce high-quality healthcare professionals who can play a vital role in developing the healthcare system in Kuwait to serve people (Faculty of Medicine, 2022). FOM provides its academic staff and students with 150 labs and research facilities to fulfil its mission. Its building has many teaching facilities (Faculty of Medicine, 2022, p.19). All the research and teaching facilities available to academics and students are comparable to most established institutions worldwide.

The mission of FOM is to “blend scholarship and service, follow a path of life-long learning through training in research and academic development, and share such learning with all those who come in contact, including the community,” and one of its objectives is “the pursuit of knowledge, education, training, and clinical skills in the field of Medicine” (Faculty of Medicine, 2022, p.23) which go hand-in-hand with the essence of IL principles. In order to accomplish such mission and objectives, FOM adopted educational strategies in which medical students should have developed attitudes in relation to the medical practice including both scientific and humanitarian; possess adequate basic science knowledge of human body; have learned how to elicit facts from a patient through the use of practical communication skills in order to deal with the patients and their relatives with sympathy and understanding; know that any conclusions should be reached by logical deduction and be able to assess evidence both as to its reliability and to its relevance; recognize that continuing education is an essential prerequisite for the practice of high-quality medicine and that he/she should remain a student and contribute to the progress of medicine throughout his/her professional career; and endeavour to remain abreast of the advancing frontiers of medical sciences globally and to apply these progressively in medical education, research, and services in Kuwait (Faculty of Medicine, 2022, p. 24).

Since 2006, FOM has introduced new teaching strategies into its curriculum. Approaches such as PBL, EBM and small group teaching have been integrated into the curriculum. It is divided into three phases (e.g. Phase I, Phase II and Phase III), representing the units of analysis of this research. Each phase has unique characteristics and qualities that distinguish it from the others.

4.3. Unit of analysis report

4.3.1. Phase (I) medical students: case context

Phase (I) consists of the programme's first two semesters (year 1). It includes the following courses: English language, Biology, Biophysics, Biostatistics and basic Epidemiology, Chemistry, Introduction to Medicine Computers (IMC), and Social Sciences. Since 2015, students have been directly enrolled in FOM. The curriculum of the first phase comprises three main components: the general university requirements, the English language courses, and the science courses. The first component aims to provide students with a broad educational background and raise their awareness of their society, religion and heritage. The second component is intended to help them develop the communication skills necessary for the pre-clinical and clinical phases. The third one is designed to equip them with a basis for science essential to proceed with the pre and clinical programs.

In the first year, students are given a set of courses with much focus on English language programmes where there are two courses (English 181 & 182) during the first and second semesters with five credits for each. This programme aims to provide the students with the necessary language and study skills to complete their academic and professional studies. Students are taught to develop many English language and communication skills. They also develop educational and medical vocabulary through reading. Some information cognitive skills, including sequencing and making judgments about information, are integrated into the writing programme.

In the first semester of the first year, students are given the "Introduction to Computer in Medicine " course, categorised as a general university requirement with only one credit. This course aims to develop several technological skills, including managing information on the computer using files and folders, using applications like word processing and PowerPoint, accessing the WWW for professional purposes, using email to communicate and selecting and using e-resources and medical databases.

During the first year, FOM offers many courses such as chemistry for health science, biophysics, biostatistics and basic epidemiology as science courses as well as elective courses. The dominant assessment formats in the first phase are Multiple Choice Questions (MCQs), marked by a Scantron machine (Faculty of Medicine, 2022).

4.4. Information literacy conception

From the analysis of transcripts, phase (I) medical students defined IL in the medical field from two perspectives as either: (1) core competencies in which IL is seen as a way of searching in databases, understanding and interpreting information found and gathering and organising information to achieve academic tasks; or (2) using technology in medicine in which IL is perceived as to how to make use of telemedicine applications in the health care context as shown in figure 4.1. The results are discussed in more detail in the following subsections.

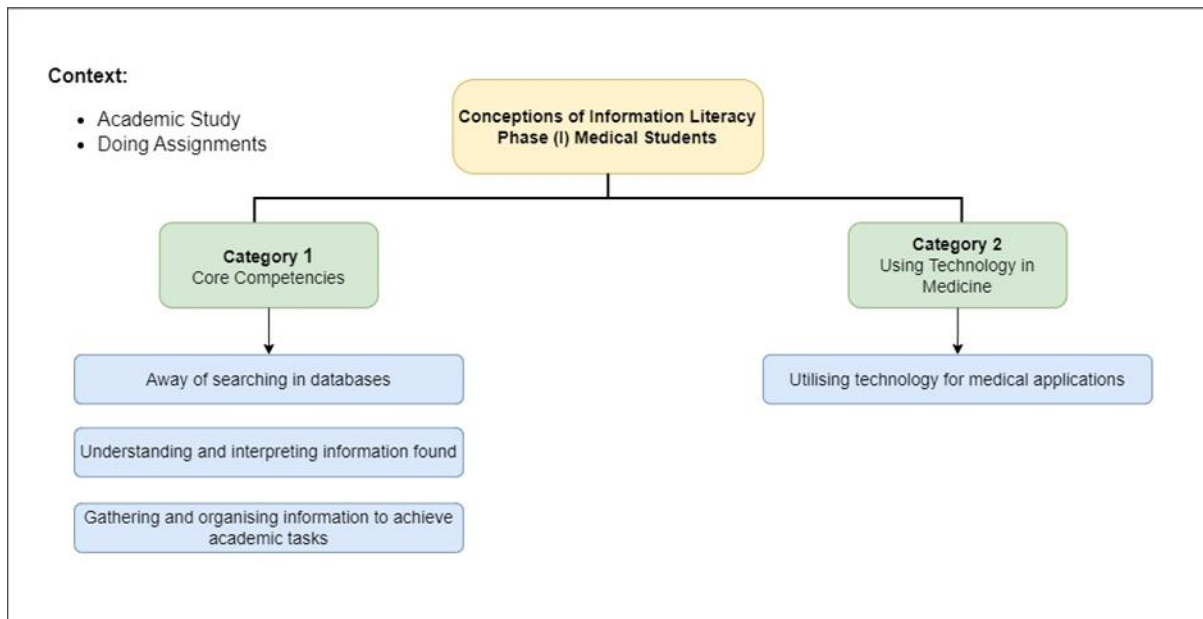


Figure 4-1 Conceptions of information literacy: Phase (I) Medical Students

4.4.1. Category (1): core competencies

- *A way of searching in databases*

IL was described from a narrow perspective on developing the appropriate search strategies for information in complex medical databases. One interviewee stated that:

“When I hear the term information literacy, only search skills or the ability to correctly search databases comes to mind” (P1MS1)

From this perspective, many core skills and cognitive abilities subsumed under the broad concept of IL are neglected as the same participant realised that:

“I mean, when one asks whether I possess information literacy, the first thing that comes to mind is whether I can conduct online searches. So, instead of the broader concept of the term, the only thing that comes to mind is possessing limited online search skills so that you can search for information correctly, but not the other skills, such as information evaluation, analysis and presentation skills” (P1MS1)

- *Understanding and interpreting information found*

IL was conceptualised from a slightly wide angle of how to easily access information sources and understand them when utilised and presented. For example, one participant explained that:

“Based on my experience, it may be defined as the ability to find the information I need for my research, use it, and easily access it when needed. However, I should be able to do more than use the information, but to communicate to others that I have a full understanding of such information” (P1MS7)

Interviewer: What do you mean by “to communicate it”?

“I mean that when I do a research piece, I not only need to simply present the information I got by PowerPoint, but I have to be able to explain and

communicate the content of such information to other people in such a way as to show that I thoroughly understood and not just found the information” (P1MS7)

- *Gathering and organising information to achieve academic tasks*

The transcripts also revealed that phase (I) medical students spoke more generally about the role of IL in their education and how it allows them to provide a valuable platform for their future reference in medical education:

“The way I see it is that every medical student needs to be able to collect relevant information that he can build upon in coming years, but such information should be properly organised and not scattered haphazardly. I mean, medical students should learn not to study each subject separately but should instead find linkages between various subjects, such as biostatistics epidemiology and chemistry on the one hand and physiology on the other, so that all such information becomes the basis for understanding the medical subjects” (P1MS3)

4.4.2. Category (2): using technology in medicine

- *Utilising technology for medical applications*

Only one participant from phase (I) defined IL from technological aspects to optimally use specialised applications in promoting health care services. P1MS4 participant stated that:

“I think it is an important concept because nowadays, information [is] on computers and phones, and every doctor needs to know [...] how to use and get the patient's information from the computer because I see doctors using the computers at work.”

4.5. The characteristics of information literate students in the medical field

Phase (I) medical students identify attributes they perceive as an essential ingredient of information literate students. Figure 4.2. presents these attributes derived from phase (I) medical students’ semi-structured interview transcripts. It also outlines the relationships and the associations that exist among them.

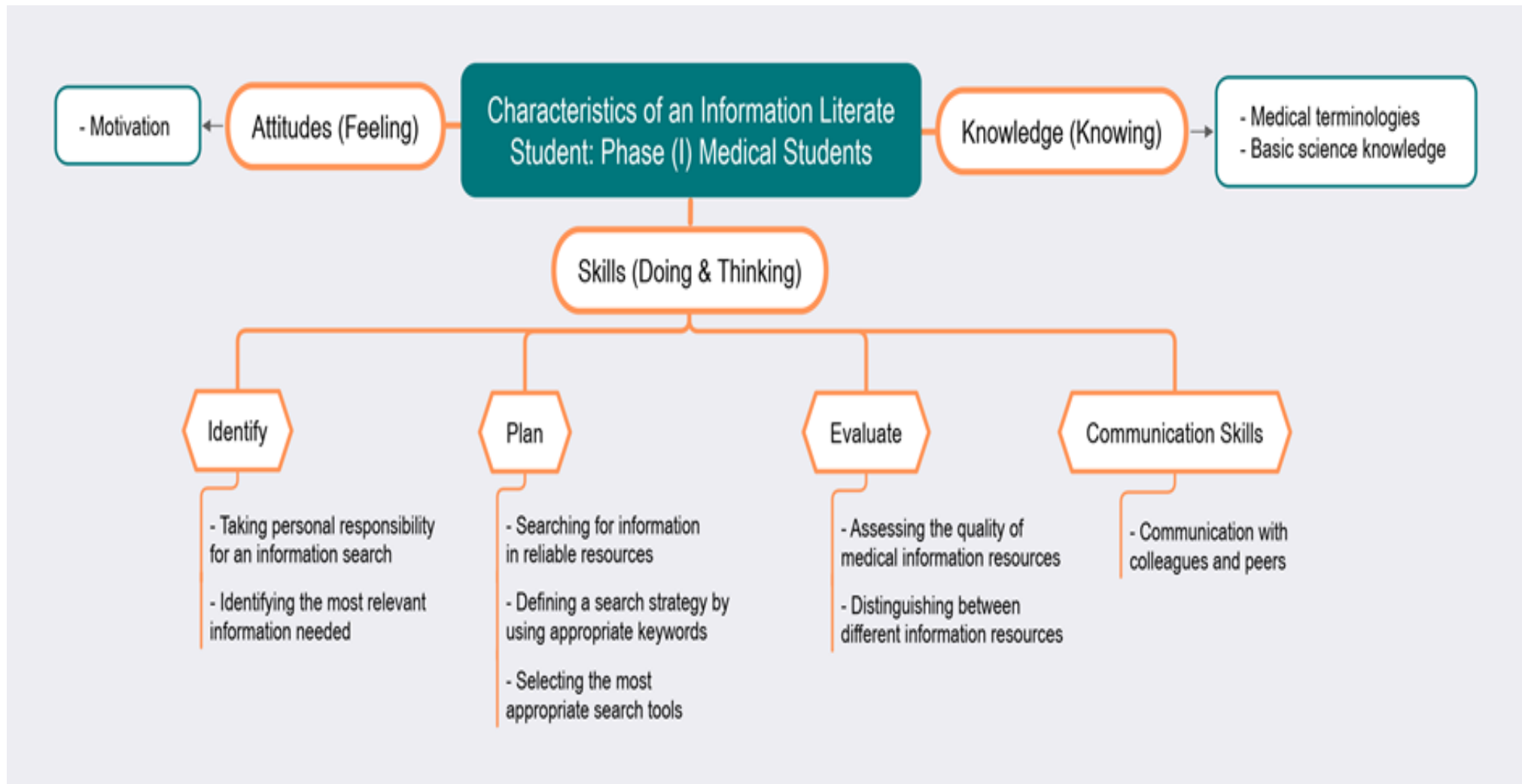


Figure 4-2 Characteristics of an Information Literate Student: Phase (I) Medical Students

Despite the lack of experience as newcomers to the Faculty of Medicine, phase (I) medical students, to some extent, draw a clear picture of what medical students need to acquire in terms of knowledge and information skills reinforced by motivation as a significant attitude to become information literate in the setting of medicine. The necessary knowledge which needs to be developed includes:

- Mastering medical terminologies
- Basic science knowledge

Several abilities and skills that phase (I) medical students believe that they need to develop.

These comprise:

- Identify the information needed (Identify)
- Construct strategies for locating information and data (Plan)
- Evaluate information and data (Evaluate)
- Communicate with colleagues and other academic staff (Communication skills)

They also consider certain attitudes as significant attributes for an information-literate student in the medical field. These involve:

- Motivation (wanting to learn)

As evidenced, phase I medical students perceive that becoming information literate should involve knowledge and skills supported by valuable attitudes. However, these attributes are strongly related and thus cannot operate as separate components in a given situation. The following subsections describe in detail each of these components as follows.

4.5.1. Knowledge

It is outlined in two main aspects: mastering medical terminologies and basic science knowledge as follows.

4.5.1.1. Mastering medical terminologies

Understanding medical terminologies makes a difference in learning medical courses. Therefore, it is stated that Latin terms knowledge is recognised as a significant element phase (I) medical students must acquire to be information literate within a medical context.

“I also found the English language course and specifically the medical terminology segment very helpful. The study of Latin terms also helped me a lot, particularly in the biology course” (P1MS3)

4.5.1.2. Basic science knowledge

When asked about any particular skills or knowledge required by medical students to be information literate, it is explicitly identified that having basic science knowledge (e.g. biochemistry, biology, physics) is considered part of information literate attributes. Gaining

such knowledge is also seen as a critical component in searching for information and learning. For example,

“Yes, we need to know much about science modules like biochemistry, biology, and biophysics, so I guess I need to learn more about these sciences in medicine and help us to search for information” (P1MS4)

4.5.2. Skills

Phase (I) medical students identified skills and abilities: identify, plan, evaluate and communication skills presented in the following subsections.

4.5.2.1. Identify

The participants showed their need for developing capacities of information identification within the context of medical faculty. For instance, one informant discusses the importance of identifying the required information skills from the perspective of the challenge facing most phase (I) medical students when searching for the needed information.

“Frankly, I think that information identification skills are the key skills that first-year medical students must acquire. Based upon my personal experience, however, first-year medical students experience difficulty in developing the skill of accurately identifying information as reflected by the ever-recurring questions of “What is the required information?” and “Where can I look for it?” (P1MS1)

Taking personal responsibility for an information search

At the end of the phase (I), students clearly articulate that they should not restrict themselves to limited information sources such as handouts and lecture notes or slides. However, they recognise from their experience as phase (I) medical students that they need to determine the parameter of their information need and thus take personal responsibility to search for further information which has a positive impact on their academic attainment:

“To be truthful, I did not do much research even when I was a first-year medical student and was dependent upon lecture notes until I noticed that my grades were markedly inferior to those of students who were not dependent upon lecture notes handed out by professors and having had diversified their sources of information” (P1MS5)

Identifying the most relevant information needed

Due to the massive curriculum and massive volume of information in the medical field, students need to put much effort into taking an approach that enables them to identify the most relevant information in their topics. As one interviewee said:

“I also believe that, as a result of the huge amount of available information, medical students need to focus on and identify the most important information” (P1MS3)

Followed by the ability to identify the most relevant information needed, it is also recognised that phase (I) medical students, to be information literate in medicine, demand to adopt and develop learning habits so new information is being actively sought all the time.

“I suppose that as a high school student, you relied wholly upon memorisation and rote learning where all the required information is handed to us by the instructors, while as a university student, you have to focus more on identifying the information needed by ourselves. Therefore, medical students need to master the skills of looking for information because it is not going to be handed to them on a silver platter, and they have to exert double the effort to access the required information” (P1MS3)

4.5.2.2. Plan

In general, phase (I) medical students demonstrate an awareness of constructing strategies for locating the needed information. This seems to be apparent through the following capabilities.

Searching for information in reliable resources

Locating and seeking information in reliable resources like complex medical databases is recognised as one of the essential skills phase (I) medical students need to develop. Due to the lack of prior experience in searching for such tools, one interviewee placed much emphasis on developing such abilities by stating that:

“The most significant skill, in my opinion, is the ability to search for information in approved sources and websites. I initially lacked this skill, which is because I had never used this thing before I became a university student” (P1MS5)

Selecting the most appropriate search tools

A great awareness is raised during the discussion of doing coursework and assignments, particularly in choosing the most suitable search tools that can meet their information needs. This ability is a significant part that medical students need to develop in a context with a wide range of information sources and tools. One informant reported that:

“Yes, only Scopus. I did not search, for example, in PubMed because it only had purely medical articles, and the ketogenic diet is not a purely medical topic. On the other hand, Scopus is a database with a general science orientation and is more likely to contain articles about this type of diet. I also used Google Scholar” (P1MS1)

Defining a search strategy by using appropriate keywords

In the same context of conducting coursework debate, some medical students highlight the importance of using the appropriate keywords and concepts while defining and constructing search strategies for locating the needed information:

“The second question was about the advantages and disadvantages of a ketogenic diet. So, instead of typing, what are the advantages of Keto diet? I

only typed keywords to broaden the search and get more than one article to choose among” (P1MS4)

Furthermore, another interviewee said:

“I tried to look for the required information using the keywords as much as possible. Instead of typing the whole question and trying to find answers, I only typed certain points in the search engine. For example, instead of "What is the history of Keto, I only typed keywords like Keto history, and then I would read the results to determine the most relevant answers” (P1MS7)

4.5.2.3. Evaluate

Assessing the quality of medical information resources

The analysis revealed that phase (I) medical students are aware of the significance of acquiring and developing information evaluation skills within the setting of medical education. They identify these skills as their ability to assess the credibility, reliability, accuracy and validity of obtaining medical information, particularly those available on public electronic websites. As one interviewee put it:

“I think the ability to extract information from reliable sources, because, for example, I didn't care much about the source in high school or previous years. But now doctors need reliable sources of information. I need to assess the website before using it. This is a skill that's very important for doctors” (P1MS4)

Specific evaluation criteria are used and applied by medical students to ensure the quality of medical information obtained.

“When we first hear how to assess the website, we know it's reliable. When it needs that certain checklist [CARS], it's credible and reliable, and the information is not biased. We would know from the website if there is a lot of advertisement, that means that it's not reliable. Less advertisement means it's more reliable, so we can rely on it to get information” (P1MS4)

Distinguishing between different information resources

The participants described it as the ability to evaluate the value of information sources based on their relevance and importance to select the most appropriate sources for specific purposes.

It was reported that:

“I think the skill that is most needed is the ability to sort studies and research papers according to their respective importance to determine the information of most relevance. So, you have to develop the skills of evaluating articles and studies” (P1MS3)

4.5.2.4. Communication skills

This ability seems to be depicted from a narrow perspective by phase (I) medical students. Being information literate is seen as those who can build good rapport with other colleagues

and ask family members, especially those with clinical and medical experience. For example, communication skills were described as:

“I feel that the best way is for them to ask the course instructors, senior medical students or even relatives working in the medical field. Of course, they can also read medical textbooks” (P1MS6)

4.5.3. Attitudes

4.5.3.1. *motivation*

Attitudes and behaviours are reduced just to an intrinsic motivation by Phase (I) medical students. This phrase is described as having a willingness to learn, being an active learner and demonstrating great enthusiasm for learning from educators. One participant explained how information-literate students in the medical field are supposed to be:

“Well, I like to see them [medical students] with a strong desire to learn and be open-minded to the medical advancements during the first year so that we understand it and learn from teachers” (P1MS4)

4.6. Information literacy education

This section provides an overview of the ILE position from the angle of phase (I) medical students, as shown in Figure 4.3.

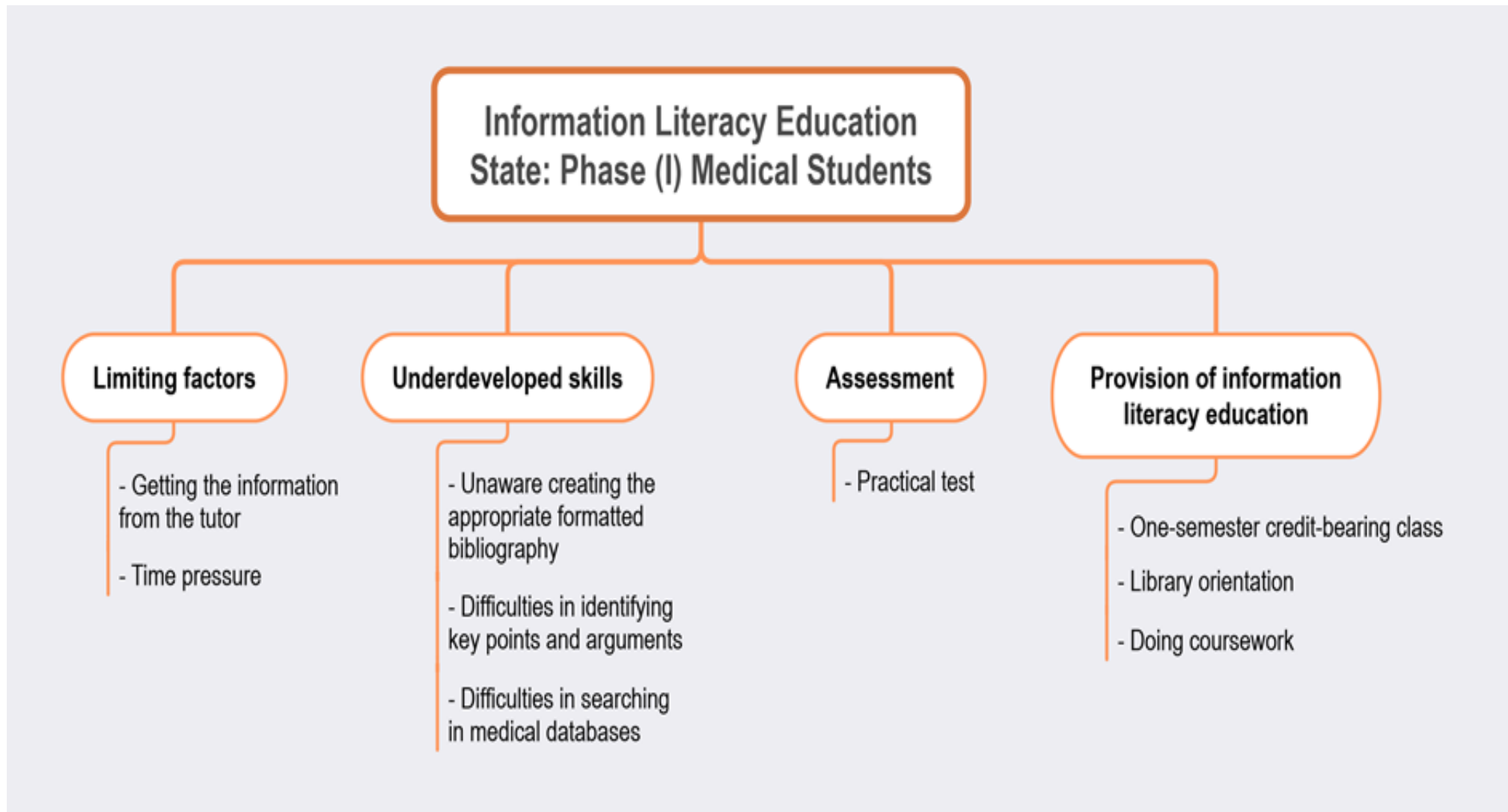


Figure 4-3 Information Literacy Education: Phase (I) Medical Students

4.6.1. Provision of ILE in the first phase

The analysis of the transcripts shows that phase (I) medical students are exposed to ILE as soon as they arrive at the faculty. The discussion also reveals that they are taught core IL skills through several opportunities comprising IMC courses as one-semester credit-bearing classes, library orientation sessions given to them in the first semester of the first year, and doing coursework for elective courses.

One-semester credit-bearing class

Almost all the interviewed participants assert that they have been taught a range of IL skills through the IMC module delivered by the Community Medicine Department. These skills include Boolean searching, assessing medical websites using specific evaluation criteria, formulating paper abstracts and searching in famous medical source tools like PubMed and search engines like Google. These competencies are taught through practical sessions in computer labs. For example, P1MS5 articulates the content of the course and its significance, saying:

“I believe we have received IL instructions in the computer course, which was mainly about collecting information. During the practical segment of the course, we received training on how to use websites like PubMed and also on how to evaluate and ensure the credibility and reliability of websites through the application of certain standards known as CARS (Credibility, Accuracy, Reasonableness, and Support) Checklists. The sessions were helpful” (P1MS5)

Library orientation

Students also recognised that they are exposed to ILE through library orientation sessions administered by the library. These include searching for the availability and location of items in the library using the library online catalogue and off-campus access to library resources through installing VPN networks and obtaining a password and username:

“The library only addressed the practical aspect of online search of databases, using the AND-OR-NOT strategy, which enables you to do things and learn how to look for a particular book and know on what shelf it can be found without having to go all the way to the university library. We also learned that we have access to most databases through the library website” (P1MS1)

Doing coursework

The analysis found that following the essential requirements of conducting coursework is an effective way of learning IL skills during phase (I). These include avoiding plagiarism by using their own words, adding reference lists, collecting information from reliable sources and gathering information from different sources. Thus, students recognised that doing such coursework was one of the applications of IL in phase (I).

“We were only given an assignment in one elective course...where we were specifically required to use approved and authenticated sources” (P1MS1)

“I also had to read several related articles and not just one to get the relevant information and finally included it in the research project after rephrasing” (P1MS3)

“I used PubMed to search for the required information...the information had to be reliable with proper citations and references” (P1MS2)

4.6.2. Assessment

Practical test

The transcripts supported by evidence that emerged from document analysis revealed that IL learning outcomes were assessed only by one assessment method as a summative tool taking the format of a practical exam set by academics from the Community Medicine Department (CMD) within the IMC module in the first semester of phase (I). It is set to check students' understanding of various IL skills (e.g. evaluating medical websites, applying specific checklists, and writing a summary of a research paper):

“Only one practical test was administered, in which you are given the title of a given article, and you are required to extract the related bibliographic information, such as the author's name and the date of publication, by conducting an online search of databases. We were also required to write an abstract on a given study. The practical test also included how you can determine whether or not a given website is reliable by applying the evaluation criteria we discussed earlier. We were also required to extract all studies conducted by a particular author” (P1MS7)

4.6.3. Underdeveloped skills

Students perceive several deficiencies they face during the discussion of conducting their coursework for the elective subject. Identifying these deficiencies enables identifying the core skills students need to improve. They are presented as follows.

Unaware of creating the appropriate formatted bibliography

Students identified this as a significant problem affecting their academic attainment and marks. Lack of knowledge on creating suitable bibliographic reference lists and choosing the proper citation style is problematic for students, particularly within the context of doing coursework during phase (I). This is because such skills and knowledge are strongly associated with their academic tasks:

“Well. I was required to list references in a particular way, but to be truthful, I did not know at the time how to do it and what system to follow, so I used the website “cite me”, where I only had to enter the title of the article and the required referencing style, whether APA or another style, for it to be

automatically referenced by the website, but I then discovered that it was not done in the academically correct way which caused me to lose grades” (P1MS1)

Difficulties in identifying key points and arguments

Identifying the most relevant information needed in specific information resources is a significant obstacle students face in meeting their academic requirements. One interviewee describes the challenge they encounters when doing her academic coursework, stating that:

“When we were given a certain topic, we didn’t know where to search, and even when we found a relevant article, we didn’t know what information is important and what is not” (P1MS2)

Difficulties in searching medical databases

Phase (I) medical students could reflect on their search abilities to recognise that they encountered difficulties while searching in medical databases to accomplish their academic tasks.

“Even though we did that assignment as a work team, we did face some difficulty in searching for the required information in medical databases, particularly since we were required to use accredited sources of information and not just regular search engines” (P1MS7)

4.6.4. Limiting Factors

The discussion implicitly reveals several latent factors affecting phase (I) medical students’ IL development within the context of FOM. These are discussed in the following sections.

Getting the information from the tutor

All the interviewed participants highlight a critical issue that may significantly impact the development of IL. In most teaching approaches in FOM, students are given all the information they need in the form of lecture notes and handouts, which may hinder students’ willingness to seek further information to achieve their academic tasks:

“I relied upon lecture notes handed to us by course instructors during lectures, which constituted our primary source of information as first-year medical students in preparation for exams. However, we did not look for extracurricular information to complement existing information for any course. As to the courses themselves, we didn’t have any use for the textbooks. I mean, we got the needed information either orally through course instructors or through PowerPoint slides” (P1MS4)

Time pressure

Phase (I) medical students consider the time pressure to impact them significantly, even though they are just given introductory subjects compared to the third phase students. Only one informant reported her feelings during the first year about time constraints:

“You don’t have to expend additional time and effort in reading textbooks”
(P1MS1)

4.7. Summary

The analysis revealed that phase (I) medical students have defined IL in two categories: (1) as a core competence needed to fulfil their academic tasks and (2) from quite a narrow perspective associated with using technology in medicine. They have also described information-literate students as those who should possess three main components: knowledge, skills and attitudes. During phase (I), medical students learn IL through fewer opportunities comprising one-credit bearing class, library orientation sessions, and doing coursework where some IL skills are necessary. During phase (I), IL learning outcomes are assessed only by one assessment method, a practical examination.

Chapter 5 Case Study Report: Phase (II) Medical Students

5.1. Introduction

This chapter presents the findings from the analysis of the interviews conducted with phase (II) medical students supported by evidence obtained from the analysis of documents. The structure of this chapter is as follows:

- The description of phase (II) as the case context.
- The three themes identified from the thematic analysis, including conceptions of IL,
- The characteristics of information-literate medical students and the state of ILE.

5.2. Unit of analysis report

5.3. Phase (II) medical students: case context

The Phase (II) period covers three years, from the second year to the fourth year. Upon successful completion, students are awarded the Bachelor of Medical Sciences (B.Med.SC.) degree that qualifies them to proceed to phase (III). The curriculum is designed to provide students with basic sciences and to incorporate principles based on students as the centre of the learning process, concentrating on the need for self-learning. Various teaching methods, such as Evidence-Based Learning EBL, Project-Based Learning PBL, small group teaching, self-learning, tutorials, lectures, didactic lectures, and laboratory exercises, are salient characteristics of this phase. The phase (II) curriculum consists of two blocks of foundation, including 30 weeks, ten system blocks and one elective course offered over six semesters. During the first semester of year 2, students receive a five-credit English course (English 183). Similar to the previous two English courses (181 & 182) in phase (I), this course aims to develop students' English language skills in four main areas: listening, speaking, reading and writing, but at a higher level. Students must also demonstrate communication skills through oral presentations and develop academic and science vocabulary through listening and reading authentic medical articles, lectures and discussions. The ultimate goals of the second phase curriculum tend to make behavioural changes within the following components: knowledge, skills, and attitudes. Attendance is mandatory for all lectures, tutorials, seminars, small group teachings, practical sessions, PBLs, clinical skill sessions, and hospital visits. MCQ is the format used in the assessments and final examinations (Faculty of Medicine, 2022, pp.50-65).

5.4. Information literacy conception

From the analysis of transcripts, phase (II) medical students defined IL in the medical field from two perspectives: (1) core competencies and (2) higher-order cognitive skills as shown in figure 5.1. However, it is worth noting that there is an overlap between the skills mentioned together in both categories. For example, skills like gathering information categorised as core competencies are explicitly mentioned in quotations that are analysed as higher-order cognitive skills belonging to category (2). These categories are discussed in the following subsections.

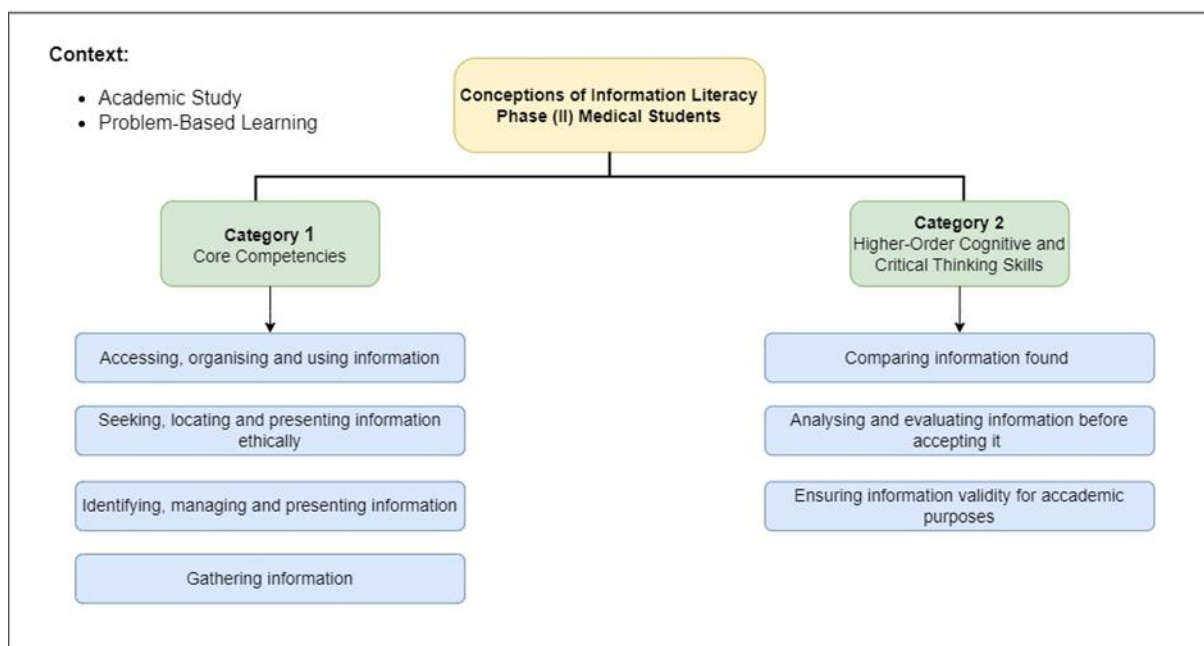


Figure 5-1 Conceptions of Information Literacy: Phase (II) Medical Students

5.4.1. Category (1): core competencies

Generally, phase (II) medical students describe IL around the core information skills, starting from identifying the needed information, the ability to access it, evaluating, using and presenting information ethically. For instance, it was stated that IL plays a significant part in medical education, where students need to be able to seek information and present it ethically.

“I think that modern medical education as a whole is based upon information literacy, which is defined as the ability to look for information and then present it ethically” (P2MS5)

Other participants reported that:

“Information literacy for me is to be able to clearly identify and properly use and present the relevant information and also being able to save such information for future reference. So, it is all about efficiency in identifying and processing information” (P2MS10)

“The student’s ability to access, arrange and use the information” (P2MS9)

5.4.2. Category (2): higher-order cognitive and critical thinking skills

A small number of those interviewed suggested that information-literate students in the medical field often need to employ critical thinking skills to evaluate medical information cautiously before accepting and presenting it.

“I think that a medical student must know how to get the required information and ensure its validity by comparing information obtained from multiple sources, organising it, and presenting it succinctly. However, getting the information may not be as important as identifying incorrect information through comparison. So, a medical student needs to filter obtained information and not just accept it as is without further scrutiny” (P2MS11)

Another informant said:

“I suppose a medical student will become efficient in getting the information from a reliable source, identifying its relevance, determining whether it is right or wrong and finally presenting the information in a scientifically acceptable manner. So, such a medical student will be information literate and as such will not likely make mistakes such as getting information without ensuring its validity, failing to use the information properly or failing to save such information for later reference” (P2MS8)

5.5. The characteristics of information literate students in the medical field

Phase (II) medical students identify three attributes: knowledge, skills and attitudes derived thematically by analysing the semi-structured interview transcripts. These attributes articulate how phase (II) medical students perceive an information-literate student in the medical field as illustrated in figure 5.2.

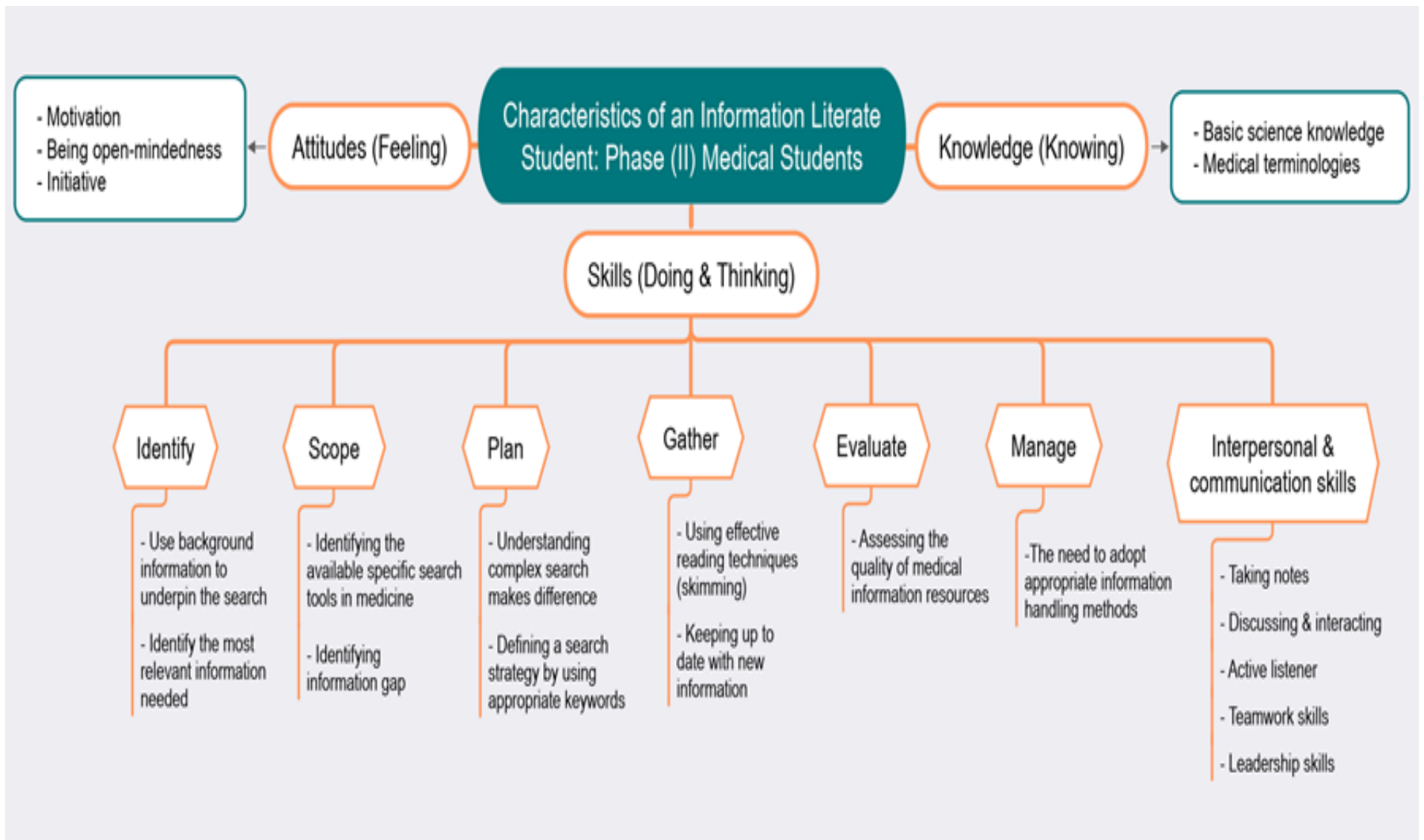


Figure 5-2 Characteristics of an Information Literate Student: Phase (II) Medical Students

Phase (II) medical students provide a clear picture that reflects the feature of being information literate who is able to operate effectively and efficiently within the preclinical setting. This picture of information literate comprises the following key components outlined in the above diagram.

Acquisition specific knowledge comprising:

- Basic science knowledge
- Medical terminologies

Developing a range of skills comprising:

- Identify the information needed (Identify)
- Assess the current knowledge and identify gaps (Scope)
- Construct strategies for locating information and data (Plan)
- Locate and access the information and data they need (Gather)
- Evaluate information and data (Evaluate)
- Organise information professionally and ethically (manage)
- Communicate with colleagues and other academic staff (Interpersonal & communication skills)

Considering certain attitudes comprising:

- Motivation
- Open-mindedness
- Initiative

The attributes of being information literate described by phase (II) medical students in the preclinical setting are outlined in more detail in the following subsections.

5.5.1. Knowledge

Phase (II) medical students mentioned gaining basic science knowledge and medical terminologies as a critical aspect of being information literate in the medical field. Science knowledge is acquired from two main perspectives, the same as those in the first phase, with much focus on basic science knowledge. These are discussed in the following sections.

5.5.1.1. *Basic science knowledge*

Gaining basic science knowledge is recognised as one of the essential elements for phase (II) medical students. It contributes to understanding the basic medical concepts that play vital roles either within the preclinical or clinical stage when practising the profession effectively and efficiently:

“Frankly speaking, the preclinical stage is all about understanding concepts and acquiring basic information in certain sciences, such as pathology, physiology, anatomy and biochemistry, which constitute the fundamental component of medicine, without which a medical student in the preclinical stage will find it difficult to practise the medical profession properly” (P2MS9)

In addition, they place much emphasis on having solid background knowledge in scientific subjects. Such knowledge is crucial to help them think critically when analysing any medical case. For example, one interviewee indicated the significance of subject knowledge:

“For me, consistency is key in acquiring basic science knowledge. I think that if you consistently study basic sciences, you will have the tools to analyse any case that comes your way because you have a solid knowledge of basic sciences base that will help you come up with the answer” (P2MS10)

5.5.1.2. Medical terminologies

Document analysis revealed that learning medical terminology and academic vocabulary in phase (II) seems to be an integral part of all exercises of the English course (module code 183), which constituted five credits and was delivered in the first semester of phase (II). This attribute forms a fundamental component of information-literate students in the preclinical phase.

5.5.2. Skills

Phase (II) medical students identify a wide range of skills as critical components of being information literate in the medical field. They are discussed in the following subsections.

5.5.2.1. Identify

Use background information to underpin the search

Participants described this attribute from the PBL context perspective as how to use background information to support the search process during the first session of the PBL. They take this approach through which the basic concepts are elicited, even from less reliable resources like Wikipedia. This process is considered as a crucial step to provide them with solid background information from which they can underpin the search and thus locate the potential resources from more reliable sources for the second session.

“The first session is a brainstorming session, so we don’t need specialised resources, just general information extracted from simple articles. I mean, Google and Wikipedia would be enough during the first session, but in the second session, you have to get your information from reliable sources” (P2MS8)

Identify the most relevant information needed

As mentioned previously, information is rapidly increasing in the medical field, so determining the most appropriate sources is regarded as a critical attribute of being information literate that phase (II) medical students need to focus on. As one interviewee put it:

“Naturally, any progress in the medical field is associated with an enormous body of information, and that is why I think that the skill I needed most, particularly in phase 2, was the ability to identify which information was important and which was just redundant” (P2MS5)

Another interviewee said:

“So, I feel that we need to focus more on the information that is relevant to the research topic, and not broaden the scope of search so much as to lose sight of the original topic” (P2MS10)

5.5.2.2. Scope

Identifying information gap

The transcript reveals that phase (II) medical students demonstrate the need for assessing their current knowledge, particularly when asked about information resources used during phase (II). They identify this as having the ability to recognise the need for information to fill any knowledge gap raised from the limited sources they depend on. Thus, they seek additional information resources to satisfy their information needs and bridge this divide. As one interviewee explained:

“In the preclinical stage, lecture notes handed out by the professor during the lecture constitute the basic source of information. If you need further information or feel that there is a gap that must be covered, you can consult the textbooks included in the bibliography provided by the professor at the end of the lecture” (P2MS5)

Identifying the available specific search tools in medicine

They highlight the importance of being acquainted with the various information tools available in the medical field and going beyond the confines of search engines like Google. They also mention the capability of identifying the features of each of these tools and the different information sources they have.

“I think we need to be more familiar with sources other than the ones that immediately come to mind, such as Google, just because it's out there. However, the situation is different, with the medical field being in a state of continuous evolution. Information reliability is at a premium, so you must go to websites such as PubMed, which can be accessed through the university network. There are also other websites which contain valuable information not available in other platforms, which we either can't access or haven't heard of because they're not used much” (P2MS7)

5.5.2.3. Plan

Understanding complex search makes a difference

The participants understand that identifying the most appropriate information resources demands constructing complex search strategies within a complicated medical information ecosystem. They also believe that such search strategies lead to locating satisfactory results and can make a difference in the breadth and depth of information found:

“There is a huge body of knowledge available in the medical field, and to find the required information or rather the information closely related to the research topic, one must possess certain skills. Otherwise, as in my case, one will experience considerable difficulty in even writing the question of the research. For example, if the research topic is about the aetiology of a particular type of cancer, the results of any internet search are not likely to be satisfactory in content or even abundant in terms of quantity if you write what causes cancer” (P2MS8)

Another interviewee said:

“The main thing is to identify what is relevant and access such information because, yeah, let's say your research assignment is about the central nervous system; you can't find the required information on medical websites by simply writing “central nervous system”. You have to narrow down the search field by using particular keywords to get relevant information” (P2MS6)

Defining a search strategy by using appropriate keywords

The analysis revealed that phase (II) medical students shed light on the importance of planning skills in determining suitable information sources, particularly within the environment of PBLs. Furthermore, they demonstrate an awareness of using the appropriate keywords to construct sophisticated search strategies, resulting in unexpected results in solving the problem.

“Generally, within the problem-based education environment, a medical student must be able to develop a research plan for any given problem to be tackled within PBL class. Through this plan, the medical student must identify the most significant keywords and determine, according to the problem, the useful sources of information. For example, in the pre-clinical year, where basic sciences such as anatomy and physiology are predominant, sources like textbooks are the most useful” (P2MS4)

5.5.2.4. Gather

Using effective reading techniques (skimming)

Even with constructing robust search strategies, the rate of overall results is often high, especially in a context overwhelmed by the massive volume of information from a wide range of resources. Therefore, phase (II) medical students identify skills such as skimming as a

critical ability they need to employ to locate the most appropriate information resources among many outcomes to achieve their academic tasks. One informant reported that:

“Frankly, among the most important skills is the ability to skim through all related studies to determine the sources you need to complete your research project. For example, if you search the PubMed database, the search results will be too many for you to work on, and that is why the skill of prioritising information based on relevance is a vital skill” (P2MS9)

Keeping up to date with new information

Analysis shows that phase (II) medical students are aware of being information literate during the preclinical context to access the literature and, as such, keep up to date with new medical information and the latest developments that exist only in primary sources.

“Medical students must be information literate to keep pace with the latest research works, which will be key to the proper practice of their profession. But, of course, not everything will be available in secondary and tertiary sources, while the latest medical information contained in primary sources can only be accessed if you possess those research skills, which will enable you as a medical practitioner to keep up-to-date and help you make the right medical decision” (P2MS4)

5.5.2.5. Evaluate

Assessing the quality of medical information resources

Phase (II) medical students restrict the ability to evaluate to just assessing the quality and credibility of information resources found before presenting them in the PBL classes. As one interviewee put it:

“The most significant skills involve the ability to determine whether or not a certain website is approved and reliable. Personally speaking, I was repeatedly cautioned by professors that I should always verify the validity of any information and the reliability of its sources before presentation, meaning that I must determine beforehand whether the information is right or wrong” (P2MS5)

5.5.2.6. Manage

The need to adopt appropriate information-handling methods

This ability is identified during the discussion of the types of information resources relied on through phase (II). Only one participant indicated the significance of developing or adopting an appropriate approach to organise and store the gathered information from multiple resources to be easily retrieved for future uses.

“The way I do it is like this: if I find the topic too extensive, I try to condense all the information in one document, either making a note on the book itself or otherwise making a separate note for future reference so that I can quickly get to it and refresh my memory. (P2MS10)

5.5.2.7. Interpersonal and communication skills

Most participants approach this attribute from the perspective of communication skills development in the academic context. As one participant put it:

“I think that a second phase medical student needs to develop skills such as communication skills, which are necessary for a proper discussion of any problem, particularly in PBL classes, because, without those skills, it would be difficult to perform assignments successfully” (P2MS1)

According to the discussion, it seems clear that phase (II) medical students focus on several skills subsumed under communication skills required to develop them, particularly during the academic and PBL setting. These skills are presented as follows.

Taking Notes

Note-taking is writing down the crucial points systematically mentioned in a given situation (e.g. lecture, conference, meeting, seminar) to help the students better remember and recall the significant information. It is identified as a critical attribute of being information literate within the context of FOM at KU, where recording is forbidden. For example, the notes taken in the PBL first session are seen as focal points that help students seek the appropriate information to do their assigned task and give the presentation for the second session.

“Let us say that a medical student must possess skills like note-taking, which enables a medical student to write down key points in the lectures administered by professors...that could serve as a working basis towards a more in-depth search for the information required for the completion of the assignment, which I think is the most important thing in PBL’s. In PBL class, we learned different things from different professors and even from one another. There was nothing specific, but it was helpful, nonetheless” (P2MS8)

Discussing & interacting

The transcript reveals that communicating with other colleagues and educators to discuss gathered information on specific topics significantly impacts and enhances a better understanding of the information found. As one interviewee said:

“So, for example, when I collect a substantial body of information about a certain topic, I find that discussing such collected information with a more knowledgeable person or even with professors is very helpful in arriving at a better understanding of this topic” (P2MS3)

Active listener

Good listening is identified as one of the communication skills that must be acquired by phase (II) medical students in the preclinical context. It is also recognised as a critical part of the IL attribute that results in posing the right questions. For instance, one participant expressed the connection:

“Of course, a medical student must possess communication skills such as being a good listener; this is also important for being able to ask the right questions” (P2MS8)

Leadership skills

Leadership skills are considered an essential component that a phase (II) medical student must have when appointed as a moderator in a PBL environment. In this situation, the student must apply such skills to effectively and successfully manage the sessions with other colleagues.

One attendee reported that:

“Then there are other skills that the medical student must possess, such as moderating discussions. For example, during PBL classes, students take turns playing the role of the moderator, but if the student lacks leadership skill, to play such a part successfully could prove difficult” (P2MS3)

Teamwork skills

Developing working skills as a group is also recognised as an essential element within the environment of PBL class. Phase (II) medical students identify this ability to facilitate better collaboration between team members to share the tasks of searching for relevant information from different resources. As one interviewee explained the scenario:

“The primary emphasis is upon work as part of a group or teamwork so that every student allows the other the opportunity to speak. This concept is further developed in each session by dividing each work group into a moderator and several scribes, where the former determines the topic of research and the latter looks for textbooks that could be relevant to the research topic to arrive at the most significant points to be researched” (P2MS2)

5.5.3. Attitudes

Several different attitudes emerged from the interview transcripts as a significant component of being information literate in the preclinical phase. These are:

5.5.3.1. Motivation (*wanting to learn*)

This motivation is perceived as a critical driver for phase (II) medical students to be information literate in the medical field. It was identified as an essential element to have motivation from the inside to seek further information beyond the standard curriculum.

“I think it depends on the person. There is a student who wants to learn, and his objective goes above and beyond just passing the exam. However, not everyone has that drive or motivation actually to seek information beyond the curriculum” (P2MS6)

5.5.3.2. Open-mindedness

Being open-minded is considered a positive quality within the context of medicine and is defined as being receptive to various ideas, possibilities, and information. From the analysis,

therefore, it is perceived as a necessary property for medical students to think critically and rationally. As one interviewee explained the example of being open-minded in specific situations to address medical issues:

“Among such important skills is the ability to think along broader lines. For example, in the cardio module, differential diagnoses must not necessarily be cardiac and may include other possibilities, such as muscular disorders” (P2MS2)

5.5.3.3. Initiative

Taking the initiative is an attribute of being information literate in the medical field. It is perceived as critical for phase (II) medical students to seek further information to bridge the knowledge gap. The transcript also shows the necessity to take the initiative and address the lack of information by asking before making the ultimate medical decision. It was stated that:

“There is also the matter of moral courage. Even when you feel your information is lacking in this field, you should have no problem asking someone more knowledgeable for help. There is no place for timidity if you want to learn, especially in the medical field, where you are ultimately responsible for the lives of your patients” (P2MS12)

5.6. Information literacy education

This section presents the existing state of ILE from the angle of phase (II) medical students, as shown in Figure 5.3.

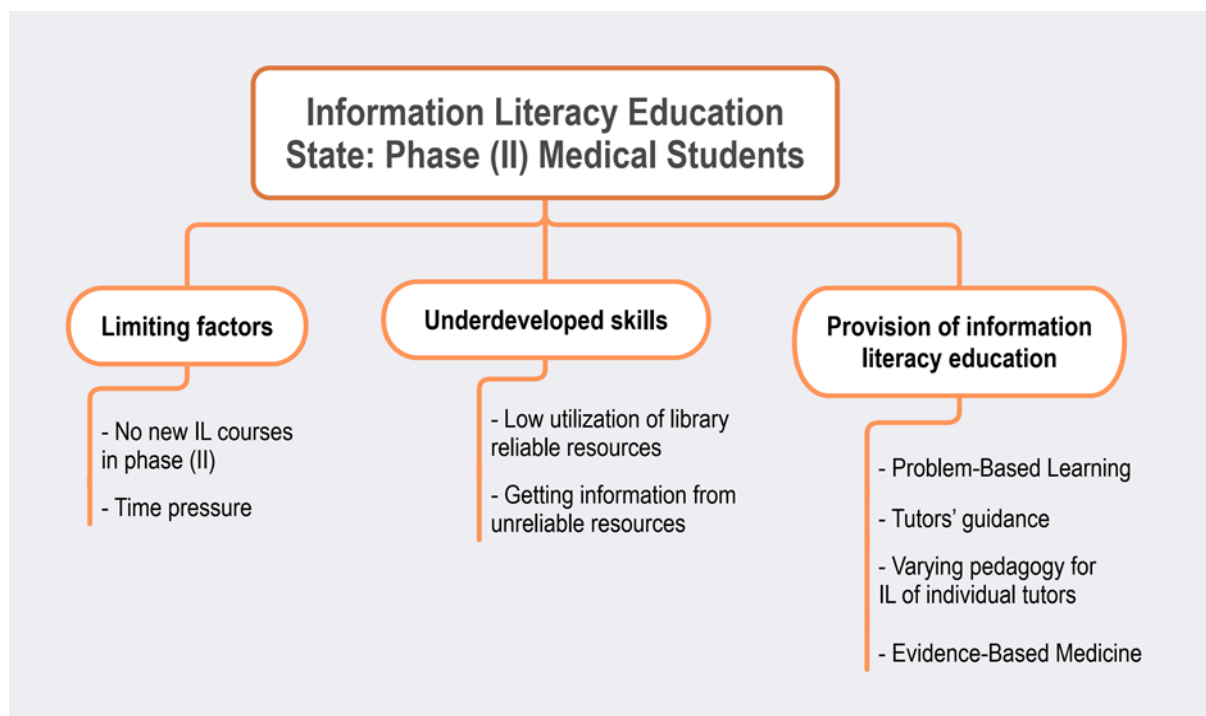


Figure 5-3 Information Literacy Education: Phase (II) Medical Students

5.6.1. Provision of ILE in Phase (II)

PBL class

The discussion reveals that phase (II) medical students identify several pedagogical approaches to educating IL skills within the environment of PBL sessions. When asked about the nature of assignments they did during phase (II), the participants were unanimous in the view that no assignments or coursework required IL skills to achieve during the preclinical phase apart from conducting the weekly PBL tasks as P2MS8 stated:

“We didn’t get many assignments as second phase medical students, with most of such assignments being in PBL classes”.

Most participants agree that PBL sessions are regarded as a significant approach to practising IL and play a major part in supporting the development of being information literate in the medical field. This emerges during the discussion when they reflect on the SCONUL model diagram, used as a guiding framework in the interview, to find that they unconsciously practise most IL skills and knowledge in the model during the PBL environment. For example:

“That fairly summarises what we do in the PBL class...” (P2MS2)

“I think you need all of them, to be honest. In fact, we used all these skills in PBL classes...” (P2MS6)

“I think that we have applied and practised such IL skills as provided for in this module. For example, in PBL classes...” (P2MS1)

Tutors’ guidance

Although the central role of the PBL facilitator is confined only to making sure that students are in the right direction, it is observed that some academics strive to teach the students IL skills, which take the form of guidance and tips. According to the transcript analysis, PBL tutors teach students skills in two main ways: (1) guide them to search reliable medical information sources and (2) help them define the most appropriate keywords and concepts that facilitate locating the most relevant resources:

“As third- and fourth-year medical students, we were taught by some tutors in the PBL basic IL skills such as how to analyse information and how to extract key clues in any given case and how to ensure that we get the correct information from reliable websites” (P2MS3)

Varying pedagogy for IL of individual tutors

Some medical academics advise students to note the reference list at the end of each lecture script, notes, and slides. It is a way of increasing their awareness of seeking further information beyond the lecture handout. As one interviewee stated:

“I appreciate it when professors after they give us the PDF file at the end of the lecture, they advise us to refer to the book, such as the book of biochemistry and so to help us understand where he got the information” (P2MS12)

5.6.2. Underdeveloped skills

In this section, it is worth noting that some quotes are reported from third-person perspectives, as evident in the following example. Participants are aware of the difficulties they encounter, particularly regarding information seeking and evaluation in the context of PBL class. Thus, they identify a set of deficiencies, which are as follows.

Low utilisation of reliable library resources

One interviewee argues that the library resources are not fully exploited by most phase (II) medical students for doing PBL tasks despite there being a wide range of portals through which they can seek more reliable information. It is stated that:

“This is a crucial point. I mean, the university provides a full subscription for almost all databases, yet some, not all, students fail to use such excellent sources of information in favour of less reliable sources” (P2MS4)

Getting information from unreliable resources

Interviewees asserted that phase (II) medical students use less reliable resources to accomplish PBL tasks For example:

“Many students use bad sources or base their research project upon unvetted articles obtained from unreliable sources. Of course, such information may sometimes be good, but the fact that it isn't obtained from reliable and approved sources makes it less than ideal in a PBL class” (P2MS8)

5.6.3. Limiting factors

Several factors are identified during the discussion, which might be the leading cause of the students' deficiencies. These comprise:

No new IL courses in phase (II)

Interviewees place much emphasis on the significance of IL. However, they reflect on the shortage of IL skills courses and training within the setting of FOM during phase (II). Therefore, they recognise their need for more continuous training to achieve their academic tasks:

“I think it's crucial. But I feel like we weren't prepared enough. I mean, we only took one or two weekly sessions as first-year medical students where they taught us how to conduct database searches and things like that, but of course, we were going to forget these four years down the road” (P2MS7)

Time pressure

Unlike phase (I), time pressure in phase (II), can be seen as a significant impact that mainly influences information seeking and gathering to accomplish PBL tasks. Hence, one interviewee describes how time pressure affects the students' way of obtaining information to be presented acceptably without profoundly engaging in the process of information understanding and analysis in PBL sessions:

“I feel that PBL tasks place extra pressure upon the student who has much more pressing things to do, such as going over lecture notes and textbooks, and to give them an additional task is frankly asking too much, and that is why you see most students trying to hastily get the required information off the internet and make a reasonable presentation during the second session, but they just read the words without really understanding any of it” (P2MS11)

Time pressure and overloaded work are recognised as a major impact that affects students' information-seeking behaviour. The same previous participant claims how little time is spent to identify information needed for PBL tasks because of the time pressure factor. As a result, they often gather their information from untrusted sources, although they are aware and rate them as the least reliable sites, while online medical journals are the least used sites.

“As a result of the fact that the curriculum is overloaded with such a limited time to cover it in, I usually look for information required to complete PBL tasks on websites such as Mayo Clinic, but occasionally, when I want a quick piece of information, and I know that is wrong, I'd go to websites such as WebMD, which is a site that contains medical information but its content is not always reliable. It is the medical equivalent of Wikipedia, and that is why we have been warned not to use it because it is not considered a reliable source of information compared to PubMed websites, but like they say, desperate times call for desperate measures (laughing)” (P2MS11)

5.7. Summary

Phase (II) medical students describe IL in two categories: (1) as core competencies and (2) as higher-order cognitive skills arising in the context of academic study and PBL classes. Within phase (II), information-literate students possess three main attributes: knowledge, skills and attitudes in the medical field. PBL is recognised as the most critical opportunity through which phase (II) medical students learn IL skills. The lack of a new IL course in phase (II), coupled with the time pressure, has been identified as a significant factor that affects the students' information-seeking abilities and the development of their IL.

Chapter 6 Case Study Report: Phase (III) Medical Students

6.1. Introduction

This chapter presents findings that emerged from interviews with phase (III) students as the third unit of analysis. It starts with the context of the clinical phase (III). Then, the three themes elicited from thematic analysis, including conceptions of IL, the characteristics of information-literate students in the medical field and ILE, are presented.

6.2. Unit of analysis report

6.3. Phase (III) medical students: case context

Phase (III) covers the last three years of the programme, known as clinical phase (years 5-7). Upon completing this phase, students are awarded a Doctor of Medicine (M.D.) degree. Unlike the preclinical phase, the clinical phase emphasises “the clinical competence theme”. During this phase, students are given a variety of clerkships and school-day activities. Clinical PBL and activities on Medical School Day (attending lecturers on campus) are essential because they enhance student independent study. Otherwise, the primary activities are clinical and hospital-based. It is stated that “in all clinical activities, there will be specific opportunities to integrate basic medical sciences with the clinical science being observed and practised. Throughout the three years, about 30% of all scheduled weeks will remain unscheduled for self-directed independent study” (Faculty of Medicine, 2022, p.86).

Throughout Medical School Day, the format of teaching activities is flexible but usually includes two split lecture sessions. One seminar is frequently designed with a multi-discipline theme. Finally, each week, a group of three students organises a seminar presentation before senior staff with relevant expertise. Apart from student-led seminars, all activities are supported by providing learning objectives and an overview of each session (Faculty of Medicine, 2022).

Throughout medical clerkship, students need to develop a logbook to evidence their activities for most clerkship rotations and to record their attendance and participation. Clinical students are expected to demonstrate many clinical skills that ensure their participation in activities led by students from the outset. These skills include: “Patient clerking, both on the wards and outpatients, note writing, presentations with patient demonstrations, and small group tutorials are expected to be stressed. A PBL case will be studied every week, one set of clinical notes will be submitted and marked by a clinical tutor, and all activities on Medical School Day are compulsory” (Faculty of Medicine, 2022, p.87).

Year 5 students, during the Community Medicine rotation, are equipped with lectures, learning topics, and small group tutorials for undertaking the task of a research project later. They are prepared to complete a community-based research project on Community Medicine or a health situation analysis in small groups, which is then presented as a part of student-led seminars.

Regarding attendance regulation, phase (III) students must attend all clinical and Medical School day activities involving lectures, tutorials, seminars, small group teachings, practical sessions, PBLs, clinical skills lab sessions, clinical sessions, and hospital visits. In case of absence from these activities without an acceptable excuse, and based on the regulations of FOM, students will not be permitted to attend the final examinations. Assessments like MCQs, short notes, clinical examinations, and objective structured clinical examinations (OSCE) are the most used formats in the clinical phase (Faculty of Medicine, 2022).

6.4. Information literacy conception

From the analysis of transcripts, phase (III) medical students defined IL in the medical field from two perspectives: core competencies and concepts framed within biomedical settings, as shown in Figure 6.1. The former focuses on the baseline elements medical students should possess to attain their educational and professional tasks. At the same time, the latter is defined from a more focused perspective as clinical students' or physicians' ability to analyse clinical data and apply medical evidence to clinical cases. These two categories are explained further in the following sections.

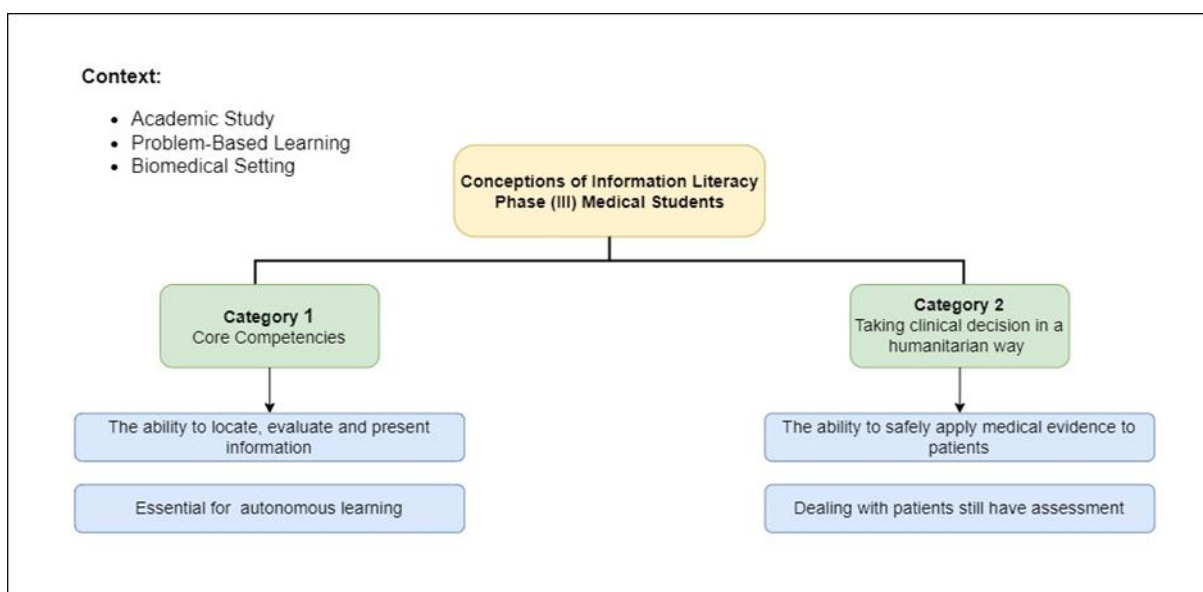


Figure 6-1 Conceptions of Information Literacy: Phase (III) Medical Students

6.4.1. Category (1): core competencies

IL is considered the ability to locate, evaluate and use information effectively and efficiently. It is also recognised as a critical skill that all medical students must acquire to practise their future careers in hospitals successfully. For example, one participant indicated that:

“To be honest, my view of IL skills is the ability to find information relevant to the research topic, evaluate such information and finally present this information to the students. There is no denying that a student has to be information literate to be a good doctor and make an impact in the medical field” (P3MS11)

Another interviewee describes information literacy as critical to shifting the learning mode from dependent to autonomous learners.

“Information literacy means that only a small part of your information is spoon-fed to you while the greater part is acquired through information skills, and all of our study depends on information skills” (P3MS5)

6.4.2. Category (2): taking clinical decisions in a humanitarian way

Phase (III) medical students describe IL from a biomedical perspective as an ability that empowers them to make informed judgments when medical information and clinical data come from many directions and sources. In this case, they need to be information literate to process all these various kinds of information and data and then draw a strong connection among them to reach critical decisions in patient care.

“When a patient comes in with many tests to be done, I usually have more than one thing going on in my head, but the first thing that pops into my mind is that this is a lot of information to be processed. We need to identify and sort out the bulk of information in front of us and then put them together in a context that makes sense. This requires that we understand what these tests are and what the steps and labs are pointing towards. So, I believe this is one form of information literacy skill no doctor can ignore. It's an essential skill that all doctors have to learn” (P3MS2)

Another participant defines IL as the ability to apply the best available research information and evidence to make clinical decisions considering patient privacy. It seems clear that it aligns pretty well with the EBM approach, which aims to increase the use of high-quality research in patients' care by considering their values.

“The most important thing is for the doctor to have correct and scientifically proven information and to know how to apply it properly, while respecting the patient's privacy and without causing harm to the patient” (P3MS12)

6.5. The characteristics of information literacy students in the medical field

Phase (III) medical students draw a comprehensive picture of being an information literate student in the medical field. The analysis reveals that they perceive information literate in the medical field as those who possess diverse forms of knowledge as well as different types of skills supported by a range of specific behavioural attitudes to achieve the overall aim of the medical discipline, which revolves around the practical application of the acquired basic science knowledge in the clinical context.

Figure 6.2. provides an overarching graphical illustration of the main attributes that constitute information-literate students in phase (III). These attributes emerged from the analysis of semi-structured interview transcripts, which include three main categories: knowledge, skills and attitudes. These categories are presented as follows.

Acquisition-specific knowledge includes:

- Technological knowledge
- Medical terminologies

Developing a range of skills includes:

- Identifying the information needed (Identify)
- Assessing the current knowledge and identifying gaps (Scope)
- Constructing strategies for locating information and data (Plan)
- Locating and accessing the information and data they need (Gather)
- Evaluating information and data (Evaluate)
- Organising information professionally and ethically, as well as the ability to effectively manage their time to complete the assigned tasks and activities within deadlines (Manage)
- Synthesising information to create new knowledge or clinical conclusions (Synthesise)
- The ability to communicate orally and non-orally with students, academics, patients and other healthcare professionals, as well as to present information and research findings to others (Interpersonal & communication skills)

Attitudes include:

- Motivation
- Open-mindedness
- Being patient
- Curiosity
- Taking more responsibility for learning

Information implementation and application skills:

- The ability to apply medical information to clinical or research work

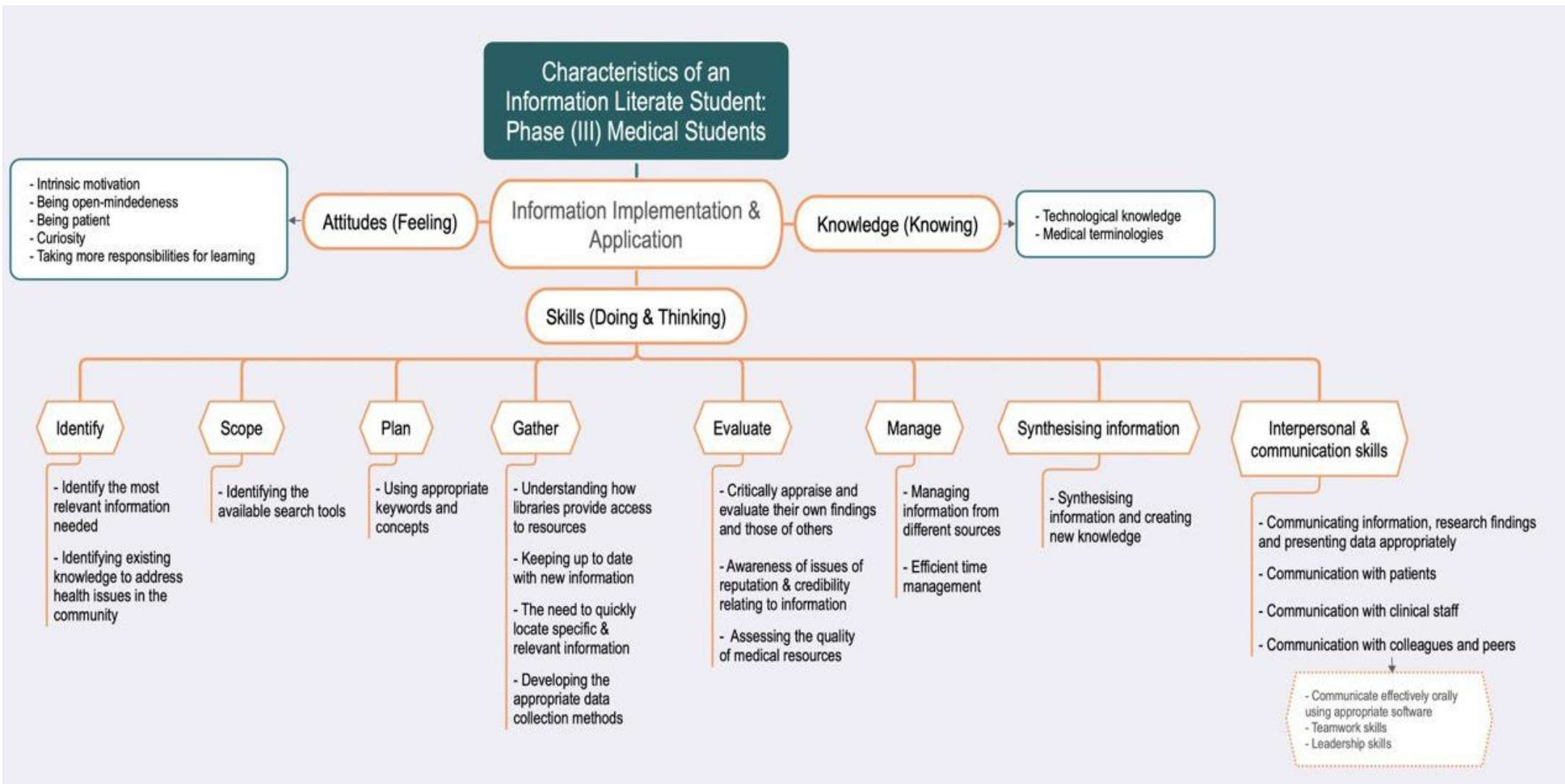


Figure 6-2 Characteristics of an Information Literate Student: Phase (III) Medical Students

6.5.1. Knowledge

The critical aspects of knowledge identified by phase (III) medical students can be listed as follows:

6.5.1.1. Technological knowledge

The transcripts reveal that phase (III) medical students believe that possessing some technological knowledge is significant to their academic and medical careers. This, for example, includes acquiring technical knowledge to access and use medical databases:

“We also need to master certain research-related skills, such as how to use the computer, how to get certain information, and what are the suitable sources from which to get the material for your research topic” (P3MS12)

Another necessary knowledge is related to acquiring knowledge in using basic software applications such as Microsoft Office Programs:

“How to use the databases to get access to information resources. How to use Microsoft Office tools such as Word, Excel, and PowerPoint” (P3MS6)

Some interviewees also emphasised the necessity of using specific software packages like statistical software programs (e.g. SPSS). This need arose from the nature of quantitative studies that they required to conduct through phase (III) as mandatory requirements:

“It is part of technological literacy, which includes how to use the computer and how to use certain Apps, such as SPSS, which is a powerful statistical analysis software, and as such can be very helpful” (P3MS9)

Another participant said:

“You also have to develop the data analysis skill and how to use the appropriate data analysis software, such as SPSS, which is also an essential skill” (P3MS12)

One participant indicated the need to use such an application from a statistical perspective to analyse quantitative data to find the relationship between the variables.

“...being our first try on using SPSS statistical software, which is key to analysing statistics and measurements and finding relationships between numbers on the one hand and the psychological condition on the other, using such software was the hardest thing for us, but it was also a new and useful experience” (P3MS11)

6.5.1.2. Mastering medical terminologies

Students also believe that information literacy in the medical field requires knowledge about medical terminologies. There is a strong relationship identified between mastering such terminology and developing IL skills:

“Of course, the medical field is different from other fields of specialisation because a medical student has to be fully aware of each disease-specific medical terminology and how each term is written to search for medical information” (P3MS11)

6.5.2. Skills

Phase (III) medical students identify several skills as core elements of being information literate in the medical field, which are represented as follows:

6.5.2.1. Identify

Identify the most relevant information needed

Identifying the most relevant information needed is critical to being information literate for phase (III) medical students. The analysis reveals that they must be able to determine the most pertinent information required to fulfil assigned tasks. For example, one participant explained how this skill is of importance to medical students by reflecting on a situation that happened in the context of a PBL class:

“...but above all, it depends on whether it was related to the topic. For example, I remember that a colleague was once given a paediatrics-related task about a certain childhood disease. While he was in the middle of his presentation, he was stopped by the supervisor and told that the disease he was making the presentation about was an adult disease. So, he didn't properly refine his search and took the information with little or no evaluation” (P3MS7)

Identifying existing knowledge to address health issues in the community

When asked about the most significant information skills needed to achieve their learning tasks during phase (III), students reflect on their need to formulate the proper research questions following assessing the current knowledge and identifying the information gap. This ability is essential in conducting research projects, a vital attribute of the IL concept. One informant reported that:

“We needed some understanding of basic epidemiologic terms and learning how to formulate productive research questions. So, we first had to look at the current needs of the surrounding community and then develop the research questions. So basically, while we thought of what the research questions should be, we still need some good skills to sort those out” (P3MS2)

6.5.2.2. Scope

Identifying the available specific search tools in medicine

Phase (III) medical students demonstrate an awareness of the different research tools regarding general and subject-specific resources offered at different levels. One interviewee gives an example of how PubMed as a search tool provides information and resources that cannot be addressed and answered by other available information sources:

“Because PubMed usually covers questions that we students think about, it goes beyond the basic search questions, like differential diagnoses, and the questions usually answered by clinical examination textbooks. So, even if I think of questions that are still unanswered or that are under research, I tend to go for PubMed and some other resources to see what treatment is being offered and compare the information that I get with the information that I already have” (P3MS2)

6.5.2.3. Plan

Using appropriate keywords and concepts

Students identify the ability to use appropriate keywords as an essential component in defining a search strategy. They recognise this as a necessary step to construct a complex search strategy, which makes a difference in the depth and breadth of information. As one interviewee put it:

“But learning how to use keywords, for example, is necessary, because if you don’t possess such simple search skills, you won’t be able to conduct advanced databases searches” (P3MS7)

6.5.2.4 Gather

Understanding how libraries provide access to resources

Students have a strong recognition that the library is considered one of the major sources through which they can access the potential subscribed and free resources. For example:

“We have access to PubMed without any subscription fees. We can access it through the faculty library’s computers. We also have access to all medical journals, and it is all free of charge” (P3MS4)

“We accessed all available sources of information through PubMed, which we can access free of charge at the faculty, and we compared the articles there about hand hygiene with information in the literature” (P3MS9)

Keeping up to date with new information

During phase (III), medical students emphasised the importance of being information literate to be up-to-date with the latest medical developments. This is because of the rapid change taking place in the clinical context, where students need to be aware of the various information retrieval tools:

“They are fundamental skills because they enable medical students to access the latest medical knowledge, which is not true if you depend solely on hardcopy textbooks. I once heard a professor saying that there is at least a five-year hiatus between the authentication of a given piece of medical information and its eventual publication, which shows how important is the acquisition of database research skills to having access to the latest medical knowledge” (P3MS7)

The need to quickly locate specific and relevant information

This attribute is closely related to the clinical context, distinct from the preclinical phase. Phase (III) medical students need instant access to answers to every patient query and specific clinical cases. The situation was explained by stating that:

“During the clinical phase, we need access to online resources like UpToDate sources to get the information on the spot because it is hard to find the information quickly enough when you have to find it in textbooks, particularly in the middle of clinical rounds or working part-time. Textbooks may be the information source of choice during the preclinical stage when you have ample time to look for the information you need” (P3MS11)

“UpToDate is an electronic clinical resource tool that provides information on Adult Primary Care and Internal Medicine. It can be downloaded on your mobile phone as an application, which the university must provide us with access to because you can search for whatever information you need through it, get a complete answer to your questions and be provided with all relevant references. In about 90% of the cases, I relied upon an UpToDate and rarely used PubMed database because it mainly provides research articles, unlike UpToDate, which provides full explanation and full lists of references” (P3MS5)

“UpToDate has the advantage of being easily usable and accessible and containing reliable, constantly updated information. Many academics recommend UpToDate to be the main source of information for medical students during the clinical phase” (P3MS7)

Developing the appropriate data collection methods

The transcript reveals that developing the proper data collection method, such as a questionnaire, was identified as a critical skill medical students must develop during phase (III). As one participant stated:

“Following the academically correct steps in developing such questionnaires to serve the research process and avoid bias while remaining clear and understood by participants. This is certainly one of the key skills” (P3MS12)

6.5.2.5. Evaluate

Critically appraise and evaluate their findings and those of others

This quality was identified as phase (III) medical students' ability to better compare their findings and those of others existing in the literature. This attribute requires high critical and analytical skills:

“We used to read the articles and compare the information we collected from the results we arrived at with the results of the other studies in the literature” (P3MS9)

Awareness of issues of reputation and credibility relating to information

Phase (III) medical students show greater awareness about the reputation and credibility of information used for specific purposes such as PBL presentation:

“I rely exclusively upon textbooks and websites like UpToDate and never used sites like Wikipedia for fear of presenting the wrong information to students in class. However, I may use Wikipedia for my study, but not when I need information to be presented in PBL class” (P3MS10)

Assessing the quality of medical resources

The need to assess and evaluate the value of medical resources was defined as a highly required skill in an information-rich environment. Such skills are much needed in the clinical setting and in the EBM module, where the best evidence selection is of significance. One interviewee explained that:

“I would say evaluating information is the key skill because even though we have some reliable websites, we will still have unreliable research articles that are untrustworthy or lack valid scientific content. So, developing information evaluation skills must account for a greater part of the work done in the medical setting. I mean, you can go to all sorts of websites and sources, but it's essential to evaluate whether the information you get can be used to answer the question you're asking” (P3MS2)

Another participant echoed the same issue but from a clinical perspective:

“The evaluation skill is important because information is everywhere, but not all information is correct or deserving of attention. So, we need this skill to evaluate the information and determine what serves the cause of medicine and provides a solution to the problem at hand” (P3MS12)

6.5.2.6. Manage

Managing information from different sources

Phase (III) medical students are exposed to a large volume of information from various sources such as lecture notes, handouts, printed and online textbooks, practice guidelines, reliable YouTube posts, daily round practices in hospitals, etc. Effectively managed information was highlighted as a critical ability to engage with all these resources fully. As one interviewee articulated the challenge of handling all of this information:

“We still faced considerable difficulties because, in the clinical phase, we had numerous information sources like lectures, lecture notes, textbooks, research articles and other clinically essential materials, which meant that we had the massive task of organising such information together to enable us to handle them effectively (P3MS1)

Efficient time management

Most interviewees in phase (III) identified their need to manage their time effectively and efficiently to overcome the challenges resulting from time pressure and busy schedule constraints in the clinical setting. For example:

“Time management is the most important thing. The clinical phase is much more exhausting and time-consuming than the pre-clinical phase as the students spend a lot of time working rotational shifts at the university hospital while at the same time attending theoretical lectures, so they need to develop their time management skills” (P3MS6)

“The third thing is to develop the skills of punctuality in terms of attendance and absence rates in addition to time management skills since the situation during the clinical phase is different from that during the preclinical phase. During the clinical phase, medical students must attend daily, while preclinical students are allowed a certain level of absence. and that being the case, one needs to be able to strike a balance between daily activities and medical study” (P3MS12)

6.5.2.7. Synthesising information

Phase (III) medical students recognised their need to improve IL skills, particularly in undertaking research projects to accomplish their academic tasks. These skills are mainly associated with synthesising, comparing and contrasting information from different resources. One interviewee articulated the challenge they encountered as being the first experience of doing the research project and thus highlighted their need for developing such these higher order IL skills during the medical program, saying:

“Another skill is to contrast and compare the different articles and to be able to extract the relevant information. This was, I believe, my first exposure to writing research papers. So, we have difficulties in these aspects. I don't know if there is an easy way to develop this skill, but I think that we have to have tools like courses or anything that may develop the skill of having efficient ways to collect information and compare them” (P3MS1)

The participant clarified the issue when asked whether it was related to the language barrier or another aspect. It was explicitly stated that the problem was mainly concerned with the information itself, especially to do with information synthesising skills:

“Must overcome the language barriers and understand the information itself to be concise when writing about the subject taking our time and not to focus only on the language but also on synthesising the information while writing” (P3MS1)

One of the aims of such a research project is to contribute to medical practices and healthcare services.

“A possible use for this information [research findings] is to improve medical practice and public health” (Student Guide for CMBS projects, 2016, p. 7).

6.5.2.8. interpersonal skills

Phase (III) medical students identified several interpersonal skills they need to develop in research and clinical contexts. Most of them are articulated as challenges they face while conducting their research project in phase (III). They are represented in the following sections.

Communicating research findings and presenting data appropriately

The transcripts reveal students’ interest in developing academic writing skills and present their findings in a way that enables them to communicate with other audiences. As one interviewee put it:

“...how to arrange all the information and results obtained and finally how to present the results in a professional way that captures the attention of all concerned in that particular research topic” (P3MS12)

The ability to comment on and present the findings in tables and figures in the results section of the students’ own work was also identified as a critical competency. This includes depicting the relevant and significant data and making them understandable to the research audience and readers. This seemed clear through the discussion that took place between one of the participants and the project supervisor:

“For example, when I presented research results, I felt that graphs and diagrams needed no comment and were self-explanatory, which was one of the reasons for which I received a lot of criticism from the supervisor who said they are self-explanatory to you because you did the research and arrived at the conclusions which is not the case for the general public who need further explanation to simplify the presented material and make it easier to understand. That was a hard skill to learn, and we would not have been able to master it on our own” (P3MS10)

Communication skills

Phase (III) medical students explicitly identified their need for communication skills at various levels. This is described in detail as follows:

Communication with clinical staff

Some interviewees from phase (III) emphasised the importance of establishing good communication skills with clinical staff in the hospital setting. Such skills can enable them to find and use experienced physicians as hospital information sources. This is an effective way of accessing clinical information formed over long clinical experience in Kuwaiti healthcare.

“Personally, the most important resource and the easiest to access is to ask your senior at the hospital because you will always need to ask about things not found in the textbooks...for example, how things go at the hospital. Hospital staff can sometimes be a precious source of information because they can answer many questions you probably can’t find in textbooks. I mean, only a professor would be able to give you a valid answer if you ask whether a certain procedure is being done or a given protocol is applicable in Kuwait” (P3MS8)

Body language is mentioned as an essential skill that phase (III) medical students need to develop, particularly when presenting information in front of other clinical colleagues in everyday morning meetings in rounds:

“...including how to present your case in clinical rounds, particularly how to move your hands and use body language. For me, such skills are much more important than the information being presented because information is easily accessible” (P3MS3)

Communication with patients

Most participants indicated this attribute as a critical ability to communicate with patients for the sake of taking history notes. It was recognised as IL skills that they need to develop to deal with patients in a sympathetic way to elicit the required information, which is vital in developing a treatment plan:

“There is also a need for contextualising your approach to the patient. I mean, medical students have to be information literate. First and foremost, they have to be aware of how to communicate with the patient, how to conduct the examination, how to take medical history and how to access relevant, disease-related information to remedy any information deficiency they may have and ensure the correct medical diagnosis and provide the best service to their patients” (P3MS12)

Communication with colleagues and peers

The need to effectively communicate with colleagues was identified as a critical skill to ensure the success of many assigned academic tasks, particularly within the context of PBL classes and research projects. Most participants indicated the importance of developing communication skills with colleagues, including orally presenting information, enhancing teamwork, and promoting leadership skills.

Communicate effectively orally using appropriate software

Phase (III) medical students concentrate on the presentation of information orally using suitable visualisation methods such as PowerPoint application. This is a practical approach to facilitating the understanding of the information presented. One interviewee articulated the challenge of information presentation in the PBL class:

“Another key skill is making presentations. Most of the students we have come across don’t know the first thing about PowerPoint presentations and only write down the information they read on a piece of paper and sit down and discuss it with us. I prefer PowerPoint presentations because information and ideas are up there in front of people so that they don’t get confused” (P3MS11)

Teamwork skills

Participants also pay much attention to work as a group. They must develop such skills to facilitate communication among all group members, ensuring achieving the academic tasks successfully.

“The thing that we need the most is to master the teamwork skills to be able to work as a group smoothly and effectively without undue complications” (P3MS10)

“...how to work as a team, and how to distribute tasks among us, but mostly focusing on communication skills among researchers and how to work within a team” (P3MS9)

Leadership skills

In addition, the transcripts revealed that enhancing the attribution of leadership to phase (III) medical students was a critical element in helping them communicate effectively to fulfil the task assigned:

“... but what we need most is a leader who possesses team management skills and can both manage and motivate the team to determine, for example, why a certain diagnosis is more likely than another and if one diagnosis is considered to be the most likely, what would be the most appropriate treatment” (P3MS12)

6.5.3. Attitudes

Several attitudes emerged as a primary attribute of being information literate in the clinical phase. These include:

6.5.3.1. Motivation (*wanting to learn*)

Being enthusiastic is essential for phase (III) medical students to become information literate in a clinical setting. However, they identify the importance of this attribute from two main aspects. First, motivation is essential to learning. As P3MS8 indicates, “It depends upon the student being motivated to learn”. Second, students need to show great willingness to learn clinical practices and guidelines in real hospital situations through having an intrinsic desire to keep in close touch with experienced physicians:

“I think that the most important habit that medical students have to develop during the clinical phase is to have the passion for hospital work and being around doctors in a real-life setting because that will reflect positively upon them in terms of the amount of information they will acquire” (P3MS10)

6.5.3.2. Being open-mindedness

Being open-minded from two main perspectives is essential for phase (III) medical students. First, they need to be open to others' opinions and to demonstrate a degree of respect to their views:

“We have to learn how to listen to each other, cooperate and be open to other opinions that may be different from our own and consider all arguments for and against because other opinions may just be the right ones” (P3MS12)

Second, they need to be open-minded to approach the clinical cases from different angles and broaden their thinking to expect all possibilities in the development of a treatment plan:

“Any person, whether a medical student or a physician, has to be broad-minded and not be stuck in a specific rotation. That helped broaden our horizons because we do not have to focus only on surgery or paediatric topics during our paediatrics rotation. So, I think the key is really to keep an open mind and to go through all potential possibilities” (P3MS2)

6.5.3.3. Being patient

Although only one interviewee stresses the importance of being patient in the clinical phase, this reflects the reality of clinical situations characterised by time pressure and work overload, which therefore requires phase (III) medical students to show a high degree of patience, particularly with occasional recurrent night shifts:

“During most of our shifts at the hospital, we have to interact with patients and professors, and the main thing you have to have is a lot of patience to get you over the work pressure and the professors' constant demands. Only a medical student would know how exhausting work at the hospital is, especially if having to study is combined with attending night shifts” (P3MS5)

6.5.3.4. Curiosity

Curiosity is essential to becoming information literate in the medical field. One interviewee identifies this as curious to seek further information to keep up with the latest medical developments.

“...Medical students must have a healthy curiosity and always try to understand and even question the accuracy of the information they are given and not take it for granted. They also need to be curious to read in-depth to stay updated with the latest medical developments and innovations” (P3MS3)

6.5.3.5. Taking more responsibilities for learning

Due to the absence of a defined curriculum in the clinical phases, most phase (III) medical students identify the need to take more personal responsibility towards their learning and seek information from multiple resources. For example:

“Unlike the preclinical years, when we were spoon-fed the information, the clinical years are about being more self-dependent and developing ways to look into approved resources. So, the skills that you most need are those that enable you to recognise which databases are reliable and which aren’t, because, you know, this is not a joking matter” (P3MS1)

“But when I got to the clinical phase, I became more self-dependent and more involved in self-learning since the syllabus was not as well defined as in the preclinical phases 1 & 2. So, I started to search for more information in as many sources as possible so as not to be dependent on a single source” (P3MS10)

6.5.4. Information implementation and application

The transcript revealed that the ability to practically apply the acquired knowledge and information into a tangible reality in the clinical phase underlies the process of IL and considers the desired aim of being information literate in the medical field. Most clinical students recognised this attribution as their ability to transfer theoretical scientific knowledge into practical application in the clinical setting. This aligns with the academics’ views, which situate this competency at the heart of being information literate in the medical field and the ultimate goal medical students must fulfil. This seems clear from the dialogue between the interviewer and one participant when asked about the skills they need that are not represented in the SCONUL model:

Interviewee: “In this model, I would say it is the ability to apply the knowledge into their daily practice” (P3MS2)

Interviewer: What do you mean by daily practice?

Interviewee: “I realised how important it is to apply my previous knowledge in this field. Once I grasped this concept, I went to patients and tried to apply the clinical knowledge I had practically to these patients. I think we still are struggling in this part; the clinical information is delivered, theoretically, but the application in clinical and practical ways in daily hospital life is a bit different” (P3MS2)

6.6. Information literacy education

In this section, the existing state of ILE practices in phase (III), as shown in Figure 6.3., is discussed in the following sections.

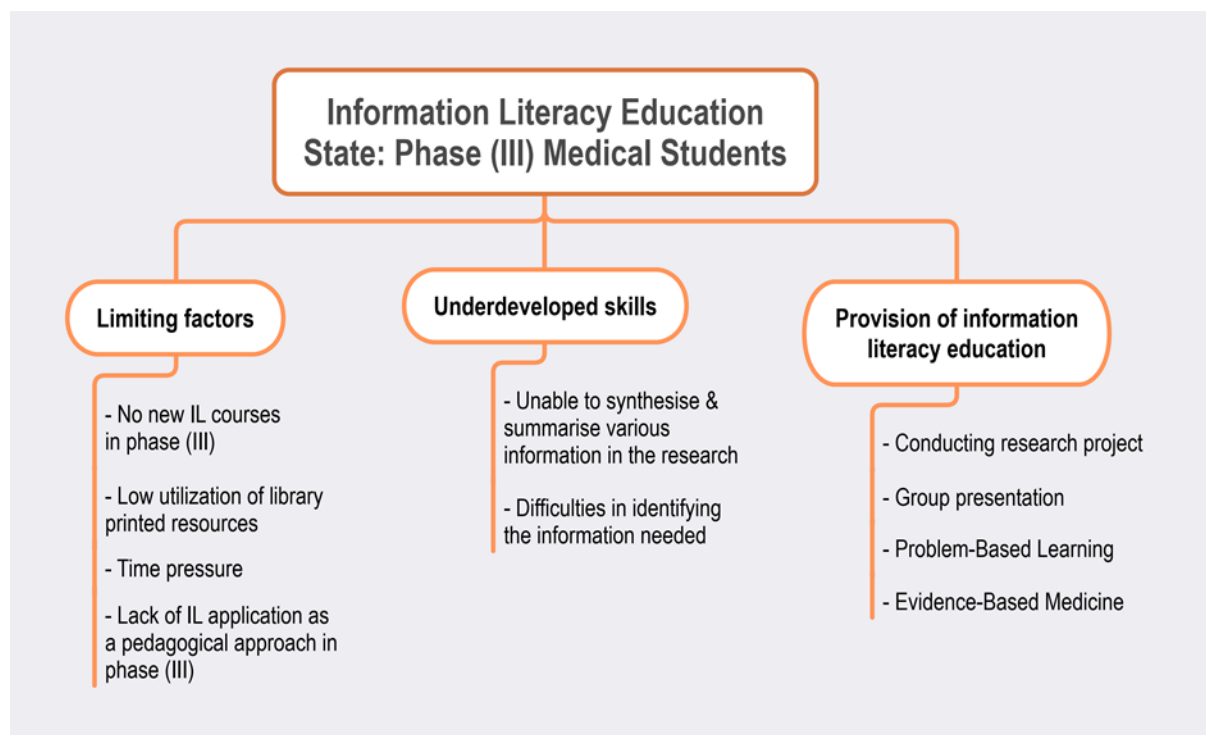


Figure 6-3 Information Literacy Education: Phase (III) Medical Students

6.6.1. Provision of ILE in Phase (III)

The analysis revealed that no new courses explicitly targeted teaching IL during phase (III). However, the transcripts supported by evidence that emerged from the study of documents found that phase (III) medical students had many opportunities through which they learned IL skills. These opportunities are discussed in the following subsections.

EBM modules

Several students recognised that they had learnt a few basic IL skills through EBM modules but without paying any focused attention. These modules are delivered through the second and third phases by academics from CMD.

“I don’t think that any course or subject addressed this topic, and professors only referred to it in passing, except (maybe) in community medicine classes, where we were taught how and where to look for information, how to present gathered information and what sites are reliable and what sites aren’t and what sites are intended for the general public and what sites are intended for health professionals” (P3MS12)

PBL class

Most phase (III) medical students acknowledged that they practise almost all IL skills in the SCONUL model in PBL sessions. For example, one interviewee explained how they apply all these skills in the context of PBL in an unconscious way after the whole seven years in the faculty:

“When I saw this model...of course, we were trained to apply all these skills in the PBL class [and] I felt that I had already gone through all these steps and learned all those skills, particularly in PBL classes...” (P3MS10)

Conducting research project

Students perceived that a research project, part of the curriculum during the clinical phase, also enhances students’ research abilities. For example, one participant demonstrates an awareness of academic writing style and scientific research steps:

“During the fifth year, we were given an assignment or a research project about a specific topic so that we could be taught how to follow the approved research-related steps and writing style as part of the curriculum” (P3MS9)

Furthermore, it was asserted that this research project was one of the effective methods through which phase (III) medical students practise IL skills.

“I think the research project that we did was the closest thing to applying IL skills in the medical field” (P3MS7)

Group presentation

This task, which is an essential part of the research project, was also identified as a pedagogical approach to communicating orally in front of a large and intended audience:

“As fifth-year medical students, we had to do a research project at the Department of Community Medicine, and then we had to make a faculty-level group presentation before the professors” (P3MS4)

6.6.2. Underdeveloped skills

This section presents a couple of deficiencies that phase (III) medical students perceived during the clinical phase. These are identified in different contexts, which are as follows.

Difficulties in identifying the information needed

The interview revealed that phase (III) medical students have difficulties identifying the information needed to accomplish PBL tasks. As one interviewee articulated, identifying the most relevant and best sources is one of the biggest challenges facing most students when doing PBL tasks. This perception is shaped from a third-person perspective, as evident from the following quotation:

“The main problem is that they [person’s classmates] don't know how to correctly look for the required information either because they don’t properly refine their search or they don’t know where to look. I saw many students come up to the professor on the day they were supposed to make their presentation and say that they could not find the information required for the topic they were supposed to speak about because they didn’t know the right sources of such information” (P3MS11)

Unable to synthesise and summarise various information in the research

Within the context of the research project, phase (III) medical students recognised that they faced real difficulties in synthesising information from different sources. This seemed clear when one participant illustrated this deficiency in their research project as a first experience and how their supervisor provided further support in this perspective:

“At first, it was tough to learn, but the supervisor helped us master research and academic writing skills, including incorporating information from various sources into a fully integrated research paper... Initially, however, we did not have such a skill...So, it is nice to acquire such skills, but they need a lot of practice, and with practice, we can develop these skills, which we as medical students need very much” (P3MS9)

6.6.3. Limiting factors

The interview revealed a set of factors that potentially hinder the development of IL within the clinical phase. These are as follows:

No new IL courses in phase (III)

Despite the significance of IL skills to medical students, there were some negative comments about the absence of ILE and courses during the clinical phase. One participant provided clear evidence of the shortage of ILE, which is only offered to them during the first year of the first semester, and how he even forgot the name of the course after a long period:

“To be honest, we only learned about how to use databases in a single course administered during the first year. Unfortunately, I forgot the name of the course” (P3MS7)

lack of IL application as a pedagogical approach in phase (II)

Phase (III) medical students explicitly indicated that the scarceness of pedagogical approaches that support the development of IL during the preclinical phase is seen as a significant factor that influences the development of IL. As one interviewee stated, it is impossible to learn such skills unless they are used and applied in specific educational situations:

“Of course, this was very important, but in my opinion, it was tough to learn and not sufficiently applied in a useful way. The course was administered during the first year, but we were not asked to apply what we learned in subsequent years, such as the second or third years and at the end of the day, I am only required to study the lecture notes because exams are based on such notes. It is

only when you get to the fifth year that you begin to appreciate the value of such research-related skills” (P3MS7)

Another participant asserted that they were unaware of the importance of such courses in the first year and did not pay much attention until they reached the clinical phase. Thus, they recognised the need for such skills in the context of doing research projects during the clinical phase:

“To be honest, as a first-year medical student, you don’t pay much attention to these things and don’t even appreciate how important they are, but when you get to the clinical phase, you begin to truly appreciate how important research skills are and how much you need them to re-teach you such skills” (P3MS3)

Time pressure

It seems clear that the time pressure factor impacts phase (III) medical students much more due to the busy timetable divided between the hospital and the campus.

“Knowing that those students still have to attend rotational shifts and clinical rounds at the hospital not to mention having to turn in case reports at this or that department and at the same time attend at the faculty” (P3MS7)

The discussion revealed that time pressure was perceived as a critical factor in shaping their search. It is recognised that under such challenging circumstances, phase (III) medical students follow the principles of least effort while seeking information within the context of PBLs. They heavily rely on familiar search tools such as Google and accept poor-quality information by copying and pasting data from less or sometimes unreliable websites to present in PBLs. As one interview stated:

“I would say that we all followed the same scenario because we were all exhausted and did not have much time. So, suppose we were given a research topic we knew nothing about, such as Diabetes Mellitus! We all used search engines, not only me (laughing). Some students copy and paste the content from any websites they came across” (P3MS8)

Low utilisation of library printed resources

Using the library’s resources is assumed to reflect positively on the student’s level of IL and their attitudes. However, one interviewee claimed that students do not borrow information resources from the library because they purchase their own recommended textbooks:

“I didn’t borrow any books over the seven-year study period and didn’t know of anyone who did, to be honest, because most students had their books whether as a hard copy or on their iPads” (P3MS12)

6.7. Summary

The analysis revealed that phase (III) medical students have defined IL in two categories: (1) as core competencies and (2) making clinical decisions in a humanitarian way. These concepts

are experienced in academic study, PBL classes and biomedical settings. They describe information-literate students in the medical field as those who require skills and knowledge inspired by influential attitudes to accomplish the ultimate goal of medical education which aims at successful application and implementation of medical information in the clinical setting. PBLs, EBM and doing research projects are the best opportunities for medical students to learn IL in the context of phase (III). However, IL development was significantly hindered as there were no new IL educational courses. Furthermore, time pressure is a hindrance because it forces students to spend less time to search for more reliable information to achieve their academic tasks like PBL.

Chapter 7 Findings From Librarians

7.1. Introduction

This chapter presents the findings from a focus group discussion with six librarians affiliated with the Health Science Centre Library Administration (HSCL), Kuwait University (KU). They have different experiences and roles in teaching IL as shown in table (7-1). The findings are also triangulated with evidence from documents available on the library website. The structure of this section is as follows: the librarians' conceptions of IL, the characteristics of information-literate students in the medical field, and ILE at HSCL.

Participants	Gender	Length of experience of IL teaching	Proportion of role devoted to IL teaching
Lib3	Female	10 years	electronic resources specialist as well as giving individual and group IL teaching sessions for students and academic staff
Lib5	Female	7 years	
Lib1	Female	23 years	Supervision of IL learning in the library
Lib4	Female	3 years	working in training department to train the students IL skills
Lib2	Female	3 years	
Lib6	Female	2 years	

Table 7-1 Demographic details & IL teaching experiences of the librarians

7.2. The context of HSCL

The HSCL Administration aims to facilitate information flow supporting education, research, and patient care and to provide biomedical information services to health professionals and students throughout Kuwait and the Gulf region. It was founded to serve the five faculties of the Health Science Centre, as mentioned above. The Health Science Centre Library (HSCL) houses many items and provides a wide range of valuable sources, as shown in the following table (Kuwait University, 2020, pp. 137-139).

Periodicals	1776 Electronic journals
Reference Collection	containing encyclopaedias, dictionaries, directories, and indexes to provide quick, concise answers
Books	30278 book volumes
Audio-visuals	collection of 2277, which includes video cassettes, slides, CD-ROMS, and other media
Databases	36 medical databases
Digital Collection	A collection of 2440 electronic books, 384 CD-ROMS English and Arabic, 87 DVDs, 42 Software, 237 audio cassettes, 1048 videos, 312 Slides, 125 Slide Cassettes, 28 Kits, 8 Transparencies, and 6 Laser Disks
HSC Publications	HSCL Administration has created a database with all the publications of HSC staff before and after its inception
Dissertations and Theses	HSCL Administration has maintained a Database of Dissertations and Theses of Health Sciences Centre staff and students.
Note: Not all electronic journal titles and databases were renewed during this academic year due to a limited budget.	

Table 7-2 Collections of Health Science Centre Library

HSCL offers various services that facilitate the effective use of information resources on campus and at remote sites. These services include acquisitions, cataloguing, circulation, reference and journals, automation and literature search, audiovisual materials, marketing resources, interlibrary loan, and training, outlined in the following points (Kuwait University, 2020, pp.139-141).

- Providing individual and group training sessions on library databases, online journals, eBooks, and other digital collections for HSC Faculty members, Students and other professionals in the medical field.
- Preparing hands-on practices and hand-outs for course-specific training sessions.
- Organising publisher training events on library databases.
- Preparing announcements and invitations to HSC Staff and Students for publisher training sessions.
- Instructing patrons on selecting bibliographic and full-text databases according to speciality.
- Instruct patrons on accessing library resources (on-campus and off-campus).
- Preparing library guides & tutorials.

7.3. Information literacy conception

The analysis of focus group discussion reveals that librarians demonstrate an understanding of IL meaning. Interestingly, they recognised that IL is conceptualised and experienced differently based on the nature of the discipline. Thus, as one interviewee argued:

“The way I see it is that the concept of information literacy depends largely upon the speciality. I mean that the concept varies according to the field of specialisation” (Lib6)

As a result, they define it in the medical field in two main categories: as core competencies and, from a more specific perspective, as critical thinking, as illustrated in Figure 7.1.

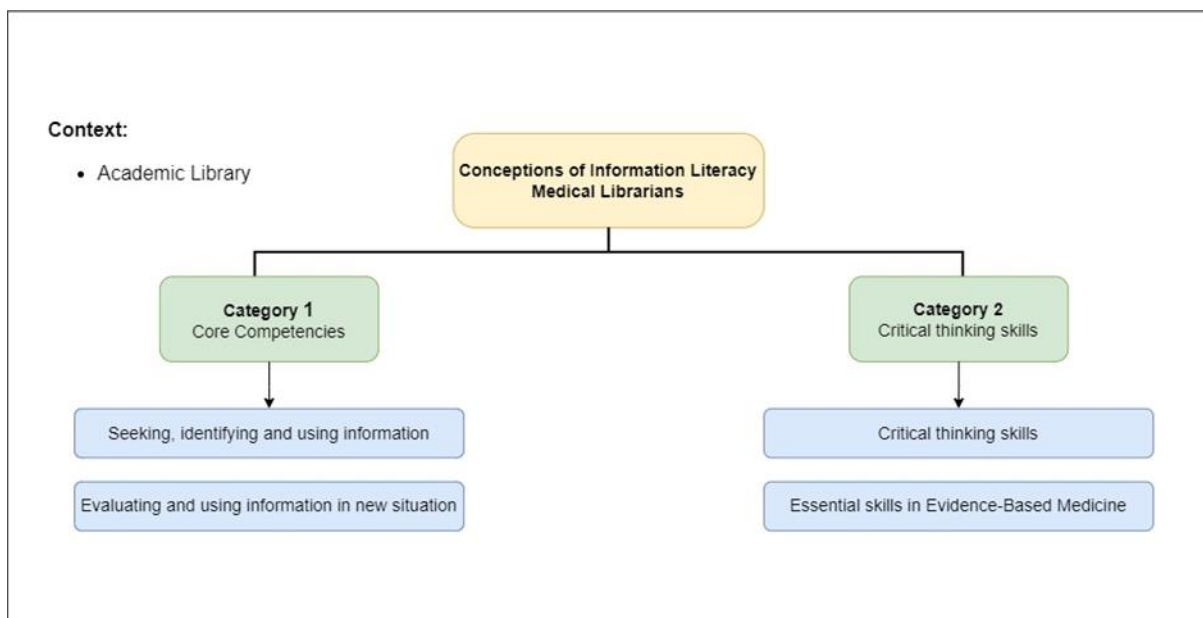


Figure 7-1 Conceptions of Information Literacy: Medical Librarians

7.3.1. Category (1): core competencies

Most participants conceptualise information literacy as the ability to locate, access, evaluate and use information with much focus on applying knowledge to make the best healthcare decision, which is the ultimate goal of medical discipline. For example,

“Information literacy is a process through which a student develops the ability to gather information and then assess the quality of that gathered information to be able to either use it for research purposes or present it to others” (Lib 4)

“Being information literate is being knowledgeable about how to gather, understand, analyse and use information in new situations” (Lib2)

7.3.2. Category (2): as critical thinking skills

The concept of IL is defined as critical thinking skills in the context of the medical academic library, which are an integral part of EBM:

“Some people call it critical thinking” (Lib3)

Therefore, IL skills are essential for a successful EBM approach in which medical students must critically appraise the evidence before applying it. Librarians indicate the importance of IL skills in such an approach, which is common in medicine:

“Of course, there are people who are specialised in this field [EBM], but if they do not possess information literacy skills, they will not be able to apply the EBM model” (Lib3)

7.4. The characteristics of information literate students in medical field

Librarians perceive that information-literate students in the medical field as those who possess a set of attributes. These involve three main aspects: knowledge, skills and attitudes, which are core elements to becoming an information-literate person in the medical field who can practise everyday medical activities, as shown in Figure 7.2.

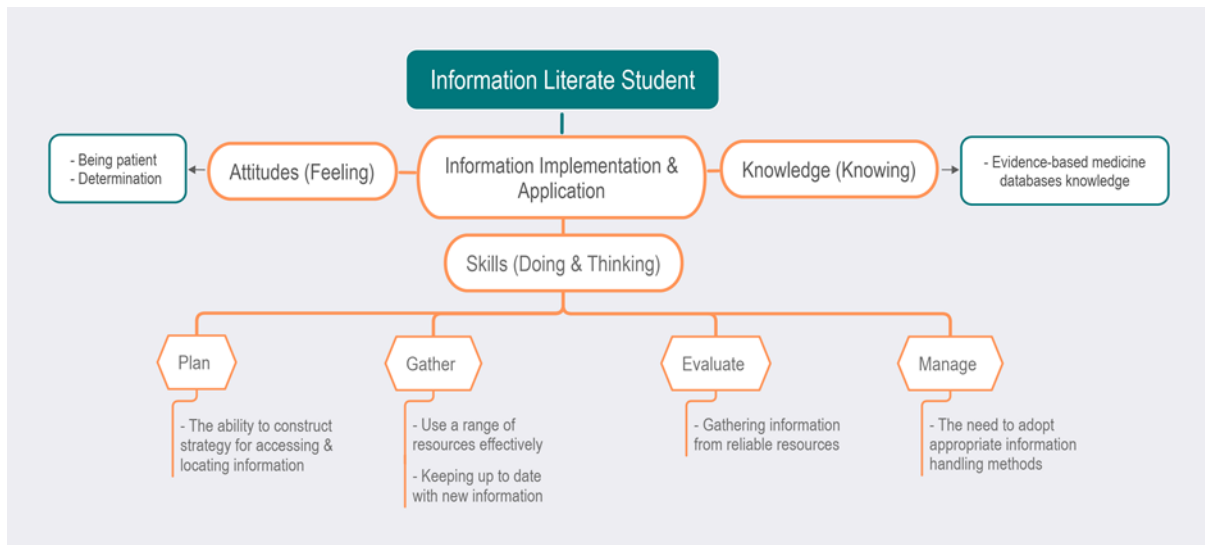


Figure 7-2 Characteristics of An Information Literate Student: Medical Librarians

7.4.1. knowledge

The analysis found that librarians identified that information literacy in the medical field requires knowledge. This knowledge is defined from a narrow perspective related to knowing the functions and structures of specific medical databases like EBM databases.

“That is why (EBM) is equally important in medical education...EBM database is almost like a pyramid where the base represents all the available information that a student can gather on a given topic, whether surgical or pharmaceutical and then it tapers gradually, going upwards by discarding irrelevant information until you get to the top, representing the best evidence. There is active criticism of the gathered information at every step until you get to the best evidence” (Lib3)

7.4.2. Skills

Librarians recognise several skills as a core ability to become information literate. These skills are as follows.

7.4.2.1. Plan

According to the participants, being information literate requires skills in constructing a sophisticated search strategy to retrieve the most relevant information. As one interviewee said:

“I think that they possess basic research-related skills. They know how to conduct internet searches and retrieve data effectively. They should also know the required techniques for data and information retrieval and how to use keywords to locate the appropriate articles” (Lib5)

7.4.2.2. Gather

Use a range of resources effectively

Most librarians recognise that medical students must gather their required information from multiple resources rather than be heavily dependent on single resources. By doing so, librarians believe that students can broaden their knowledge:

“Of course, medical students seeking to expand their knowledge must be prolific readers who are willing to diversify their reading material to include medical journals and academic articles and are keen to attend seminars and conferences in order to be able to enrich their knowledge” (Lib2)

Keeping up to date with new information

The discussion reveals that medical students must keep reading to keep abreast of the latest medical developments. As one interviewee said:

“I think that a medical student, unlike other students, must be a prolific reader in order to keep pace with the latest developments in the rapidly evolving field of medicine” (Lib3)

7.4.2.3. Evaluate

Gathering information from reliable resources

Librarians place much emphasis on the necessity that medical students must obtain their information from highly reliable sources. This attribute requires the students to assess the quality and credibility of the information resources found. It is recognised the need to gain information from peer-reviewed sources in medicine:

“I have something to add here, which is that information must be obtained from reliable sources, which students have to learn because many students regard Wikipedia, for example, as a reliable source of information, which is not from a medical perspective. That is why any article to be drawn upon in any research paper must be obtained from reliable sources or extracted from peer-reviewed journals” (Lib1)

Due to the importance of information source evaluation skills in the medical field, librarians mention that medical students in the first year are taught how to assess the credibility and accuracy of the medical websites available on the internet using certain criteria prior to gathering any information:

“We teach pre-med and first-year medical students not to visit just any website. They must first know the website's name and whether its information is intended for community awareness or is medically related. So, the students are taught that what they have to do first and foremost is verify the source of information, and this is done in pre-med” (Lib3)

7.4.2.4. Manage

The need to adopt appropriate information-handling methods

Medical information tends to be diverse and divergent, and much information from various directions bombards medical students. Thus, librarians recognise that medical students need to develop a database that helps them effectively manage their own collected information on specific topics. They believe this enables them to make strong correlations between different information and thus reflect positively on their clinical decision. As one interviewee stated:

“A student must establish his database regarding a particular disease, such as lung cancer. So, a student or a researcher must gather all related information about this topic and then try to establish links between the different parts of gathered information for subsequent use in diagnostic processes” (Lib 6)

7.4.3. Attitudes

The participants identify key attitudes as a significant aspect of being information literate in medicine.

7.4.3.1. Being patient

Librarians believe it is essential to be information literate in medicine, where the curriculum is intensive and time is limited due to numerical tasks. Lib4 stated that:

“A student must learn to have patience in order to make the transition successfully” (Lib4)

7.4.3.2. Determination

Librarians identify this attribute as being persistent in reading to build robust knowledge and exposure to more clinical cases. As one interviewee said:

“A medical student must be a persistent reader in order to be able to build his database, which is then expanded by seeing more patients in order to apply theoretical information in a practical/clinical context correctly” (Lib5)

7.4.4. Information implementation and application

Librarians indicate that the ability of practical applications and clinical practices in the clinical setting is the ultimate goal of being information literate within the context of medicine:

“I think the next step after acquiring such skills is to use them in an applied or clinical setting. I mean that the application of theoretical material in a practical context is what matters” (Lib4)

7.5. Information literacy education

This section presents the findings from the librarians’ focus group discussion supported by evidence from the official website of HSCL concerning the provision of ILE offered by the library. It also presents a set of perceived deficiencies about medical students from the angle

of librarians as well as the factors that affect ILE development. Figure 7.3 presents the overall picture of ILE in the HSCL.

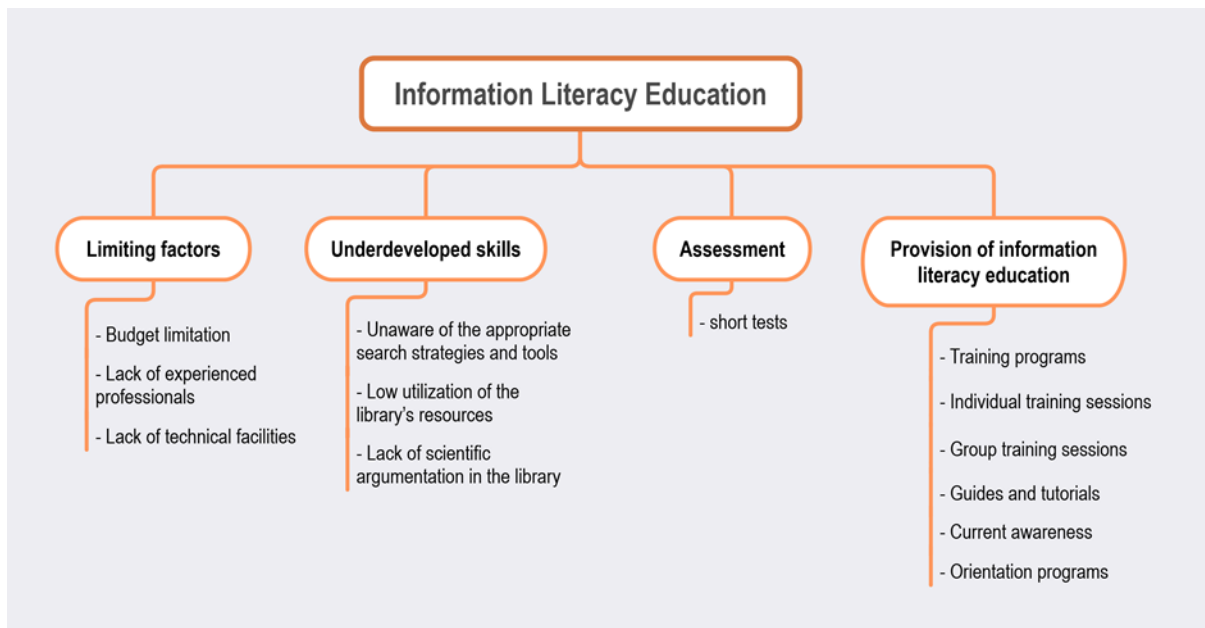


Figure 7-3 Information Literacy Education State: Medical Librarians

7.5.1. Provision of information literacy education

The focus group discussion plus the examination of the HSCL website reveal that HSCL promotes IL to medical students by incorporating instruction, consultation, training sessions, guided tours and orientation programs on HSCL resources. These are specially designed to teach the concepts and skills essential to medical students' needs to enable them to use the library resources effectively and become sufficient lifelong learners. These are as follows:

Training programs

Individual and group training sessions are offered throughout the academic year, from introductory sessions for first-year students to in-depth sessions for undergraduates, postgraduates, and academic and non-academic staff (Health Science Centre Library Administration [HSCLA], 2022).

Individual Training Sessions

In order to support the instructional needs of medical students and other healthcare professionals, HSCL offers individual sessions on a range of databases (e.g. Access Databases, BMJ Learning, Clinical Key, ISI Web of Science, Off-Campus Access, etc.) (HSCLA, 2022).

Group training sessions

HSCL also arranges formal sessions for searching databases and other electronic resources available in the library after submitting a formal letter to HSCL Administration (HSCLA, 2022).

Guides and Tutorials

Librarians develop user guides, video tutorials and other helpful material that support learning on library resources. They call it “LibTutor”, where many valuable materials like video tutorials and demos on, for example, navigating the HSCL homepage, searching the online catalogue, navigating online databases existing on the publisher sites, accessing library resources from a remote (off-campus) computer, and tutorials on using tools for formatting and managing citations like Mendeley software (HSCLA, 2022).

Current Awareness

HSCL promotes students' awareness by keeping them up with the latest news, events, and updates by following the library on social media websites such as Facebook, Twitter and Instagram (HSCLA, 2022).

Orientation programs

Librarians recognise that library orientation sessions usefully promote IL skills to students. These sessions are offered to first-year students in the first semester to familiarise them with the library resources and services. During orientation sessions, students are also trained on using OPAC and other subscribed bibliographic and full-text databases. For example, one of the librarians explains their role in the orientation session:

“I also explain to them the roles played by the different departments of the library, including functions and governing regulations. One of the key departments that we have here at the library is the training department, which organises one-on-one sessions, workshops, and seminars, where students are taught about databases and how, for example, to conduct database searches and how to find the required information in databases, whether general (all-specialisation inclusive) databases, as well as specialised databases, such as dental, internal medical, orthopaedic...etc.” (Lib4)

In addition, librarians realise how such sessions significantly reduce the students' anxiety as newcomers and successfully transition to the FOM setting. As one interviewee stated:

“First-year medical students usually experience this problem. However, having observed how this could be psychologically burdensome, we try to guide students through counselling sessions and workshops to successfully transition from the secondary school environment, where Arabic is the language of instruction, to the medical school environment, where English is the main language of communication. I can see that these sessions and workshops succeeded in bringing down the level of anxiety and fear experienced by students” (Lib3)

7.5.2. Assessment

The discussion reveals that librarians set a simple test informally during the orientation sessions to check what the students learnt from the intervention. This test takes practical forms. For example,

“First, we introduce them to databases, and then we give them exercises in order to see how much they understood what we taught” (Lib4)

“It is a simple test or a training exercise about, for example, how to develop a database search plan” (Lib2)

7.5.3. Underdeveloped skills

Based on their experience in the library, librarians realise several deficiencies that medical students need to improve. These are presented in the following sections.

Unaware of the appropriate search strategies and tools

Librarians claim that medical students are unaware of appropriate database search strategies. As a result, they heavily depend on limited search tools. This challenge is articulated through the following dialogue between interviewees:

“I think that students nowadays are not adept at database searches and need a lot of practice and training to master that skill” (Lib1)

“They are usually stuck on one database” (Lib3)

“They prefer to conduct searches exclusively on Scopus or up-to-date database” (Lib1)

According to the librarians, this problem is occasionally due to the factor of time pressure, as this statement indicated:

“For example, when a student comes up to me and says that he tried but could not get the required information, my first question is”, Did you select the right keyword?” and my second question is “; Did you go to the right database?” because not all databases answer all medical questions. My advice to them is to focus and limit the search and not be in such a hurry as to write lengthy sentences in the search box because this strategy will invariably get you zero results” (Lib3)

Low utilisation of the library's resources

Librarians realise that medical students do not fully exploit the library resources; instead, they use it as a place to study. As one interviewee stated:

“I always see students coming to the faculty library only for review and study purposes but not to use information resources” (Lib5)

Time constraints could be the main reason for their reluctance, as one participant claimed:

Interviewer: Why are students reluctant to use the library?

Interviewee: “I think the reason is that medical students are strapped for time since they have to work both morning and evening shifts and thus do not have enough time to do extracurricular searches (Lib5)

Lack of scientific argumentation in the library

Engaging in scholarly conversation is seen as a critical attribute to information-literate students in the medical field. However, librarians observed that medical students rarely participate in such active discussions deemed essential to open the way for new ideas to be formulated and debated. As one interviewee stated:

“Based upon my long experience at the faculty library, I can say that only a few students who come here engage in discussions. Most students that I see study on their own and scarcely discuss among themselves study-related topics, clinical cases or clinical situations that they encounter at the hospital” (Lib3)

7.5.4. Limiting factors

When asked about the factors that significantly impact the implementation of IL programs, Librarians explicitly identify a set of factors they believe are strongly related to students’ IL development. These are presented in the following sections.

Budget limitation

Librarians claim that lack of financial support significantly affects medical academic libraries because of the higher price of medical journal subscriptions and resources. This situation has become much worse after the Covid-19 pandemic. For instance, one participant said:

“We initially suffered from an insufficient budget because, under the Covid-19 pandemic, most financial resources were directed to the health sector, but now budgetary allocations have been increased because subscribing to the various databases is quite expensive (Lib1)

Lack of experienced professionals

As one librarian states, producing qualified medical librarians is not easy and cannot occur at short notice. Therefore, the shortage of experienced staff who can deliver IL instructions is one of the main factors that could affect IL provision in FOM:

“Another problem is that there are no experienced personnel. All experienced personnel who have worked for years to develop themselves professionally were forced to resign. Indeed, the fact that we formed a powerful work team where we cooperated towards developing training programs and organising info literacy workshops was ignored. The problem is that we do not have experienced personnel in this field, and it is tough to get the existing personnel who currently work in the medical field to develop the required experience over the short term quickly. This kind of experience is currently lacking here at this library, which is supposed to be a specialised medical library” (Lib3)

Lack of technical facilities

Librarians claim that the facilities of the computer lab cannot meet the number of students who are increasingly enrolled in FOM:

“The problem of space and place must also be considered, not to mention that the number of available computers is far from enough and many more computers are needed” (Lib5)

7.6. Summary

Medical librarians have defined IL in two categories: (1) core competencies and (2) critical thinking skills, which are shaped in the context of the medical academic library. They describe information-literate students in the medical field as those who require specific knowledge and need several skills and positive personal attitudes towards their learning, including patience and determination, to reach the final aim of practical application. The analysis reveals that there are very limited IL teaching activities offered to medical students by the medical librarians. These are mainly around library tours and developing some abilities regarding constructing appropriate search strategies in OPAC and some databases. These skills are taught through orientation programs delivered to phase (I) medical students in the first semester of the first year. The librarians demonstrate that they have no authority to design formal assessment tools, but instead, they test students' IL understanding through informal practical exams during orientation sessions. Several factors impact the development and execution of IL programs and students' abilities, including financial constraints, lack of qualified personnel and shortage of technological equipment.

Chapter 8 Findings From Medical Academics

8.1. Introduction

This chapter presents the findings from semi-structured interviews with medical academics supported by evidence from related documents' analysis. It is structured based on the concepts of IL in the medical field, the attributes of information-literate medical students, and the state of IL instructional practices within the context of FOM at KU.

8.2. Information literacy conception

From the analysis of transcripts, medical academics defined IL in the medical field from three perspectives. Figure 8.1 illustrates academics' conceptualisations of IL, which are subsumed under three key categories: core components of IL, high-order cognitive and critical thinking skills and taking clinical decisions in a humanitarian way. These findings are discussed in the following sections.

Context:

- Problem-Based learning
- Biomedical setting
- Academic Study

Conceptions of Information Literacy Medical Academics

Category 1 Core competencies

Evaluating & Using
information in new
situation

Seeking, identifying &
using information

Using technology to be
up to date

Being visual learner

Category 2 Higher-order cognitive and critical thinking skills

The possession of critical
thinking skills

Caution in accepting
medical information

Critical engagement with
medical information

Category 3 Taking clinical decision in a humanitarian way

Analysing clinical
information & formulating
hypothesis to reach
critical diagnosis in
humanitarian way

Figure 8-1 Conceptions of Information Literacy: Medical Academics

8.2.1. Category (1): core competencies

- *evaluating and using the information in new situations*

Several faculty participants believe that there are significant commonalities between IL conceptions used in the medical field, and those that are defined and rooted in IL literature where they tend to play the same role and aim to achieve a similar purpose. Therefore, they conceive information-literate students as those who should have skills to seek, identify, evaluate, use and apply information effectively and efficiently in new situations. For instance, one interviewee argued that:

“I also believe that there is no difference between the skill set that can be used in the medical field and that used in other fields, as information literacy serves the same purpose and ultimately aims at how to find, analyse and evaluate information and then properly use such information to make the correct medical decisions in treating patients” (MA6)

- *seeking, identifying and using information*

Findings also supported understanding of IL concepts concentrated on exploring, locating and using information. One informant reported that

“Information literacy entails three key components: first, the ability to identify the required information within one's field; second, the skill to seek out this information effectively; and third, the proficiency to employ and leverage this information effectively.” (MA9)

- *using technology to be up-to-date*

Another understanding of IL conception focused on the necessity of possessing technological knowledge. Hence, information-literate students are also seen as individuals who should demonstrate an awareness of using technology to be up to date with the latest medical developments:

“In medicine, information literacy pertains to the imperative for students and educators to possess proficiency in information technology. It is no longer acceptable to claim unfamiliarity with internet usage or the ability to conduct literature searches. Timely access to online resources is indispensable, and individuals in the medical field should be adept in these essential skills.” (MA10)

Due to the current technological development of information storage and retrieval, much emphasis is placed on medical students to be updated with ongoing medical knowledge and to make effective use of online subscription databases and resources available through formal information channels and library portals:

“Access to an abundance of information at one's fingertips underscores the importance of staying informed and up-to-date in the medical field. Ignorance of the latest developments is no longer acceptable, given the wealth of resources

available, including extensive databases containing books, journals, and comprehensive knowledge. Being well-informed and continuously updated with the latest advancements is a fundamental requirement for medical professionals and students alike.” (MA17)

- *Being a visual learner*

It was also further reported that information-literate students in the medical field need to master and develop visual learning skills to be able to handle a vast amount of medical information in a tiny conceptual mind map or picture:

“The interviewee's remarks highlight the learning preferences of individuals who lean towards visual learning. These learners are more likely to engage with and retain information when presented using visual aids such as pictures and illustrations. Moreover, they emphasise diagrams' effectiveness, which can succinctly convey complex concepts with minimal accompanying text. An illustrative example is offered concerning the teaching of diseases, particularly symptoms. Creating a well-organised and comprehensive visual representation of the disease's symptoms is advocated in this context. This approach consolidates information and enhances the learning experience for visual learners, enabling them to grasp and remember the material more effectively.” (MA1)

8.2.2. Category (2): higher-order cognitive and critical thinking skills

- *The possession of critical thinking skills*

The analysis also revealed another IL concept that emphasised critical evaluation and engagement with medical information, enabling medical students to read and understand information and practise critical judgment while interacting with medical information. This was an understanding of IL contingent upon the baseline skills mentioned above in category (1), considered essential prerequisites for medical students to reach this stage to comprehensively and critically engage in a participatory learning environment that promotes producing medical information alongside information consumption. For instance, one interviewee explained the concept of IL as follows:

“Advanced medical information literacy is not just about receiving and memorising information. It's also about reviewing, critiquing, and discarding information when necessary. This approach acknowledges the existence of grey areas where critical thinking is essential. Healthcare professionals should develop the skills to evaluate information's credibility and relevance, engage in discussions, and navigate medical complexities. The goal is active engagement, not just passive information absorption, to make informed decisions and provide the best patient care.”(MA11)

Another participant confirmed this statement by providing further insight into the cognitive understanding that medical students need to demonstrate through their academic achievement. IL was seen as a construct of higher-order thinking competencies that medical students need to

employ in their daily lives and go beyond information discovery to be able to work for critically analysing and challenging medical information.

“Fostering critical thinking skills is imperative for medical students. In an era where information is readily accessible, it's not just about obtaining data, but also the ability to process, analyse, and critically assess that information. This capacity for critical evaluation is a fundamental aspect of medical education, enabling students to develop a deeper understanding of complex topics and make informed judgments in their future medical practice.” (MA18)

- *Caution in accepting medical information*

Thus, medical students will gradually adopt positive attitudes of being careful when accepting medical facts and information. Therefore, it is emphasised that information-literate learners within the medical field should be cautious in taking and questioning medical information even if it is presented as factual information:

“When seeking and acquiring information, it is imperative not to assume its veracity or accuracy, as critical inquiry and analysis are essential components of responsible information consumption. Even when encountering information within a particular source, such as a book, one should refrain from unquestionably accepting it and instead engage in a rigorous process of critique and evaluation. This approach fosters a deeper understanding of the information's significance, reliability, and implications within the broader context of the subject matter under consideration.” (MA9)

- *Critical engagement with medical information*

From a slightly different angle, information-literate students are conceived as those who possess and develop critical thinking skills. Some interviewees argued that the possession of critical thinking skills is necessary for skilful medical students or physicians who are capable of making judgments within highly complex medical information environments from others:

“Success within the medical profession cannot be exclusively attributed to the possession of a medical degree, for not every medical doctor achieves the pinnacle of success. However, I contend that what distinguishes a successful doctor from the rest of their peers is their possession of essential skills, notably critical thinking and information literacy skills. These proficiencies empower medical professionals to navigate the ever-changing healthcare landscape, enabling them to make informed decisions, adapt to emerging medical knowledge, and provide optimal patient care.” (MA14)

“Critical thinking holds an exceptionally pivotal role, especially in medicine. It serves as a distinguishing factor between a proficient healthcare practitioner and a subpar one. This is because a skilled and competent doctor consistently approaches medical challenges comprehensively, considering the entire problem and exploring a multitude of potential solutions or diagnoses. In doing

so, they mitigate the risk of overlooking critical details and optimise their ability to provide their patients the highest standard of care.” (MA15)

This view was echoed by another informant who recognised that medical students need to be critical thinkers, particularly when weighing medical evidence and making careful judgments of different perspectives in the medical field:

“The primary rationale for cultivating information literacy in medical students lies in their capacity to effectively comprehend and adapt to the ongoing advancements within the medical field. Additionally, possessing robust critical thinking skills enables them to evaluate contrasting perspectives, particularly when addressing critical issues like the public discourse on the COVID-19 vaccine through social media platforms such as X (formerly Twitter). The medical community exhibits division on this topic, with proponents and opponents providing scientific evidence to substantiate their positions. In light of these circumstances, medical students bear a moral responsibility to scrutinise these viewpoints, relying on information gleaned from reputable sources, such as academic papers, to make informed and ethical judgments.” (MA8)

8.2.3. Category (3): making clinical decisions in a humanitarian way

- *Analysing clinical and formulating hypotheses to reach a critical diagnosis in a humanitarian way*

Some academics defined IL from a more focused perspective in a clinical setting as the ability to analyse clinical data to formulate hypotheses to reach critical diagnosis while considering humanitarian aspects while processing clinical data and information. IL can be appropriated or interpreted as a medical term that extends beyond the HE context to encompass clinical settings. IL, from a clinical perspective, is defined as:

“The distinction I draw in the medical realm is that while analysis is prominent, synthesis takes a backseat. In medicine, the objective isn't to generate new information; rather, it involves formulating hypotheses, drawing conclusions, and making diagnoses. Moreover, humanitarianism plays a pivotal role in differentiating medicine from pure science. In scientific endeavours, a rigorous and unwavering pursuit of facts is the norm, devoid of the humanitarian considerations intrinsic to the practice of medicine”. (MA11)

Another statement confirmed the view of human touch availability in the conceptions of IL in the medical field:

“The significance of the human aspect in medicine cannot be overstated. When considering a candidate aspiring to become a physician, assessing their capacity for empathy and compassionate care is paramount. The essence of medical treatment is compromised without a genuine dedication to the role of a healer and servant to humanity. Medicine's core mission is to alleviate suffering, whether physical, emotional, or societal. Therefore, a strong commitment to the

humanitarian aspect is indispensable in medicine, and its absence can undermine the very purpose of healthcare.” (MA15)

8.3. The characteristics of information literate students in the medical field

Medical academics perceive that medical students should possess diverse knowledge and skills underpinned by several positive attitudes and values to achieve practical application within the clinical setting. Figure 8.2 provides a holistic illustration of the critical characteristics of information literate students in the medical context that emerged from the findings of medical academics’ semi-structured interview analysis. It also demonstrates a synergic relationship among all these attributes and how they are related.

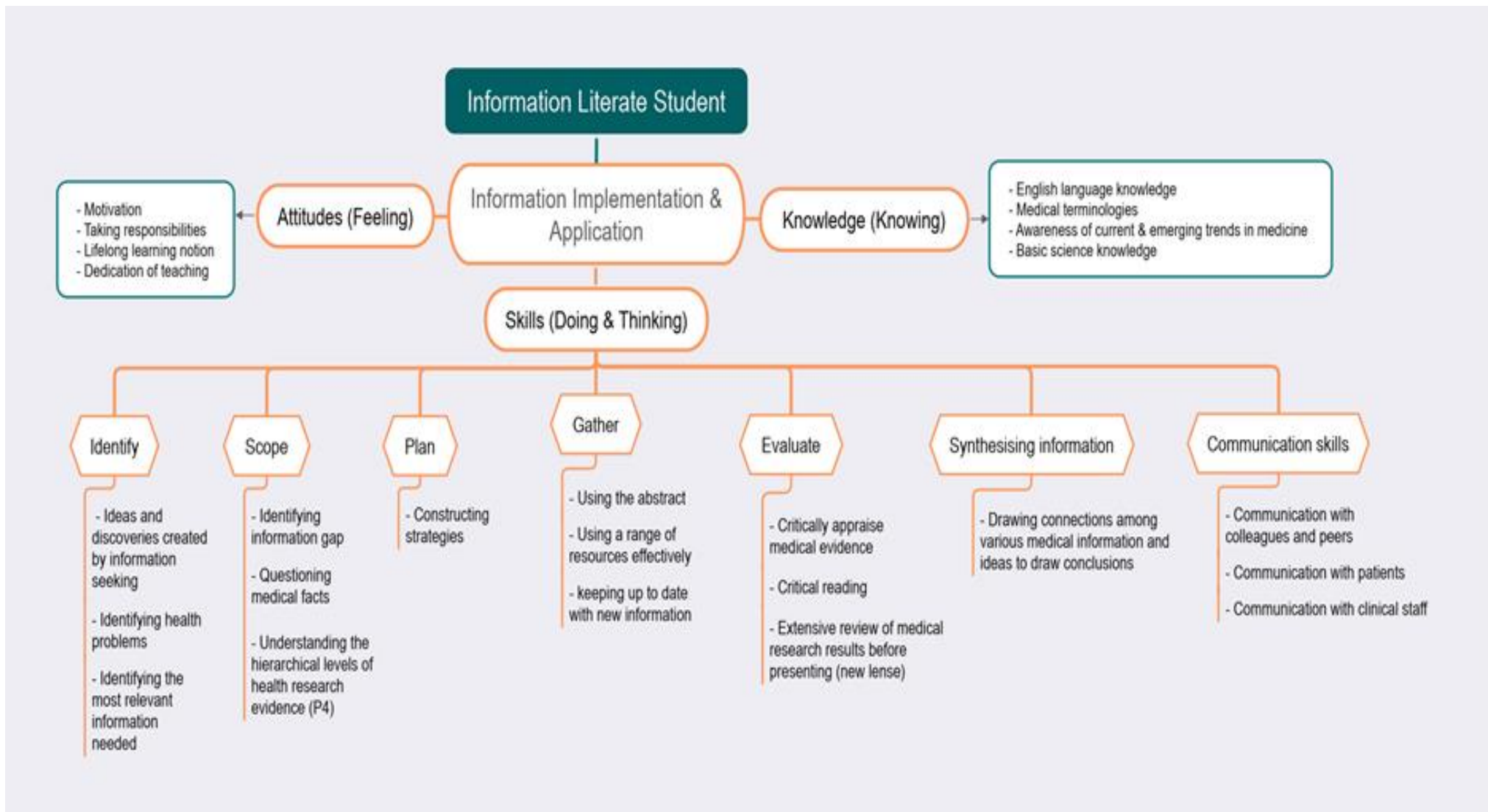


Figure 8-2 Characteristics of an Information Literate Student: Medical Academics

Based on the data analysis, medical academics perceived that three key components, including knowledge, skills and attitudes, constitute information-literate students in the context of medicine to accomplish the overall aim of practical application. Several diverse sub-components are derived from each of the key ones. For instance, being information literate medical students requires much relevant and specialised knowledge pointed out by medical lecturers, including:

- English language knowledge
- Mastering medical terminologies
- Awareness of current and emerging trends in medicine
- Basic science knowledge

Further, medical academics identified core skills that medical students need to develop to succeed in their professional and academic careers. These skills are indicated as the ability to

- identify the information needed (Identify)
- assess the current knowledge and identify gaps (Scope)
- construct strategies for locating information and data (Plan)
- locate and access the information and data they need (Gather)
- evaluate information and data (Evaluate)
- Synthesising information to create new knowledge or clinical conclusions (Synthesise)
- The ability to communicate orally and non-orally with students, academics, patients and other healthcare professionals, as well as to present information and research findings to others (Interpersonal skills)

They also placed much emphasis on several critical attitudes medical students should possess, which are:

- Motivation (wanting to learn)
- Taking responsibility for their learning
- Believing in lifelong learning notion in the medical field
- Dedication of teaching and learning each other

8.3.1. Knowledge

8.3.1.1. English language knowledge

English language was seen as a fundamental dimension that medical students need to acquire. This is because it is the language of instruction in the FOM and English is used in everyday communication in a clinical setting. One participant pointed out that:

“The language of instruction, predominantly English, plays a pivotal role in the Health Sciences Centre (HSC) educational landscape. Medical students are expected to possess a proficient command of the English language and to delve further into acquiring medical terminologies, which constitute a specialised subset of the language. This undertaking necessitates a heightened commitment and effort, as medical terminologies are intricate and unique, demanding a more intensive focus to excel in the medical field.” (MA5)

8.3.1.2. Mastering medical terminologies

From a slightly different perspective, another informant shed some favourable light on the importance of acquiring medical terminologies, which play a vital role in their daily clinical practices. Terminological knowledge can also positively reflect on their communication as teamwork when they intend to go abroad to complete their higher educational degree:

“Reading serves a dual purpose for medical students—it enhances their knowledge and contributes significantly to developing their medical vocabulary. Proficiency in medical terminology is a fundamental aspect of medical practice, particularly as it facilitates effective communication and collaboration within a medical team. When medical students can converse efficiently using medical terminology, it instils confidence in them, enabling them to engage effectively with superiors and colleagues during fellowships and ultimately perform at their best.” (MA17)

8.3.1.3. Awareness of current and emerging trends in medicine

New trends are continuously and rapidly emerging in medicine. Therefore, medical students must be aware of these new developments and trends. One participant asserted the importance of having IL skills in following these trends and supporting such knowledge:

“Future medical students should possess a heightened awareness of bioinformatics and exhibit proficiency in navigating extensive databases to extract essential data. Additionally, they must demonstrate competence in utilising contemporary data search technologies. For instance, when diagnosing a patient's genetic disorder, a medical student should be well-versed in accessing specialised programs, such as those available at the University of Arizona in the United States. Moreover, they should be adept at translating their theoretical knowledge into practical experiments, thereby gaining insights into enzyme functionality and the underlying causes of enzymatic disorders. This multidisciplinary skill set is essential for staying at the forefront of medical research and diagnostics in an increasingly data-driven healthcare landscape.” (MA7)

Another interviewee echoed a similar idea of how medical students should be acquainted with so-called precision medicine in which IL skills also play a significant part:

“A fundamental competency for any future medical student is translating research findings and acquired information into practical applications within medical practice and diagnostic medicine. This capacity is crucial for making well-informed and precise decisions when diagnosing and treating patients. Ultimately, the goal is to harness the power of information and research to deliver personalised and effective healthcare, often called precision medicine. By understanding how to apply knowledge and tailor treatments to individual patient needs, medical students can aspire to become proficient and compassionate medical practitioners.” (MA6)

8.3.1.4. Basic science knowledge

The majority of participants recognised how the acquisition of basic science knowledge can make a difference to medical students, whether at the level of clinical practice or at the PBL class level, where it is essential to students' interaction and participation and to contribute to achieving PBL objectives:

“A robust educational background is a cornerstone in the realm of medicine. It serves as an indispensable foundation for problem identification and resolution. An adept physician can trace issues to their origins or fundamental roots, often grounded in the core principles of anatomy, physiology, or biochemistry. This solid background empowers healthcare professionals to gain a deeper and more comprehensive understanding of the issues they encounter, ultimately enhancing their ability to diagnose and address medical problems with greater precision and effectiveness.” (MA15)

“While comprehensive expertise is not necessarily anticipated from medical students, a foundational understanding of a particular subject is imperative for productive Problem-Based Learning (PBL) sessions. In the context of PBL, a basic minimum knowledge level within the relevant topic is essential to ensure that these educational sessions yield meaningful outcomes. This prerequisite knowledge enables active participation and fosters the achievement of the intended goals of PBL, which primarily involve critical thinking, collaborative problem-solving, and the application of medical knowledge in a practical context. Without this fundamental grounding, the objectives of PBL may remain unattainable.” (MA17)

8.3.2. Skills

Interviewed medical academics identified a wide range of skills and abilities that help determine the shape of information-literate students in the context of the medical field. These will be outlined in the following sections.

8.3.2.1. Identify

Several medical academics recognised that medical students should be able to identify the information needed to be used in doing a range of academic tasks like PBL or in determining medical problems within a clinical setting.

Identifying the most relevant information needed

It was recognised that medical students need to be more focused to determine the most relevant and required information from enormous medical literature scattered in a wide range of databases or formal information medical channels to accomplish their weekly PBL tasks:

“The paramount priority in the educational context is for students to maintain their focus on the case at hand. To do so effectively, they must remain attentive and adept at extracting pertinent information from diverse sources, including

platforms like PubMed. This ability to concentrate on the case while skilfully gathering relevant information is pivotal for successfully pursuing medical knowledge and problem-solving in the field.” (MA13)

Ideas and discoveries are created by information-seeking

Much emphasis was placed on the necessity that medical students need to search for information themselves through which they can build robust backgrounds and figure out new things:

“For medical students to cultivate a comprehensive and varied knowledge base, it is essential that they actively engage in the process of seeking out information to meet their specific informational needs. This self-driven approach to research is an ideal learning method and a pathway through which they may stumble upon previously undiscovered insights and knowledge. By seeking out information independently, students not only bolster their existing understanding but also contribute to expanding medical knowledge by potentially uncovering new findings or perspectives.” (MA7)

Identifying health problems

Identifying a research question and recognising a need for information associated with clinical situations depend primarily on defining patient problems. Hence, one interviewee stated that the identification of health problems constitutes a departure point for physicians or medical students to identify their information need to solve the patient problems and queries in the clinic:

“In medicine, gathering information begins with the initial interaction when a patient enters the clinic. This interaction often involves something as fundamental as eye contact, establishing a vital connection between the healthcare provider and the patient. Subsequently, the healthcare provider proceeds to acquire further information, including knowledge about the patient's medical history, symptoms, and existing health conditions. This comprehensive information gathering is instrumental in the diagnostic and treatment processes, as it forms the basis for informed medical decisions and the delivery of optimal patient care.” (MA15)

8.3.2.2. *Scope*

Assessing current medical knowledge is required to be carried out by medical students to stay updated and to identify any information gaps. Therefore, one participant argued that medical information is boundless, and there is still a shortage in our knowledge:

“The vast and ever-expanding body of knowledge in the medical field means that no individual, regardless of their expertise, can encompass all medical knowledge. Recognising the limitations of one's knowledge is essential, as it fosters a sense of humility and a willingness to continually learn and adapt in the face of discoveries and evolving medical practices. In medicine, pursuing knowledge is a lifelong journey, and acknowledging that there is always more

to learn is crucial to professional growth and providing the best possible care to patients.” (MA4)

However, several respondents indicated the skills of assessing medical knowledge in two domains:

Assessing current understanding to identify the gap

One interviewee illustrated the significance of identifying information gaps within the context of PBL class when asked what the most significant aspect of IL is to medical students:

“One of the primary tasks for medical students, especially in problem-based learning (PBL) sessions, is to define and identify the scope of the problem effectively. This involves assessing existing knowledge and pinpointing gaps or areas where more information is needed. By clearly identifying the problem at the outset, students can embark on a systematic and informed process of gathering pertinent information and generating insights to address the issue comprehensively. This approach enhances their critical thinking skills and equips them with the tools necessary for effective problem-solving in medical practice.” (MA15)

The ability to question the validity of medical facts

Another interviewee alluded to assessing medical knowledge by encouraging medical students to continually raise critical questions of medical information even if it is definite facts with the aim of checking its reliability and validity of medical facts. Raising such questions may result in identifying the knowledge gap and thus formulating new research questions:

“Encouraging students to ask questions, even about established medical facts, is a valuable approach in education. Questioning fosters a deeper understanding of the subject matter and cultivates critical thinking skills. It can lead to insightful inquiries that challenge existing knowledge, potentially uncovering new perspectives or solutions.” (MA9)

Understanding the hierarchical levels of health research evidence

There is a diverse range of research methods used in the medical field. Therefore, understanding these types is a critical competence for medical students. One interviewee stated that lists of this evidence derived from the above different types of methodological research are ranked by their usefulness and strength. Thus, medical students need to identify these scientific methods to make their decision based on evidence:

“Medical students should grasp the primary research study types, like randomised control trials and cohort studies, and discern the strength of evidence they offer. This knowledge enables them to make evidence-based decisions in future research and clinical practice.” (MA4)

8.3.2.3. Plan

Medical academics indicated that the ability to access information needed is an essential component of IL for students. They require such skills to construct search strategies to locate potential information sources, which can be taught through workshops and sessions administered by the library. For instance, as reported that:

“Effective database searching and keyword selection are essential skills for students. These skills can be imparted through dedicated courses and workshops conducted by the library.” (MA4)

Medical academics also mention the ability to construct strategies for locating information and data. They require medical students to know how to seek particular medical information while making their search plans. Different search strategies involving using filtering techniques to limit search results or prioritising methods to gather information for PBL class were highlighted:

“In such situations, applying inclusion and exclusion criteria becomes crucial. These criteria help filter studies based on your requirements, allowing you to include or exclude particular study types, like excluding single-subject designs and including only randomised control trials, to refine your research focus.” (MA4)

“Creating a structured list outlining the types of information to search for is a recommended approach. For instance, if the objective is to study the heart, students should categorise their search criteria, such as physiology, pathology, pharmacology, and other relevant aspects, to ensure comprehensive and organised research.” (MA16)

8.3.2.4. Gather

There are several methods identified by medical academics that medical students can utilise to locate and access the information sources they need. These include:

Keeping up to date with new medical information

The majority of participants agreed that keeping ongoing reading is an effective method that medical students need to practise to either stay updated with what is going on or to extend their medical knowledge:

“Medical students should engage in extensive reading, given the inherent complexity of the human body. Staying updated is essential, particularly in rapidly evolving fields like medicine. For instance, in the context of COVID-19, medical students should regularly review the latest research and studies to remain informed about the most recent developments in this area.” (MA8)

The use of the abstract

Having constructed strategies for access to information sources, it was stated that reading the abstract seems to be an appropriate way to select the most relevant paper or study to the research topic:

“In reviewing research literature, a common strategy is to start by reading the abstracts of relevant papers. This allows researchers, including medical students, to quickly gauge the relevance of a study to their research objectives. Once a paper's abstract aligns with their needs, they read the full paper for a more comprehensive understanding of the research findings and methodologies.” (MA4)

Using a range of resources effectively

This theme was not explicitly discussed as IL characteristics, yet it was mentioned as difficulties faced by medical students in two aspects. Regarding the context of PBL class, medical academics indicated that students, particularly those in the preclinical phase, heavily rely on limited sources and usually only one source for gathering their required information to do PBL. For instance, one interviewee noted that:

“Students should avoid relying solely on lecture notes, Wikipedia, or Google for information gathering. To expand knowledge effectively, especially in problem-based learning, it's essential to use a more systematic and critical approach, including peer-reviewed sources and scholarly literature.” (MA17)

High reliance on a few sources while gathering the information needed from the standard search engines was attributed to low IL skills.

“First-year medical students often encounter challenges locating credible information due to limited information literacy (IL) skills. In contrast, more advanced students from the first through fourth years may heavily rely on Google Search Engine as they've developed their information retrieval skills over time.” (MA6)

8.3.2.5 Evaluate

Critically appraise medical evidence

Medical academics describe this attribute as students' ability to appraise various medical evidence critically. They require medical students to be able to assess the strength of the evidence used in the medical research when searching for information to use in their practices or research:

“Critically analysing evidence is of utmost importance in the medical field. Due to the pervasive nature of evidence in this field, medical students and healthcare professionals must possess the skills to assess the quality of evidence in well-published studies.” (MA4)

Critically reading

In addition, much emphasis is also placed on the importance of critical reading to evaluate the weight of medical evidence as well as to understand deeply:

“Reading is the cornerstone of critical thinking, extending beyond mere entertainment. As educators, our responsibility is to inspire students to evaluate and analyse the content they read. Encouraging students to read and comprehend what they read is fundamental to cultivating critical thinking skills.” (MA2)

Extensive review of medical research results

Medical research findings should be carefully reviewed before the implementation and publication phases:

“In the medical field, it is crucial for students and researchers to conduct thorough reviews before the final phase of research, especially before publishing their findings or applying them in clinical practice. This in-depth review stage should precede or be integrated into the final phase, particularly when new research contradicts existing findings from studies conducted years ago. This meticulous approach ensures the reliability and validity of new medical research findings before dissemination and practical implementation.” (MA3)

8.3.2.6. Synthesising information

Drawing connections among various medical information

Some interviewees identified this skill as the ability to draw logical connections among numerous kinds of medical knowledge and ideas from a wide range of sources to understand how they are related to each other:

“Connecting different pieces of information is a fundamental skill in medicine and healthcare. Students should focus on acquiring this skill” (MA18)

This view was echoed by another participant who placed much emphasis on IL in developing such an ability:

“Medical information is vast and diverse, and the ability to draw meaningful connections between various pieces of information is paramount. Information literacy skills play a pivotal role in enabling students to navigate this complexity effectively. These skills empower students to access and understand information and synthesise and relate different strands of medical knowledge, facilitating a comprehensive and coherent understanding of the field. This interconnectedness of information is vital for making informed clinical decisions and advancing medical research” (MA9)

Concerning PBL and clinical settings, medical academics also expected students to consider all diagnostic possibilities and ideas from various resources and finally make optimal solutions to the problem:

“We want medical students to think of all the options rather than reaching a specific diagnosis” (MA18)

“Physiology students need to learn how to integrate all the information about body systems” (MA16)

8.3.2.7. Communication skills

The majority of academics explain and understand this attribute from both academic and clinical settings, which involves several abilities and skills. Almost all interviewed medical academics agreed that students must develop and apply interpersonal and communication skills at various levels. These include:

Communication with colleagues and peers

It was observed that the interaction among students is shallow, particularly within the context of PBL class:

“Effective communication skills are critical in medicine, especially within the Problem-Based Learning (PBL) environment. Medical students must communicate clearly and collaborate with their peers to address complex cases and exchange ideas. By fostering strong communication skills, medical students excel in the PBL setting and prepare themselves for the interpersonal challenges they will face in clinical practice, where effective communication is central to patient care and the healthcare team's success.” (MA18)

Hence, to achieve the maximum benefit of PBL, some informants called for encouraging discussion and interaction among students:

“Encouraging active interaction between students and instructors in a PBL module is a valuable practice that enhances learning outcomes and promotes collaborative problem-solving.” (MA9)

Communication with patients

Medical students are expected to deal with patients experiencing particular health conditions. Therefore, most medical academics identified this ability as a health communication skill that students must develop once they approach patients. One informant reported that:

“Skills acquired through practical experiences at the hospital, such as effective patient communication, case management, and displaying empathy while gathering information, hold greater significance than theoretical knowledge alone. This is because future doctors must excel in patient communication, a distinct skillset necessary for providing specialised care and understanding patients' unique needs.” (MA2)

Generally speaking, communication is concerned with listening as well as talking. Thus, some participants thought that taking patient history notes and health communication skills cannot be separable. They placed much emphasis on how students listen to the patients and ask the right questions to reach the correct diagnosis:

“One of the most crucial skills for a medical student to acquire is patient interaction, including the ability to take a comprehensive medical history and make diagnoses based on symptoms.” (MA8)

Communication with clinical staff

Some medical academics expect medical students to develop attributes beyond general IL skills, including working collaboratively with other healthcare professionals in workplaces once they move to clinical situations. They identified a literate person as one who can work effectively with other clinical staff and colleagues to promote understanding, manage differences and resolve conflicts:

“The relationship between doctors and nurses, as well as other healthcare professionals, should be one of equals and colleagues within the healthcare team. Doctors must recognise that they are part of a collaborative effort, and nurses play a crucial role in caregiving.” (MA11)

8.3.3. Attitudes

Several medical academics recognised attitudes and interests as crucial elements at the heart of information-literate students' characteristics in the medical field. These include:

8.3.3.1. Motivation (wanting to learn)

When asked about the most significant attribute of all information-literate students in the medical field, several participants were unanimous in the view that having self-motivation and personal passion were mentioned in the first place. Much emphasis was placed on the importance of love for learning in medicine. For example, as the MA18 interviewee put it,

“Probably you would wonder from the answer, but I think passion if the students have the passion, you know they would learn anything they want”

Another interviewee echoed a similar idea yet with much focus on possessing IL skills alongside the willingness for medical students to be independent learners to extend their knowledge beyond the curriculum:

“Fostering a passion for learning and a proactive approach to expanding one's knowledge beyond the curriculum are key attributes for success in medical education. Information literacy skills, especially in the medical field, are invaluable for students as they enable them to independently seek, evaluate, and apply information effectively, thus enhancing their learning and professional growth.” (MA5)

Moreover, there was a link identified between self-motivation and IL skills learning. One participant stated that students with less motivation would not put much effort into learning these skills, which are central to academic excellence in such a situation:

“Students may not initially recognise the importance of these skills, and external pressure alone may not effectively motivate them to learn. Instead, the true motivation for IL should come from an intrinsic understanding of its significance and a personal drive to acquire these skills. When students appreciate the importance of IL for their future careers and professional growth, they are more likely to invest effort into developing these skills voluntarily. It's a combination of awareness and self-motivation that can lead to meaningful skill development in the realm of IL.” (MA18)

Another statement focused on the importance of being an active learner and good listener, especially in the context of PBL class. It was stressed that medical students must pay much attention in a participatory learning environment considered central to learning IL skills.

“Active listening is a foundational skill in medical education, applicable across various teaching formats, including Problem-Based Learning (PBL). Effective participation in PBL sessions, which often involve open discussions and group interactions, hinges on students being attentive and engaged as active listeners. Not only does active listening facilitate the exchange of ideas and insights, but it also fosters collaborative problem-solving and the meaningful contribution of each team member. Encouraging students to recognise the importance of this skill can significantly enhance their learning experiences and outcomes in medical education.” (MA12)

8.3.3.2. Believing in lifelong learning notion in the medical field

It was argued that lifelong learning must be rooted in students' mentality because continuous learning is integral to medicine. By promoting such a notion, students would be motivated to seek information beyond the curriculum and develop information skills, a fundamental element in lifelong learning.

“The commitment to continuous learning is not confined to the first seven years of the undergraduate medical program; it extends from the very outset. Students should understand that medical education is an ongoing, cumulative process that demands a dedication to consistently acquiring and applying knowledge. This perspective ingrains a mindset of perpetual learning from the beginning, emphasising that medical education is not merely a set of courses to complete but rather a way of life.” (MA15)

8.3.3.3. Taking responsibilities for their learning

This attitude has arisen when one participant asked about the challenges facing medical students. The participant indicated that a wide range of distractions in Kuwaiti society could affect medical students' academic and learning track. Thus, it was stressed that medical students should have many responsibilities over their education.

“In Kuwait, the lifestyle and approach to medical education may sometimes pose challenges, particularly in taking the learning process seriously. Recognising the paramount importance of a dedicated and rigorous approach to learning in medical education is crucial. Encouraging students to prioritise their education, embrace a continuous learning mindset, and commit to the rigorous demands of the medical field can contribute significantly to their success and the quality of healthcare they provide in the future.” (MA12)

8.3.3.4. Dedication of teaching and learning each other

It was indicated that medical students must develop an attitude towards teaching and learning with each other with dedication. One respondent reported that they need to foster such critical habits being practised daily when they move to work in the hospital where senior teach junior and the latter learn from the former and vice versa:

“They want to teach their colleagues with honesty and dedication..., in the future, as future physicians, okay, when they go to the clinic, that's what they must do. They have to learn and teach at the same time as teaching colleagues. The seniors teach the juniors...” (MA15)

8.3.4. Information implementation and application

Some interviewees indicated that applying medical knowledge and the ability to use information is at the heart of being information-literate students in the healthcare setting. This means they need to have some knowledge and skills to perform the procedures on actual patients after graduation or during medical school. As one participant put it:

“I believe that practice, for example, is one of the key missing factors because to practise the medical profession, a medical student needs a solid practical background in subjects like anatomy, where precise knowledge of the various organs and components of the human body is essential, particularly for third phase medical students and upwards” (MA7)

It was also realised that the acquisition of medical knowledge is not enough unless it is translated into or transformed into practical reality, stating that:

“It is not enough for physicians and medical students to possess knowledge; effectively applying that knowledge in practical situations is paramount. Bridging the gap between theoretical understanding and practical application is essential for delivering high-quality patient care and ensuring that medical knowledge translates into positive outcomes.” (MA15)

Thus, one interviewee suggested that healthcare professionals need more skills to apply medical information and knowledge to patients in their daily clinical practices. Therefore, it was put forward that:

“It's a valid point to consider using "implement" instead of "present" when referring to skills in a clinical setting. In a clinical context, the focus is indeed on implementing knowledge and evidence directly in patient care. Using

"implement" can accurately reflect the practical application of skills in a healthcare environment." (MA4)

Another informant explicitly pointed out that performing practical procedures or practical applications is the ultimate goal of medical education, where gaining knowledge and information is a necessary precondition for putting these into practice:

"Practical application of knowledge is vital in education, especially in fields like medicine. It's not just about learning but understanding how to apply knowledge in real-life situations, particularly in clinical practice." (MA18)

8.4. Information literacy education

This section provides a detailed overview of findings related to the current state of information literacy education (ILE) within the context of FOM at KU. The status of ILE is discussed from many key aspects as follows: medical academics' perceptions of IL pedagogy, pedagogical approaches used to engage students in IL, types of assessments used in assessing IL learning outcomes, academics' perceptions of students' problems and factors affecting the development of students' IL competencies. These are discussed in the following subsections, presented in a pretty different sequence from Figure 8.3 below.

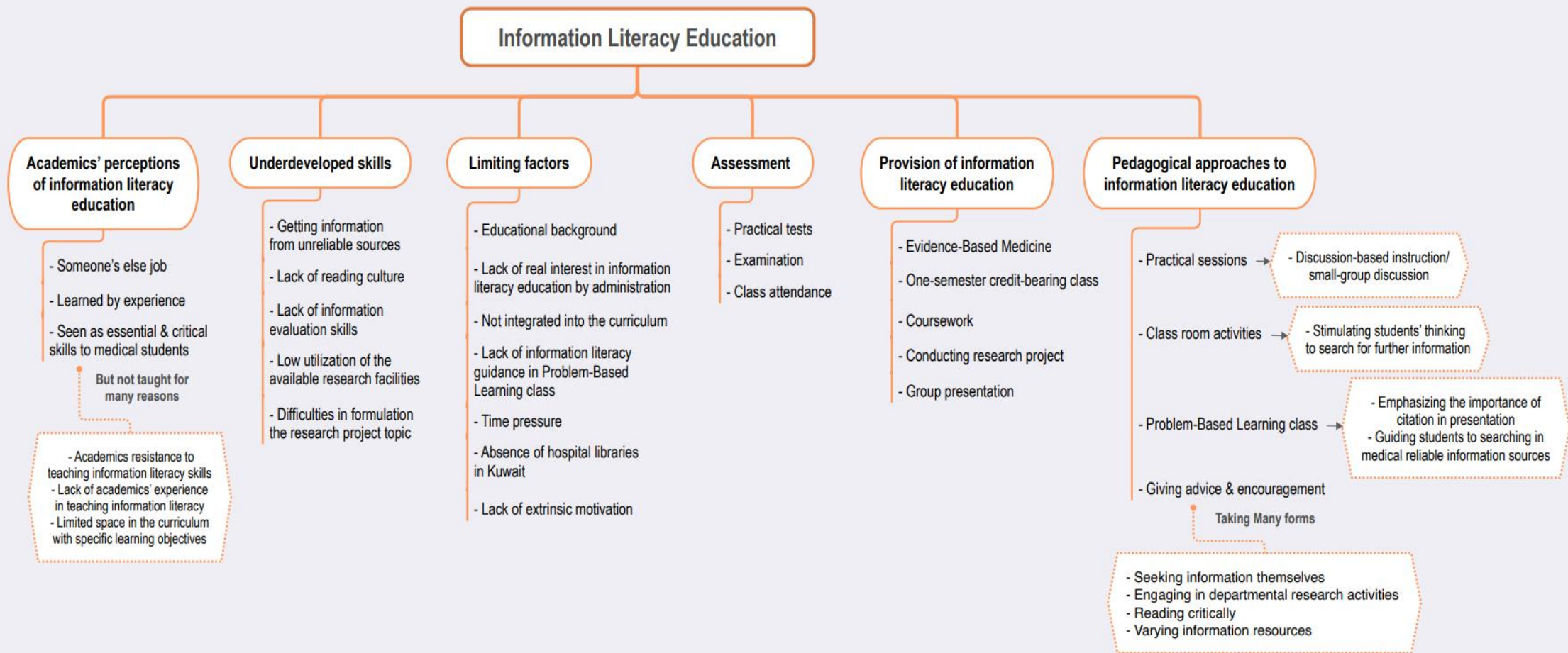


Figure 8-3 Information Literacy Education: Medical Academics

8.4.1. Medical academics' perceptions of ILE

Medical academics identify many views concerning their role in teaching IL. Most participants agreed on the importance of acquiring IL skills for medical students. As the MA18 interviewee said, "So I completely believe that these [IL skills] are essential and critical skills for students must acquire...because I think they're not born with these skills; they need to learn them..."

Despite its value, some academics indicated that these skills are not taught to medical students within the context of FOM for many reasons that emerged from the analysis. These are:

Limited space in the curriculum with specific learning objectives

The tightness of the curriculum was identified as the common influence affecting the academics' perceptions towards teaching IL. They are committed to specific learning objectives and limited time where there is no sufficient place to teach IL skills.

"I do not teach information literacy skills to my students due to time constraints and the need to meet specific teaching objectives." (MA14)

Some academics explicitly stated that they do not teach IL skills to students because of the intensive medical curriculum and limited time. For instance, as one interviewee said:

"I would like to help students become information literate, but the overloaded curriculum makes it impractical to do so." (MA7)

Lack of academics' experience to teach IL

Another participant mainly attributed the cause of not teaching IL skills to students to the deficiency of medical academic experience in such subject areas. This confirms that IL is not necessarily taught and learned by the same approach that is taken or used in preparing other subject areas.

"As academic staff, we also require support in teaching students to acquire these skills. Workshops and training sessions are essential for us to develop effective strategies for imparting information literacy skills to students. While we can educate ourselves in specific areas, it's unrealistic to expect us to be experts in every aspect of the field. A support system that includes training and resources is crucial to ensure we can effectively guide our students in acquiring these essential skills." (MA18)

Academics' resistance to teaching IL skills

The disparity of teaching and learning approaches adopted by medical academics was seen as considerable resistance to teaching IL:

"In our faculty, students interact with diverse academic staff, each with unique teaching styles. It's worth noting that not all academic staff may prioritise information literacy skills as essential." (MA18)

Information literacy learned by experience

IL teaching is also seen beyond the academics' instructional responsibilities due to the assumption that it requires a long time to be learnt and thus comes by itself without any intervention. More specifically, as one participant argued, synthesising skills are challenging to be taught during a specific period, like a one-shot lecture or a set of short sessions because it is learnt by experience:

“Building these skills takes time and continuous effort. Synthesising information, especially, is a complex skill that develops gradually. Writing skills, in particular, require ongoing practice and refinement and may not develop overnight. Students must recognise that these skills are cultivated through consistent learning and application.” (MA13)

Someone else's job

This perception has previously appeared in the literature (i.e. see Webber & Johnston, 2005). There was an expectation that medical students have already been taught IL skills during their first year, and thus, teaching IL is not the responsibility of medical academics:

“I teach third and fourth-year students, who typically already possess these skills. These skills are usually taught in the first year, with certain doctors coming in to instruct them. Therefore, others have already provided this foundational instruction.” (MA11)

8.4.2. Provision of ILE

There are various educational opportunities through which medical students develop their IL competencies. These are discussed in the following subsections.

Evidence-based medicine (EBM)

The interviews revealed that medical students are exposed to IL in EBM modules concisely and in a short session. One informant explained that:

“I instruct third- and fourth-year students in Evidence-Based Medicine (EBM) sessions. These sessions focus on the latest articles and research, emphasising the EBM approach. We begin introducing EBM concepts in the third year, and it becomes more comprehensive in the fourth year. Additionally, we educate students on utilising search engines effectively for research purposes. We also emphasise the importance of reliable information sources, such as PubMed and Medline databases.” (MA3)

One-semester credit-bearing class

The expectation is that phase (I) medical students at the FOM lack the core IL skills. Based on this, some IL competencies have been integrated into the objectives of the “Introduction to Medicine Computer” course, which is taught by academics from DCM:

“First-year medical students often encounter significant challenges in finding credible information due to a lack of information literacy skills. In response, we

offer these students instruction in information searching skills and administer a medical informatics course, "An Introduction to Medicine Computer," to help them develop these essential skills." (MA6)

Coursework

The interviews revealed that medical students learn IL by conducting small assignments for elective courses in the first year. Skills including using the appropriate reference style, adding a reference list, and avoiding plagiarism are seen as fundamental requirements to perform such tasks:

“First-year medical students are not expected to utilise the complete array of information literacy (IL) skills in their assignments. However, when assigning reports, I encourage them to gather information from multiple sources and express it in their own words to promote originality and prevent potential plagiarism issues.” (MA2)

Conducting research project

The transcript also uncovered that doing a research project under the supervision and direction of a project tutor in phase (III) is one of the most significant opportunities through which medical students practise IL skills at all levels:

“In the fifth year, groups of 6-8 students are occasionally tasked with conducting research projects within a specified timeframe. These projects involve defining research objectives, formulating research questions based on the chosen topic, and culminating in a group presentation.” (MA6)

Group presentation

This task is regarded as an essential part of the above research project. The student is required to present their project as a compulsory task orally. This aims to gain helpful feedback from experienced academics and other interested audiences. This is also regarded as a significant part of communication skills central to the essence of information-literate students in medicine.

“During the Medical School Day in the week after the end of the community medicine course, each student group is required to present their project in a research conference format” (MA6)

8.4.3. Pedagogical approaches to ILE

Various pedagogical approaches are identified in the analysis used by medical academics to engage medical students in ILE. These are discussed in the following subsections.

Problem-based learning classes (PBL)

Some interviewees seized the opportunity of instructive teaching methods in the curriculum, like PBLs, to deliver a range of IL learning experiences. These are as follows:

“We guide students to utilise specific resources such as Up-to-Date and Medscape, along with articles from Medline, for their research. When collecting data, we emphasise the importance of including proper references in their presentations. This means identifying and citing sources for the information presented, including figures, so interested parties can access more details from the references provided in their presentations.” (MA16)

“The primary question is where to locate relevant literature. We consistently advise our students against using sources with .net or .com extensions, which are often considered unreliable. Instead, we recommend sources with .edu, .org, and .gov extensions, as these are typically more credible and trustworthy for academic purposes.” (MA3)

Practical sessions

In this opportunity, some academics adopt student-based teaching approaches: discussion-based instruction and small-group discussion rather than teacher-based approach as with lecture style teaching. Competencies, including critical and analytical thinking abilities and two-way interactions, are underpinned, thus encouraging deep learning.

“In the past, the traditional approach involved lecturers explaining anatomical details on cadavers, with students playing a passive role as mere recipients of information. Many educators, including myself, are moving toward a more interactive approach. We encourage students to actively participate in explaining concepts, taking on the role of instructors. This approach promotes presentation skills development, boosts self-confidence, and fosters student engagement. Additionally, it encourages students to cultivate the crucial skill of acknowledging when they are mistaken or need correction.” (MA14)

Classroom activities

Asking questions is one of the practical pedagogical approaches some medical academics apply in the classroom. They implicitly recognised that such approaches play a significant part in ILE by stimulating students’ thinking to search for further information to address the problem under investigation or to answer their questions. As an MA7 interviewee stated, “ My teaching method is always to give the students questions that need quite a bit of thinking to come up with the answers on their own”. Another participant echoed a similar idea with much emphasis on a strategy that requires access to information sources, saying that:

“Encouraging critical thinking and problem-solving, we help students develop valuable skills. We can further enhance this approach by incorporating group discussions, encouraging peer-to-peer teaching, and promoting collaborative learning. These strategies can foster deeper understanding and engagement among students while building their ability to research and analyse information step by step” (MA18)

Giving advice and encouragement

The analysis of transcripts also revealed that medical academics provide students with critical advice and recommendations which can be considered as pedagogical attempts to support the development of IL level. These recommendations can take many forms, as follows.

Seeking information themselves

Some medical academics encourage students to be more active in gathering the required information related to the scientific subject themselves before engaging in an honest discussion. For example, some participants explained their approaches, which seem to be a way of tackling the issue of information transmission, stating that:

“I usually combine inculcation with making further information available to students through notes while motivating them to do their research and not just be passive recipients of information. For example, when I ask the students about a particular topic, I encourage them to seek relevant information and research possible answers before I provide the correct answer” (MA5)

“I always urge students to collect medical information by themselves because, to be honest, medical students always seek to get information directly through the subject instructor and avoid doing their research under the pretext of time limitations as opposed to what a student should do, which is read a lot and use the library” (MA7)

Another participant follows a different approach to motivating students to gather information by providing less information required to do their tasks. By doing so, they are expected to seek information from additional resources beyond the scope of the curriculum information sources to achieve their learning tasks.

“Encouraging students to seek information independently and providing less information to stimulate their curiosity and self-directed learning is an effective teaching strategy. It motivates students to engage with the material actively and prepares them for real-world scenarios where they must seek information proactively. By emphasising the importance of self-initiated learning, you are helping students develop valuable skills that will serve them well in their medical education and future careers.” (MA1)

Reading critically

Reading for academic purposes is different from reading for leisure. Thus, one lecturer encouraged the students to read critically by encouraging them to read scientific papers. Reading the discussion section is also seen as developing analytical thinking skills.

“I advise students to read the discussion section comparing the results or articles. I think this helps them develop critical thinking skills and determine why this result is better researched and vice versa.” (MA2)

Standard advice related to the extent of information by referring to additional resources in the reference lists to collect the most relevant information to their interests is also highlighted.

“I always advise my students to read topic-related abstracts and, if possible, whole research papers. I also advise them to read the other sources referenced in a given source along with other articles on the same topic to build more background information on the topic, and this way reading becomes much easier” (MA2)

Varying information resources

One lecturer guides students to vary the kinds of information resources when collecting information needed, concentrating on issues associated with the reliability and validity of data. The importance of digging beneath the titles and headlines to achieve deep understanding was also highlighted.

“I advise my students to read textbooks, research papers, diagrams, Google searches and watch educational films on YouTube while always taking into consideration the quality and the comprehensiveness of the information as the students tend to just read the titles and headlines without any in-depth reading of the content, which can be problematic sometimes” (MA8)

Engaging in departmental research activities

As shown by the faculty’s vision evidenced in documents (e.g. undergraduate student handbook), medical academic and students have access to high-quality facilities for teaching and research, including a lot of multi-discipline and clinical skills labs, equipment, animals and technology resources. As a result, students are motivated by academics to take part in such research activities regarded as an effective way to promote their IL skills:

“So, we encourage the students... how to engage in the research. Our department tries to motivate the students to do their research. We are supervising a research project by graduate students on the impact of COVID-19 on depression and anger” (MA4)

8.4.4. Assessment

A few assessment methods are identified within the analysis of interviews in the FOM used to assess students’ IL learning outcomes. These methods are discussed in the following subsections.

Practical test

The transcripts revealed that IL skills are also assessed and measured through implementing practical examinations, which is a fundamental part of the assessment criteria of the IMC module. As evidenced by the analysis of interview transcripts and documents, at the end of the first semester in the first year, medical students must also take this kind of examination to check their understanding of IL skills that they intake through the course.

“In this course, there is more reliance upon written examinations, while IL skills, such as information searching skills, are evaluated through practical examinations in the first year” (MA6)

Class attendance

Academics viewed attendance as vital to the PBL approach, with the implication that more attendance should be mandatory rather than just requiring attendance at two sessions to qualify for assessment. So, class attendance plays a critical role in the FOM context. As explicitly stated, although checking attendance is minimalist, it can work well, particularly in PBL classes. For instance, some medical academics explained that attendance demonstration is the only way to reinforce medical students to attend teaching events such as PBLs wherein students can develop and learn IL skills.

“What is even worse is that the PBL module doesn’t have any weight when calculating students’ grades because all a student has to do is just attend two sessions to be entitled to sit the final exam” (MA14)

“You can imagine that student just attend for attendance’s sake” (MA18)

Examination

Examinations are regarded as one of the significant assessment methods used within the FOM to assess students’ knowledge and learning outcomes. They can be either formative or summative assessment:

“The only methods I use to evaluate learning outcomes are semestral and final exams. Students are not given homework or asked to submit reports or research papers in chemistry because the evaluation of first-year medical students is exclusively based upon exams” (MA8)

Some participants asserted IL plays a significant role in performing specific assessment methods, including writing essays or reports. Still, they are less used in the context of FOM, particularly in-phase (I) and (II):

“Students are not given homework or asked to submit reports or research papers in chemistry because the evaluation of first-year medical students is exclusively based upon exams. Therefore, I think that information literacy skills aren’t currently used as an evaluation criterion, and students were previously required to write reports” (MA8)

“I think information skills are significantly helpful when writing essays or reports because they need to collect information from multiple sources in medical databases. However, they are much more useful when writing essays rather than when doing tests” (MA2)

Medical academics recognise that such assessments can play a minimal part in motivating students' higher-order cognitive skills but place much emphasis on facts, information acquisition, and recall from limited access resources.

“Our students primarily gather information based on what is required for their exams. They focus on specific exam-related content and often do not explore beyond these boundaries. It's important to note that this behaviour is not entirely the student's fault. The educational system places significant emphasis on grading and exam performance. However, students must understand that their exam success alone does not guarantee they will become exceptional doctors. Excelling in exams does not necessarily equate to becoming a brilliant medical professional.” (MA17)

“By employing information literacy skills, we can differentiate between students who excel in exams primarily due to their memorisation abilities and capacity to respond to specific exam questions and those who may score lower but exhibit stronger critical and analytical thinking skills. It's important to recognise that high exam scores do not necessarily reflect a student's overall performance or their ability for analytical thinking.” (MA9)

8.4.5. Underdeveloped skills

Medical academics identified several skills and abilities they perceive medical students lack. These are discussed in detail in the following subsections.

Getting information from less reliable sources

Medical academics identified gathering information from unreliable resources as a potential concern of medical students. For example, one participant claimed that medical students, specifically those in their early years, rely heavily on the Google Search Engine with poor utilisation of reliable medical resources. This was attributed to their low background in IL.

“I think that first-year medical students experience considerable problems /difficulties in finding approved information due to their lack of any information literacy background, as opposed to first through fourth-year students who are fully dependent on Google Search Engine... but this only applies to some but not all students” (MA6)

About PBL classes, another interviewee recognised that some medical students resort to websites or information resources not allocated to medical practitioners or even medical students but rather to lay people or patients to conduct their PBL tasks and presentations.

“The problem with the students is that sometimes they don't know where to search when they do their presentation. You feel that they are taking the information from unreliable sources, so they don't know how to identify reliable sources. You, therefore, find that they use sources such as Mayo Clinic or from some websites that are general for general patients and are not specific for scientists or clinicians” (MA16)

Lack of reading culture

It was indicated that medical students lack reading culture and personal habits of sustained reading of curriculum textbooks. It was recognised as a significant concern that medical students these days, stating that:

“I don’t think our students are reading. They think they can pass the medical curriculum without opening a textbook. And this, in my opinion, is the major obstacle that we are facing these days” (MA15)

According to the transcript, this issue is attributed to the assumption that junior students follow senior students’ recommendations that reading handouts or lecture notes is enough to reach the minimum requirements of passing the exam. Therefore, it is expected that this could have negative impacts on their enriching medical vocabulary and developing communication skills:

“The prevailing culture of relying solely on lecture notes and neglecting to read standard textbooks right from the start of medical school can hinder students in several ways. It may limit their depth of understanding, hinder the development of a broad medical vocabulary, and impact their communication skills.” (MA17)

Low utilisation of the available research facilities

As mentioned above, FOM is well-equipped with high-quality research facilities. However, it was stated that the rate of the utilisation of this equipment by most medical students is not as much as the desired level. It was also noted that most students are not willing to establish scientific collaboration and communication with academics, which is seen as a strong drive for promoting the development of information and research skills.

“At Kuwait University, we have a lot of good labs and facilities, research facilities... but the problem is that our students don't know how to exploit all these facilities to scale up their interest. So, students should explore, have more contact with the administration, be exposed to research, and invest more in research. They have the research capacity. We have a lot of doctors doing research, but we don't see medical students benefit from all these facilities. There are very few students who collaborate with the doctors” (MA12)

Difficulties in the formulation of the research project topic

This challenge is determined within the scope of the CMBS research project. As also evidenced from the document analysis, one faculty member said topic formulation requires a high-level skill where students face significant difficulties without guidance or clear guidelines. Students come to phase (III) as novices to the experience of research project undertaking. Thus, this faculty member defines some of the students' challenges when selecting pertinent project topics.

“In the research course, students are divided into 6-8 student groups, and I, as their supervisor, tell them to select the research subject of their choice. Initially,

they usually come back a week later with a pretty weak research topic, but then through discussion and reviews of relevant literature, we come up with topics that are not previously researched and are applicable in Kuwait” (MA3)

Lack of information evaluation skills

Reviewing medical research is viewed as a high-order intellectual function requiring much more experience. This skill is situated at the heart of the evidence-based medicine approach principles. Thus, one interviewee claimed that due to lack of experience, students would face difficulties when evaluating research papers during their educational career at the FOM:

“I don’t think that the students have sufficient experience to evaluate information and research papers, which is a skill that can only be mastered over time or through work with people with experience in this field” (MA3)

8.4.6. Limiting factors

A series of factors identified by medical academics as a significant cause of inhibiting the development of IL within the setting of FOM. These factors are discussed in the following subsections.

Educational background

Much blame was attributed to the national curriculum in schools in Kuwait. It was argued that such a curriculum emphasises memorisation and recall of facts rather than encouraging IL and analytical thinking skills that are highly required in the FOM context.

“because high schools in Kuwait don’t encourage critical thinking when students come to university, they want to know exactly which page and what paragraph they should memorise without applying critical thinking or trying to understand the information or the concepts” (MA14)

“I think this problem goes back to the earliest years of the student’s education. It is hard to ask a university student who has used memorisation throughout the years of their education to shift courses and smoothly take part in PBL classes to be able to do brainstorms suddenly. The students will be surprised because they are used to attending the lectures, memorising, and asking the tutors which slides the exam questions will come. Unfortunately, this forms a big problem, and I think it is a significant issue that we have to focus on” (MA12)

“They come from high school, so they are not taught how to search for medical cases and solve medical issues or clinical problems” (MA16)

Lack of genuine interest in ILE by the administration

One participant reflected negatively on the administration's agenda regarding ILE in FOM. It was stated that the FOM lacks a clear vision in designing IL programmes from the beginning, which could negatively impact the process of ILE.

“It's a valid concern that medical schools should consider organising workshops and skill development sessions for students from the beginning of their

education. Appreciating the importance of these skills early on can have a significant impact on students' learning journeys. Relying on a chance to acquire such skills may not be the most effective approach. Course instructors can be crucial in motivating students to acquire these skills by actively encouraging their development throughout the medical curriculum” (MA18)

Not integrated into the curriculum

It was identified by one interviewee that IL is not implemented into the curricula, which is considered one of the most significant challenges that hinder IL development.

“If we have to teach our students these concepts from the beginning, these should be implemented in the curriculum” (MA15)

lack of extrinsic motivation

PBL is considered one of the most significant opportunities to enhance information-seeking and encourage IL. However, medical academics observed how removing PBL from the current grading system in FOM has a substantial impact as external motivation on students' performance in such critical pedagogical approaches to improving IL.

“In the past, PBLs had 5% of students' total grade scores, but this percentage has been removed from their assessment system. So now, when you see students in the PBL classes, you can observe that they are not as motivated as their previous colleagues were because they know that tutors cannot set questions in the exam from the PBL content. This content will not assess them; they need to attend the class. You can imagine that students attend the attendance sheet without any learning motivation or interest in the topic. Compared to the situation in the past, there were some questions set in the exam from the PBL material so that students were much more motivated” (MA18)

“What is even worse is that the PBL module doesn't have any weight when calculating students' grades because all a student has to do is attend two sessions to be entitled to sit the final exam, which gives students the impression that information literacy skills aren't as important to acquire or focus upon as the memorisation skills to pass the examinations successfully. The solution is to place equal emphasis upon the development of both PBL and memorisation skills, as a combination of both will produce outstanding and creative doctors” (MA14)

Lack of guidance in PBL class

Medical academics recognised the importance of guidance in PBLs. Thus, lack of direction was identified as a significant factor affecting IL development.

“It's essential for students to receive proper guidance, especially during their early sessions, on where to find reliable information sources and how to analyse medical cases effectively. Tutors play a crucial role in providing this guidance, helping students develop the necessary skills to navigate the complexities of medical practice. This early guidance can set a strong foundation for students' future learning and professional growth.” (MA16)

Time pressure

Most participants agreed with the statement that time constraints pose the most significant challenge to medical students, particularly from the perspective of identifying and using information. Despite the availability of access to information resources, it was noted that it is tough for medical students to seek information from different sources in an environment characterised by information overload and extensive curriculum with limited time.

“The primary challenge faced by medical students is the constraint of time. They are already overwhelmed with their studies and have limited time for additional information-seeking. Despite having access to various resources, the scarcity of time during medical school is a significant barrier to further research and in-depth information gathering. Medical students often find themselves in demanding situations during their education, making it challenging to allocate sufficient time for additional studies and research.” (MA11)

In addition, another interviewee stated that time can also pose a real hindrance to becoming information literate in the medical field.

“I don't think the problem is not associated with the availability of information resources because we have a perfect library here at the Faculty of Medicine with subscriptions to the most highly respected medical journals and databases. I think the challenge is associated with timing. They do not have much time to go beyond the curriculum characterised by overloaded information to read and become information literate because they have tight schedules with so many things to do at the same time” (MA1)

Time pressure worsens when students move to the third phase (clinical setting). Most participants identified that in this period, students' schedules are divided between attending lectures in the faculty and daily rotations in the acute hospital setting, which affects their information skills development and information use. Interviewee noted:

“I think there are many barriers/impediments in the medical field, where doctors often have to work overtime daily despite having worked a pretty exhausting regular shift. That is why I always say to my students they have to find enough time to look up information and keep up the skills that help them find information” (MA4)

“I think that one of the major impediments is the time factor. I mean that a medical student does not have enough time to study, read and research because he has an overcrowded schedule, where theoretical work competes for his limited time with the clinical work over two shifts at the hospital” (MA8)

Absence of hospital libraries in Kuwait

Some academics raised the issue of the lack of libraries in Kuwait's hospitals as a major obstacle affecting healthcare practitioners working in the hospital setting. They discussed this issue from the perspective of lack of access to information sources by those supervising

medical students in the clinical setting. Thus, it can be a significant factor that hinders approaches like EBP, which requires access to a wide range of information sources and reflects on their information literacy practices:

“Students losing access to valuable research materials from the university's library after graduation is a problem. To support the ongoing development of information literacy skills and evidence-based practice among healthcare professionals, the Ministry of Health or similar organisations must ensure that their employees can access reliable medical information through subscriptions to relevant databases. This would enable healthcare staff to continue practising these skills and accessing up-to-date research in their workplace, ultimately enhancing the quality of healthcare services.” (MA4)

8.5. Summary

Medical academics define IL in three categories: (1) as core competencies, (2) as higher-order and critical thinking skills, and (3) as making clinical decisions in a humanitarian way. These concepts are experienced in academic study, PBL classes and biomedical settings. They describe information-literate students in the medical field as those who require skills and knowledge inspired by influential attitudes to accomplish the ultimate goal of medical education which aims at successful application and implementation of medical information in the clinical setting. They conceive IL as a critical element, but it is not taught for many reasons. PBLs, EBM, coursework and research projects, and one-shot sessions are the most opportunities for medical students to learn IL in the context of FOM. However, factors such as educational background, time pressure, lack of guidance and absence of hospital libraries are identified as major impacts that may affect IL development.

Chapter 9 Cross-Units Analysis

9.1. Introduction

This chapter aims to present the discussion of the analysis units (phases (I), (II), and (III) in addition to the medical academics' and librarians' understanding of the overall concept of IL phenomena in the context of FOM at KU. The results will be addressed based on the following three specific aspects related to the original research questions:

- Information literacy conceptions;
- Characteristics of information literate medical students;
- Information literacy education.

These aspects are discussed and triangulated to present the similarities and differences that emerged from the units of analysis and documentation respectively.

9.2. Information literacy conceptions

9.2.1. Introduction

The structure of this section begins with a discussion of how IL is conceptualised and perceived among all research participants within the context of the FOM at KU as shown in the following figure 9.1.

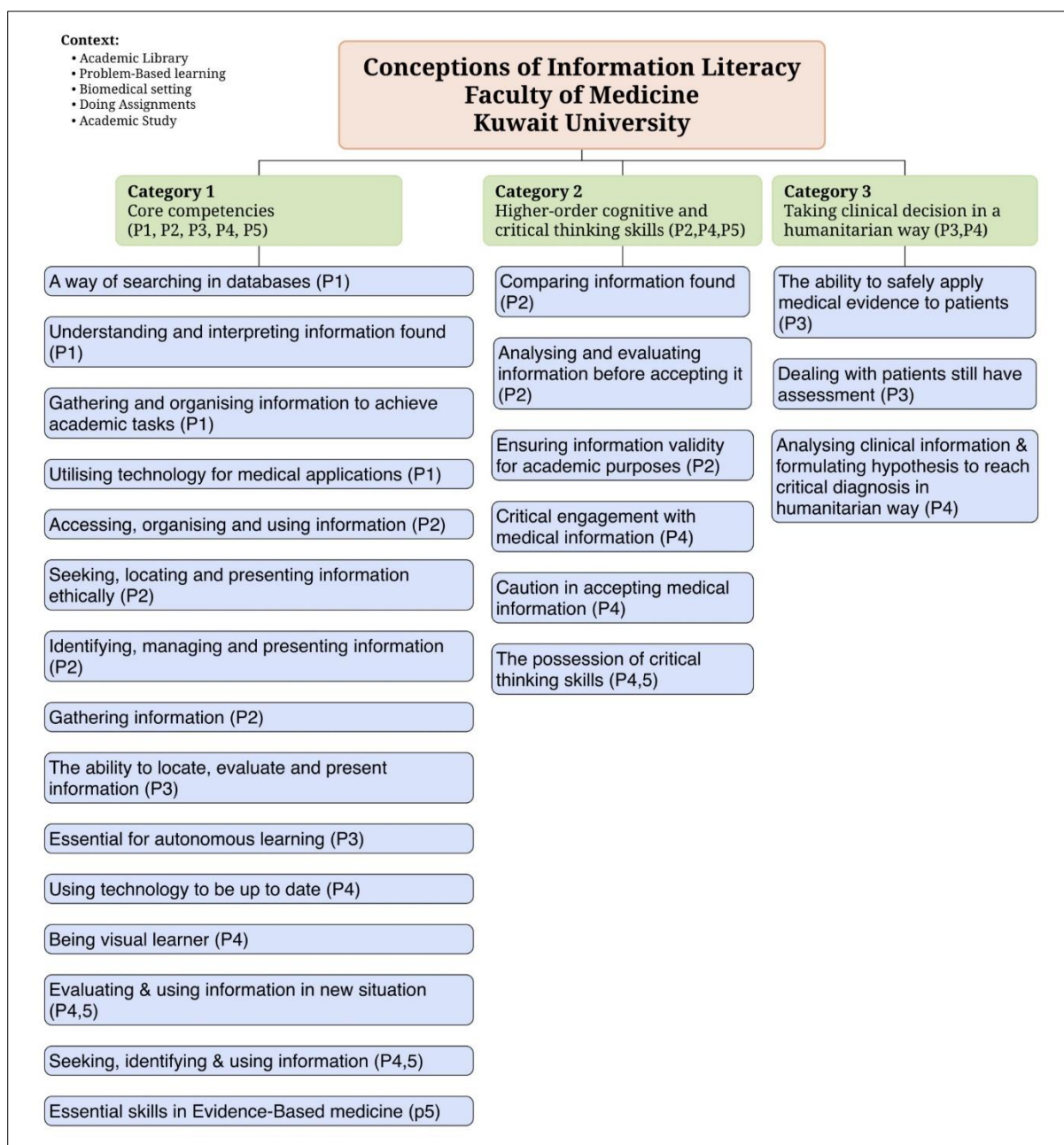


Figure 9-1 Conceptions of Information Literacy: The Faculty of Medicine

P1: Phase (I) Medical Students

P2: Phase (II) Medical Students

P3: Phase (III) Medical Students

P4: Academics P5: Librarians

9.2.2. Category (1): core competencies

Cross-units analysis showed that there is an agreement among all the research participants that core competencies are essential to IL concepts in medicine. These competencies include identifying, gathering, evaluating, managing and using information for particular purposes. These purposes depend on the requirements and features of each phase. For example, during phase (I), first-year medical students use the information to help them understand basic medical subjects. In contrast, in phase (II), the second-year medical students use the information to

achieve specific tasks like PBLs. Phase (III) medical students use the information to cope with the phase (III) curriculum that aims to encourage autonomous learning. This reflects the nature of phase (III) seeking to enhance unscheduled self-learning through which constitutes 30% of phase (III) curriculum and by designing many student-led learning activities that require students to be information literate.

In phase (I), medical students only highlight the ability to search for information on relevant databases as a core competency of IL. Usually, it is defined as the concept of IL as a whole. This limited understanding of the IL concept could be due to the immediate influence of IL teaching interventions offered in the first year that place much focus on developing skills in searching information in medical databases.

The use of technology is seen by medical academics as an intermediary role that keeps medical students up-to-date with the latest developments in medicine. This view is confirmed by medical academics highlighting the importance of medical students' use of technology. This is a more comprehensive view than that proposed by phase (I) medical students, which limits the use of technology to search databases.

Librarians' views of IL in this category reflect their roles as IL trainers and information providers. They defined IL as identifying, seeking, evaluating and using information for academic purposes.

Only medical academics conceive IL as potentially involving visual literacy. This kind of literacy is considered critical in a medical context where a vast amount of information and a complex medical information landscape must be simplified by presenting it visually.

9.2.3. Category (2): higher-order cognitive and critical thinking skills

In this category, medical academics define IL from the perspective of critical and analytical thinking skills. They emphasise the need of possessing the necessary thinking skills as a vital element in the context of medicine more than other participants: medical students and librarians. Thus, evidence shows that their perspective arises from their direct involvement in learning and teaching activities and their professional and career experience and knowledge. In this perspective, they highlight the importance of exercising critical thinking and analytical reading of medical information to engage with and be careful before accepting medical information. They strongly stress the value and need for such abilities, particularly within

problem-solving instructional activities such as PBL. Medical information in such a category is described as something living in a grey zone shrouded in much confusion that requires a higher level of critical and cognitive abilities to be understood and better digested. These abilities enable medical students to critically analyse, evaluate, and synthesise information to reach new knowledge and find the best solutions to the medical and clinical cases. From this aspect, medical academics expressed a greater interest in conceptual skills that medical students need to develop and possess in this context than other lower-order thinking skills like access to information.

Phase (II) medical students also highlight the importance of critical thinking skills within the preclinical phase. Evidence shows that their perspectives arise due to the requirements of the phase (II) curriculum and PBL environments that require a high level of thinking skills.

Librarians also perceive IL as critical thinking skills but from quite a narrow perspective associated with the EBM approach. They believe IL can be labelled as a necessary thinking skill vital in accomplishing the EBM model by critically appraising medical evidence to make the right healthcare decision. Librarians' conception of IL probably reflects their role as trainers who provide workshops, especially on EBM databases available in the context of HSCL. Thus, they highlight the medical students' IL needs in this context.

It is worth mentioning that phase (I & III) medical students did not address this category. This is probably due to the following reasons. Regarding phase (I) medical students, it could be due to the curriculum of phase (I), where high levels of analytical and critical abilities are not much emphasised, and it could relate to their educational background that places much stress on information memorisation and fact recall rather than necessary thinking skills. Concerning phase (III) medical students, this may be due to the nature of phase (III) curriculum that focuses more on information application skills instead of other skills or because of the small sample size.

9.2.4. Category (3): taking clinical decisions in a human way

Concerning the third category, IL is defined from a more focused perspective pertaining precisely to the clinical and biomedical context. This aspect possibly indicates that IL can be interpreted and allocated as a medical and clinical concept. Also, it has to be understood as a particular utilisation of information according to the discipline-specific domain. This seems clear through how medical academics and clinical students emphasise using data to generate

new knowledge to create hypotheses, conclusions and diagnoses by humans to make decisions and develop health plans. This perspective categorises the unique features of IL in a specific context, i.e., a clinical setting.

As is revealed from cross-units analysis, the conception of IL discussed in this category is indicated only by medical academics and phase (III) medical students but with much more detail by academics. With academics, this could be due to their long professional experience and knowledge as physicians working in hospitals besides their job as tutors for the FOM. Regarding students, this may be because of the nature and requirements of the clinical phase that requires spending a long time in the hospital and practising the clinical cases in their daily routine. However, only medical academics raised the human aspect as a critical component of IL in this category.

It is worth noting that this category was not highlighted by medical librarians and phase (I & II) medical students. This could be because they lack clinical experience.

9.2.5. Summary

IL is defined in three categories. The findings indicated that the competencies in Category (1) are regarded as stepping stones to more advanced critical thinking and analytical abilities in Category (2). Thus, both work together to form a solid background that enables medical students to create context-based knowledge and develop contextual decision-making capabilities that medical students need in clinical practices in category (3), considering a human dimension which has not previously been identified or discussed in the literature. The perception and understanding of IL in these categories is associated with increasing the complexity of the participants' experience.

9.3. The characteristics of information literate students in the medical field

9.3.1. Introduction

This section aims to provide a holistic description of how information-literate medical students are perceived. This description is configured from multiple perspectives, such as the units of analysis and other significant sources of evidence comprising medical academics, librarians and documentation. The structure of this section begins with the characteristics of information literate as shown in the following figure (9.2.): knowledge, skills, attitudes and practical application, which is the ultimate goal of medical education.

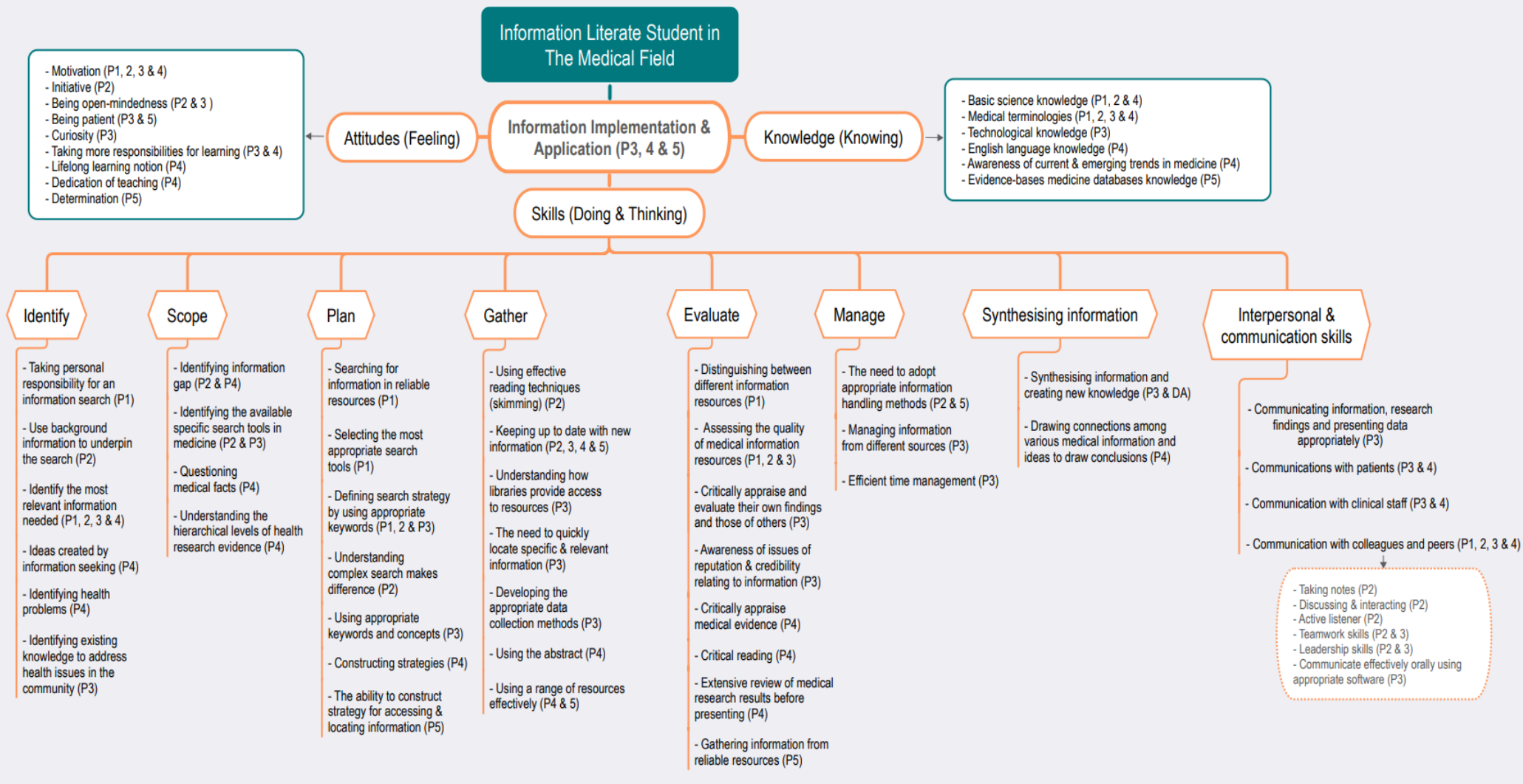


Figure 9-2 Characteristics of an Information Literate Student: Faculty of Medicine

P1: Introductory Phase Students P2: Preclinical Phase Students P3: Clinical Phase Students P4: Academics P5: Librarians
 DA: Document Analysis

9.3.2. Knowledge

Based on the cross-units analysis, medical academics and librarians identify that information literacy in the medical field requires many forms of knowledge. However, this knowledge varies according to the nature and requirements of each phase, plus the educational and professional status of the other participants: academics and librarians.

There is agreement amongst participants of academics, phase (I & II) medical students that having basic medical science is necessary knowledge for being information literate in the medical field. They emphasise possessing such knowledge to achieve their learning objectives and are closely related to career success after graduation and engagement in the clinical setting. However, phase (III) medical students and librarians do not mention this knowledge, which may refer to contextual factors. The clinical phase's main intention is to emphasise integrating basic science knowledge acquired in phase (II) with the clinical science being observed and practised. Regarding librarians, this may be because they are not involved in teaching and learning activities, which probably hinders them from recognising this as relevant knowledge.

A strong consensus on the importance of medical terminology acquisition has been identified among all participants except the librarians, which could be because of the above mentioned reason. Phase (III) medical students need such knowledge to fully understand everyday rotation discussions¹ and arguments raised by clinical senior staff in hospital settings where professional language and technical terms dominate. In contrast, phase (I) medical students consider having medical terminologies as a substantial departure point for them as newcomers to the FOM. Phase (II) medical students do not point out such knowledge, probably due to the small sample of the participants recruited in the study. However, its importance is clearly stated throughout the curriculum, particularly in the English course (183), which constitutes five credits out of sixteen and is taken in the first semester of the second phase. Academics stress the significance of medical terminologies as a critical attribute for medical students in a broad context as they intend to complete their higher education outside Kuwait. Moreover, only medical academics who focus on English language knowledge are considered as language instructors in the FOM. The reason may be their experience as tutors in the learning process.

¹ It is a daily morning meeting taking place in the hospital in which clinical and medical cases are presented and summarised by phase (III) medical students in front of senior consultants.

Medical academics recognise that medical students should be aware of the current trends in the medical field, which other participants do not indicate. This awareness involves how medical students should be knowledgeable in efficiently dealing with substantial medical databases, especially those related to genetic diseases and how they function. Therefore, being information literate is essential for the optimal use of such databases while working on academic tasks or addressing clinical issues. In a relatively similar way, librarians highlight the knowledge that medical students need in a more focused perspective. This is the context of the EBM database, where IL skills play a significant part in its functions. They expect that medical students should be aware of the EBM model and the structure of the EBM database in terms of an awareness of its nature of evidence sources and an understanding of its quality based on the recognition of specific evaluation criteria.

Cross-units analysis reveals that phase (III) medical students need to acquire more technological knowledge (e.g. using the appropriate analysis software & using the computer to locate online resources related to medicine) compared to their counterparts from phase (I & II) who do not mention this. These kinds of knowledge correlate to their contextual setting and compulsory academic requirements. For example, they highlight the importance of acquiring technological knowledge using specific applications like Excel, PowerPoint and SPSS to successfully undertake clinical and behavioural research projects in phase (III).

9.3.3. Skills (Related to the main aspect as shown in figure 9-2)

There is an apparent agreement that skills are considered to be a vital attribute of being information literate in the field of medicine. These skills are identified within the academic context and determined within the biomedical setting. Some have emerged as new abilities that fit the nature of the medical discipline and medical students' needs. However, cross-units analysis shows considerable variation across all groups of participants in terms of the types and level of abilities that reflect the needs of specific groups of learners. The differences and similarities for this category are discussed in more detail as follows.

Identify: A medical student can identify a need for information to perform academic tasks or to address medical issues.

All participants, except librarians, recognise this skill as a critical attribute of being information literate in medicine. They generally recognise this as the ability to identify information needs. Most medical students from all phases plus academics emphasise how students should identify

the most relevant medical information needed to fulfil academic tasks and promote educational attainment. Furthermore, academics emphasise the need for medical students to seek information. They believe that seeking information helps medical students to think more broadly which could lead to recognising new ideas and creating opportunities.

Only medical academics explain that identifying information needed in the clinical setting starts with identifying health problems through the proper patient diagnosis. These health problems are seen as an initial step to identify a lack of knowledge, which can then be turned into research questions or search topics to determine the required information to address clinical issues. This is presumably due to the nature of their jobs, which entail working as academics at universities and as clinicians in hospitals.

Scope: Medical students are able to assess and question their current medical knowledge and facts and identify gaps.

Medical academics and students from phases II and III identified that assessing current knowledge and identifying gaps is essential to being information-literate medical students. Cross-units analysis unfolds that phase (II) medical students focus on this to satisfy information needs that could occur due to considerable dependence on limited resources such as handouts or lecture notes during the second phase. In contrast, phase (III) medical students emphasise identifying the gap in the current knowledge to formulate research questions in the more complex context of undertaking research projects during the clinical phase. However, both articulate the significance of such skills, particularly in knowing the different kinds of medical information sources available to them to obtain that missing information.

Medical academics require medical students to ask critical questions about medical facts that they usually find difficult to question. By doing so, they believe that medical students will realise the gaps in knowledge and then discover something new.

Plan: constructing strategies for locating information and data

There is agreement amongst all participants that medical students should demonstrate an awareness of how to conduct search strategies to locate potential resources that best fit the tasks at hand. This is clearly explained through the statement made by librarians' interviews while discussing the perceived problems that medical students face. Therefore, medical librarians place much stress on developing such skills as being information-literate medical students. Medical academics highlight the crucial role played by librarians in promoting this ability

through delivering IL learning interventions. The participating students identify search techniques using the Boolean technique, the appropriate keywords, synonyms, and narrowing and widening the search results by utilising filtering methods and selecting good tools. Interestingly, phase (I) medical students show more significant concerns for developing this ability as a core competence of being information literate than phase (II & III) medical students. This may be because of the immediate effect of IL sessions and workshops offered during the first year that primarily concentrate on developing practical skills in searching databases as well as their willingness to enhance such skills considering a new competence that had not been experienced before at some point during high school. Moreover, medical students must navigate complex medical information environments to meet their academic and clinical tasks, such as doing coursework and accomplishing weekly PBL classes.

Gather: locate and access the information and data they need

Generally, all participants apart from phase (I) medical students indicate that information-literate students in the medical context should be able to access and locate information needed from various sources. Cross-units analysis revealed a consensus among the participants regarding the issue of being up-to-date with the latest medical developments and information sources recently available in a wide range of formats. For example, academics demonstrate a greater understanding of how new information formats, such as social media channels, serve as effective communication tools in keeping medical students acquainted with what is happening. Librarians stress that medical students must collect information from various sources to broaden and diversify their medical knowledge.

Phase (III) medical students show higher interest in using online resources than their counterparts from phase (I & II) medical students. This interest came due to the specific nature of the clinical setting, which requires instant access to up-to-date information as a form of quick answers to clinical queries in everyday hospital rotations. Therefore, they emphasise using the UPTODATE website within such a context. It provides them with search engines that offer the content from the site in response to these instant questions. Such information formats are not much required during phase (I & II) since the focus is more on acquiring basic science knowledge. Thus, the speed factor here is unnecessary.

Developing data collection methods is identified as a critical skill of gathering information and data known as primary data or information. Only clinical students highlight this ability as a

core competency they must develop during phase (III). This is because they are required to complete a community-based research project on Community Medicine or a health situation analysis in small groups as a compulsory requirement in year 5.

Evaluate: evaluate information and data.

All the participants place a greater emphasis on the aspect of medical information evaluation. They agree that being information literate in medicine requires critically evaluating the credibility, reliability and accuracy of medical sources and evidence before choosing and selecting the suitable one to fit their academic and clinical purposes. This fundamental interest is due to the specific nature of the medical discipline, where making decisions based on the selection of information and evidence requires close examination. However, the degree of this examination varies according to the nature and requirements of each different phase within the context of FOM. For example, phase (III) medical students are expected to have higher evaluation skills due to the nature of the clinical setting closely associated with human decision-making, plus the high level of academic requirements during phase (III), like undertaking research projects. By contrast, phase (I & II) medical students have less required for such skills because they are provided and guided to most of their information resources. These skills are just needed for academic purposes like PBL tasks. Due to their research and clinical experience, medical academics emphasise this ability from a particular perspective. They expect those in the medical field to be more critical and accurate when appraising and assessing their research findings by extensively reviewing them before publishing and presenting. They also require medical students to read critically to identify critical points and arguments in a complex information environment.

Manage: Organise information and time management.

Phase (II & III) medical students are more aware of organising information and sources for future retrieval and reference than phase (I) medical students. This awareness is raised because of the vast amount of information they receive from extensive medical curricula and other learning activity materials before and during the clinical phases. Therefore, they recognise the need to devise an effective way to help them manage and handle their source material effectively. Librarians also address this point, evident in the documents related to the provision of ILE, which focuses on using appropriate software to manage information and data using reference management software.

Concerning their various clerkship and medical school day activities, phase (III) medical students focus more on the need to be aware of time management to overcome time constraints resulting from the workplace in hospitals accompanied by the daily attendance on campus.

Synthesise: Synthesising information to create new knowledge or clinical conclusions

As evident from cross-units analysis, phase (III) medical students identify that information-literate students in the medical field should demonstrate various skills, including synthesising new and previously acquired information and data to produce new knowledge and disseminate their work. This attention is due to the compulsory contextual requirements (e.g. conducting a research project in year 5) in which students need to be aware of a high level of information skills to generate new valuable products that can potentially be published in scholarly peer-reviewed journals, as shown from one work of the interviewed students (see appendix 12, p.385). Evidence also emerged from document analysis that the findings of such a project could be used in improving healthcare services in Kuwait (Department of Community Medicine, 2016, p. 7).

However, medical academics highlight this aspect from a slightly different perspective. They indicate this as the ability to make causal links between different kinds of medical information, which entails greater analytical and cognitive thinking skills. It is highly required by all medical students to reach robust conclusions. Thus, much emphasis is placed on the role of IL in cultivating and sharpening such core skills in the context of Medicine.

Notably, the librarians do not mention this critical aspect, which could be traced to two reasons. First, it may go beyond the scope of their IL pedagogical practices, primarily limited to developing practical skills in searching information and library orientation. Second, they do not take a real and significant part in the teaching and learning process within the context of FOM.

Interpersonal and communication skills

There is an agreement amongst all participants except librarians that medical students need to have communication skills to become information literate. However, there is also a variation in the degree of their descriptions, which correlate to the situational requirements of each phase. Phase (I) medical students refer to this from the micro level that they must communicate with their colleagues and tutors to build a relationship as a substantial departure in FOM. Phase (II) medical students must have the same type of communication but at a higher level. They must

communicate with their peers to perform effectively and efficiently within participatory learning environments such as PBL. They should develop interpersonal and other significant skills, including teamwork, leadership, taking notes, active listening, and discussing and interacting using verbal and written methods. In addition to the above, phase (III) medical students tend to develop more communication skills on a broader scale to involve interacting with medical staff in the hospital workplace and patients who need particular communication when seeking information that facilitates taking patient history note records. This kind of communication skill differs from that required in the preclinical phase due to the nature of the clinical stage, which requires involvement in both clinical and academic contexts.

9.3.4. Attitudes

There is agreement amongst all of the study participants that holding positive attitudes is considered a robust construct of information-literate students in the context of medicine. They believe such attitudes strongly favour students' information-seeking process, and general learning. Therefore, they identify a set of enthusiastic attitudes and values that should be situated in the medical field's information-literate personality. However, cross-units analysis revealed that these attitudes profoundly affect different aspects discussed in the following sections.

Almost all participants except librarians emphasise that self-motivation (wanting to learn) is a crucial attribute of an information-literate student in the medical field. However, due to their educational status, academics define this attitude in a broader context than other participants. They believe that having inside passion and self-motivation significantly impacts students' willingness to seek further information beyond the curriculum, which aligns with what medical students stress as necessary to achieve high grades. Moreover, they define self-motivation as an active learner and paying much attention in specific contexts like PBL classes to motivate the students to participate in such a constructive learning environment effectively. Phase (III) medical students also emphasise this aspect from a different perspective. They identify that working in a hospital requires medical students to be enthusiastic about being close to experienced physicians to gain clinical experience and tacit knowledge.

Phase (II & III) medical students determine that they need to be open-minded and think broadly, particularly in problem-solving. They generally explain this by considering all clinical and medical possibilities from different resources before approaching the clinical cases. Also, they

must be open when accepting others' views and opinions. The need to acquire such an attitude resulted from deeper engagement in a participatory learning environment such as PBL that requires higher degrees of open-mindedness among students to create their knowledge constructively.

Taking responsibility for learning is identified as a critical attitude that should be embedded into the character of medical students. Hence, medical academics and phase (III) medical students recognise the existence of such a trait as a necessary attribute of being information literate within the medical context. The emphasis on this value by those participants may be because of many reasons. First, the nature of the clinical stage requires students to have a high sense of responsibility towards their learning to achieve the clinical stage's underlying vision, which calls for more independence. Second, academics also identify this due to their high status in the educational process. They mention that such an attitude is central to medical education because it promotes lifelong learning, and IL and information-seeking are essential factors in the success of such a notion. Third, in phase (III), medical students place much emphasis on taking more responsibilities than their counterparts in phases (I & II) to meet the main educational requirements of the clinical phase, which requires searching for further information from different resources to accomplish clinical phase objectives that "30% of all scheduled weeks will remain unscheduled for self-directed independent study" (Faculty of Medicine, 2022, p.86).

Medical academics and other participants want their students to be dedicated to teaching and learning from each other and believing in lifelong learning in medicine. They generally explain this in terms of fostering positive attitudes, the features crucial in the clinical workplace and treatment in general. The focus on such attitudes is clearly stated in the FOM's missions and objectives. It pursues to promote life-long learning by offering research training and academic development and sharing such knowledge with others in the community.

Being patient is identified as a critical attitude by phase (III) medical students plus librarians. The students recognise this attribute's importance based on their clinical workplace experiences. Still, the librarians realise it from different dimensions as a crucial need for all medical students to successfully transition to the FOM situation.

Phase (III) medical students describe the attitude of curiosity in medicine from two dimensions. The former is that the nature of medical facts and information is more sensitive and challenging.

Thus, they are expected to be curious to read critically and not to take it for granted easily. The latter is that knowledge in the clinical context is considerably renewable. Therefore, they must be curious to read continuously to be updated with all medical advancements and innovations.

The cross-units analysis indicates that students in Phase III require a greater emphasis on attitudes and personal values than their counterparts in Phase I and II. These attitudes are essential to navigate the various research, academic, and hospital-based activities closely integrated into the clinical phase of the learning system. This integration significantly enhances their ability to engage in self-directed independent study.

9.3.5. Information implementation and application

The skill of implementing and applying information is related to the ability to apply medical information to clinical cases or research work. This attribute is recognised by academics, phase (III) medical students and librarians as the ultimate goal that information-literate students in the field of medicine strive to accomplish effectively and efficiently. It is seen as the implications of medical education that enable medical students and healthcare professionals to transfer the acquired knowledge and information into practical reality. This significant aspect is not emphasised by phase (I & II) medical students, which might be because of the nature of these phases that mainly aim at acquiring knowledge rather than applying it.

From a more focused perspective, academics identify information implementation as a significant attribute required for medical students. Due to their sophisticated knowledge and practical experiences, they suggest this as an alternative aspect that could replace the “Present Pillar”, which fits well into the academic and research context rather than the clinical and EBP setting. Their suggestion seems to be apparent through the statement made by MA4 (see section 8.3.4.).

9.3.6. Summary

All groups of participants similarly identify that being information literate requires a set of attributes subsumed under three main aspects: knowledge, skills and attitudes. However, medical academics, phase (III) medical students and librarians uniquely conclude that these aspects are essential for achieving the ultimate medical goal of successfully applying the acquired knowledge to the clinical situation. Substantial differences in each element are also identified as sub-attributes falling under each central aspect. These distinctions result from

crucial factors such as the level of study, different information needs, phase-related characteristics and the status of participants.

Moreover, it is derived due to the different requirements of each phase and the participants' status and IL experience. For instance, the skills recognised by librarians focus more on developing practical skills in searching, evaluating and managing gathered information. This could be because of their work as trainers and service providers and the influence of the ILE provision they deliver in the first semester of the first year. Finally, it is worth mentioning that document analysis revealed that the goals of the current curriculum, as stated in the Undergraduate Student Handbook (Faculty of Medicine, 2022), endeavour to bring about desired behavioural changes in these categories (knowledge, skills & attitudes) but without much detail, as this study found.

9.4. Information literacy education in the faculty of medicine

9.4.1. Introduction

This section presents the state of ILE in the FOM from all participants' perspectives. It is supported by evidence from the documents to show a comprehensive picture of what occurs within the context of FOM, as outlined in the following diagram. In this section, some quotes that emerged from document analysis have been introduced. They are considered significant evidence in shaping the whole picture of the ILE state in FOM.

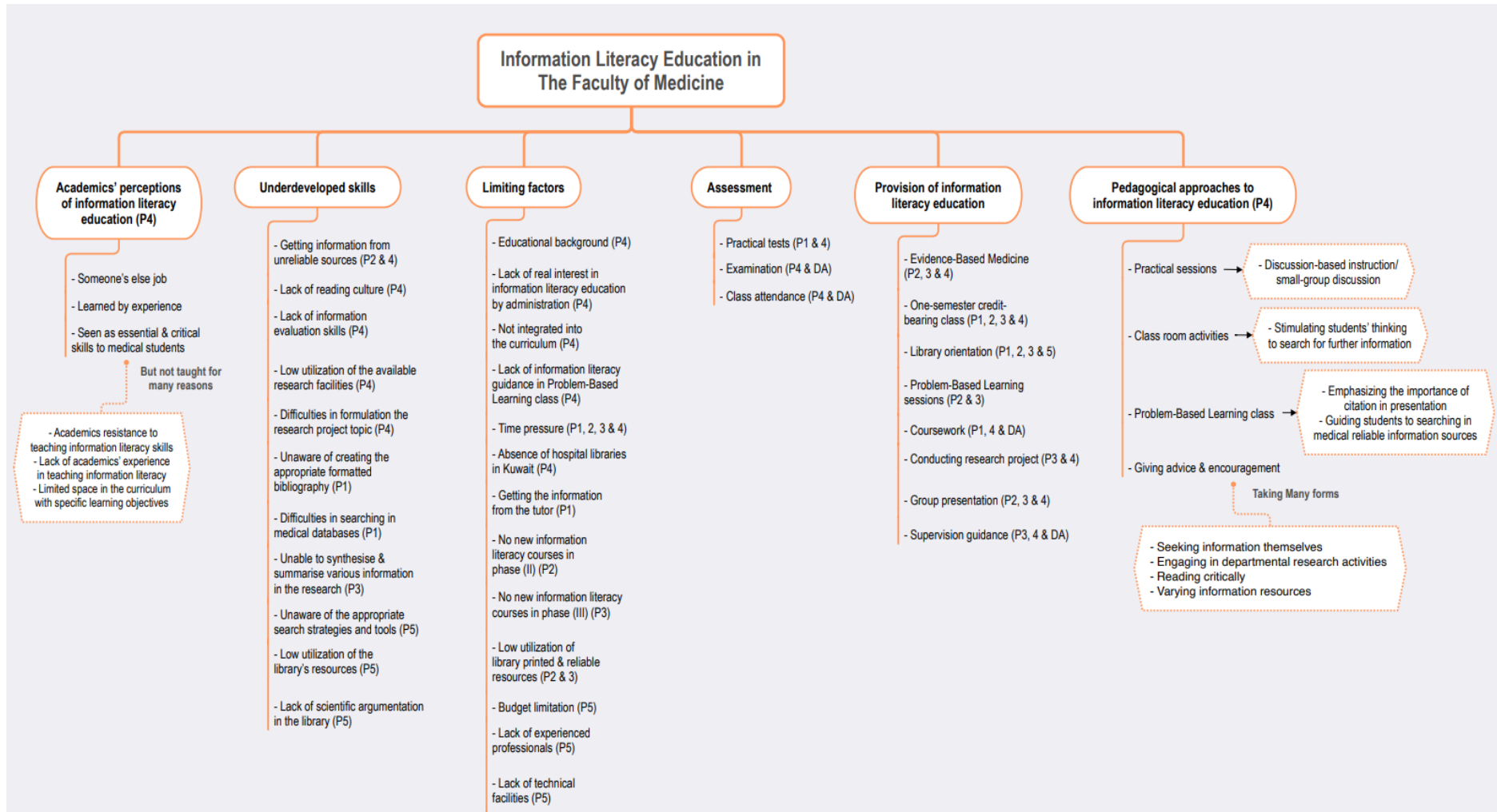


Figure 9-3 Information Literacy Education State: The Faculty of Medicine

P1: Introductory Phase Students P2: Preclinical Phase Students P3: Clinical Phase Students P4: Academics P5: Librarians
 DA: Document Analysis

9.4.2. Pedagogical approaches to information literacy education

Cross-units analysis uncovered a variety of pedagogical approaches being used within the context of the FOM as attempts to improve medical students' IL. However, these endeavours are made informally and voluntarily, most of which lie in lower-order thinking and IL skills such as giving advice, encouraging students to use various sources and guiding them to search for more reliable medical sources.

As mentioned earlier in the context of FOM in chapter (4), several new teaching strategies, e.g. PBL, group discussion, and case-trigger, have been integrated into the new curriculum of FOM. However, lecture-based instruction is still the predominant teaching approach. Academics describe it as a teacher-focused approach in which the primary intention is to transfer information and concepts to students rather than encouraging information-seeking for constructing new knowledge and understanding. As such, they believe that such teaching and learning strategies would not be fertile ground for IL to grow and nurture.

In contrast, approaches such as small-group discussions and PBL sessions are identified as practical ways that give the academics enough room to promote the students' analytical and thinking abilities by engaging them in critically deep discussions. Academics also seize the opportunity of PBL sessions to learn and develop some aspects of IL by emphasising the significance of citation in students' presentations and guiding them to search for reliable information tools.

9.4.3. Provision of ILE

The cross-units analysis supported by the document analysis revealed that medical students are formally engaged in limited ILE provision largely integrated through some courses of FOM's curriculum programme in phase (I). It was also revealed that medical students have few opportunities to practise IL skills during their academic careers. These are explained in more detail in the following subsections.

One-semester credit-bearing class

Medical students from all phases agree that they were engaged in IL skills through one credit stand-alone course, "Introduction to Computers in Medicine", offered during the first semester of the first year by academic staff from DCM. Based on the interviews and document analysis, students are taught some aspects of IL, including constructing research strategy, evaluating

medical websites based on specific criteria and gathering information. It can be observed that this course aims to develop computer and information technology skills rather than focusing on advancing information conceptual skills that are concerned with promoting decision-making, problem-solving and research conducting, which are necessary for medical students.

Library orientation

Medical students and librarians also recognise that ILE is provided by library orientation workshops run by the library staff only once during the first semester of the first year. They are taught library skills, including navigating the library's websites and catalogues and accessing and searching the available databases using Boolean techniques.

Doing coursework

Cross-units analysis revealed that doing assignments of many courses during all phases is an opportunity to practise IL skills. Based on students' transcripts and document analysis, understanding the assessment criteria in doing coursework in elective courses is counted as an IL aspect. These criteria include citing the appropriate references and avoiding plagiarism. However, such assessments do not assess all the elements of IL in the first phase.

Document analysis also revealed that recognising assessment criteria of the assignments offered by English Course 181, 182 & 183 are an excellent opportunity to develop specific aspects of IL. Students are asked to write an essay in which several IL skills are expected to be enhanced and improved. For instance, following an appropriate reference style, which is a compulsory requirement, promotes information managing skills:

“the essay demonstrates correct in-text citations in APA style introduces the in-text citations in a variety of grammatically correct ways, includes a References List at the end of the paper that includes all sources cited, also in APA style” (Mayes, 2020, p.55)

In addition, cognitive skills such as synthesising and making inferences and judgments about information may be enhanced when requiring the students to write their essays from many resources:

“Prepare your references (at least five – the same as for the working bibliography) according to the APA guidelines. Remember to include all the sources you have cited in your text, except for personal communications. Do not include sources you have not cited in your text.” (Mayes, 2020, p. 145)

As mentioned previously, such criteria cannot assess all aspects of IL and English courses' writing essay assignment that is not explicitly stated as a way of ILE and development in students' interview transcripts.

Conducting a research project

Phase (III) medical students identify that conducting the research project during the fifth year as a group work, assigned by the Department of Community Medicine, is a practical approach to practising all aspects of IL and cognitive skills. By doing such research, students must follow many steps, including selection of topics and literature search, the overall structure of the project report, elements of a project report, formatting and presentation and citing the literature. According to the document, this project aims to:

“provides the student a vehicle to assimilate and synthesise the philosophy, content, principles, methods, and skills presented in the CM Rotation. The CMBS project allows students to explore the various dimensions of Community Medicine and promises to provide a more diverse experience for the students” (Department of Community Medicine, 2016, p. 3).

The content of the project can be summarised by the following quotation, which illustrates how phase (III) medical students in the clinical phase require a high level of IL as well as higher-order cognitive skills to accomplish such assessment and their academic requirements:

“The student group will formulate a focused public health or clinically-relevant research question, design quantitative or qualitative data collection procedures and instruments, assure human subjects protection, conduct primary data collection, analyse the collected data, write up a formal report in a thesis format, present the findings in an oral presentation, and produce a “lay” summary of the project findings to provide feedback to key stakeholders in the context of the population from which the data were gathered. Students will be encouraged to publish the findings and distribute their formal project reports to relevant bodies within the government and private sectors” (Department of Community Medicine, 2016, p. 3).

Group presentation

After submitting their final report, students must present their work to the audience at a local conference. This presentation is perceived as a way in which students obtain helpful feedback and comments on their work and as a practical approach to assessing students' understanding and communication skills.

As outlined above, clinical students need higher IL competencies and critical and analytical thinking skills than their counterparts in phases (I & II) to meet their university career and achieve the objectives of the clinical phase.

Evidence-based medicine

The evidence identified in the documents confirms that medical students are taught IL through EBM modules but at low level. They learned just how to construct the optimal search strategies employing Boolean plan, e.g. PubMed database although phase (III) medical students require higher IL competencies.

Problem-based learning sessions

There is an agreement among phase (II & III) medical students and academics that PBL is an excellent opportunity to practise IL. Cross-units analysis revealed evidence that this opportunity is not fully exploited. This may be referred to as the medical academics' resistance to teaching IL skills or lack of experience in delivering IL and thus could lead to most of the underdeveloped skills that emerged from the analysis.

In phase (I), ILE focuses on developing IL skills at lower levels, which are integrated into standalone courses, embedded into different modules, and delivered at an early stage through phase (I). Therefore, much emphasis is placed, particularly by phase (II & III) medical students, on the importance of IL as fundamental skills and knowledge that have to be taught and acquired at phase (II & III). Moreover, they demonstrate their need for IL at higher levels of critical and analytical thinking skills to engage effectively in learning and teaching activities like PBL sessions and efficiently undertake more complex research projects. This can be confirmed through the varying degrees of phase (II & III) medical students' requirements in each phase. Therefore, the FOM may not meet some objectives without integrating IL into the curriculum throughout these phases. At the same time, medical students will likely not possess the IL skills necessary for developing themselves during their career life after the academic life.

9.4.4. Assessment

Examination

Cross-units analysis reveals that various assessment methods are employed within the FOM context. However, there is an agreement among the participants, except librarians who did not mention, that performance-based assessments such as doing coursework, giving oral

presentations and undertaking research projects are more likely to capture IL skills and knowledge than fixed-choice tests (Multiple Choice Questions MCQs), predominantly used in FOM.

Practical test

The cross-units analysis found that practical tests measure IL learning outcomes. It is designed to assess phase (I) medical students' IL skills during the first phase. They are provided practical exercises and exams to check their understanding of IL content delivered through the ICM course. They are also asked to evaluate the credibility, accuracy and reasonableness of a given medical website using a specific checklist and check their ability to access medical resources to locate specific resources.

Short test

Cross-units analysis found that librarians play a minimal role in assessing students' ILE. This takes an informal form that can be regarded as a short exam to check their understanding of what they have learnt during the orientation session delivered in the first semester.

Class attendance

Interview transcripts plus document analysis revealed that strict compulsory class attendance is one of the ways to motivate students to practise IL skills by forcing them to attend PBLs, where IL is an essential component to achieve.

9.4.5. Underdeveloped skills

The cross-units analysis uncovered that each participant group perceives a number of underdeveloped skills from their perspectives and career experience. Academics seem to be more critical and thus identify a set of information and learning problems from their instructional aspects that they believe medical students require to develop. They perceive that students hold negative attitudes towards reading habits, which are considered a key to IL development and to the student's academic success. This is described as a significant challenge that leads medical students to rely heavily on limited resources to satisfy the minimum success requirements.

As mentioned, the FOM has the most modern equipment to facilitate students' learning, teaching and research requirements. The standard problem indicated by medical academics and librarians is that medical students do not fully exploit these facilities as expected.

Both academics and phase (III) medical students highlight the issue of difficulties in identifying the information needed but from varying degrees. Academics indicate that students in the field of medicine are overwhelmed with a tremendous amount of information mainly because of the intensive medical curriculum plus the effect of too much information within a medical setting. Thus, they believe that this, in combination with time pressure factors in the context of medicine, causes a significant challenge to medical students to determine the extent of information needed. Phase (III) medical students refer to this problem within the PBL context when they usually face difficulty identifying the information needed to accomplish the required tasks. This could be linked to the deficiency of the appropriate search strategies and tools perceived by the librarians. They also highlight the lack of the discussion between medical students in the library space as a hindrance to IL development that could enhance clinical and analytical thinking skills (represented in the diagram as "Lack of scientific argumentation in the library").

Within the context of a research project during phase (III), only medical academics and phase (III) medical students identify some deficiencies. The difficulty in formulating the research topic is seen as one of the major problems that medical students face. This is recognised by tutors and is also supported by evidence from document analysis. In contrast, the ability to summarise, analyse and synthesise information is extensively mentioned by phase (III) medical students as perceived difficulties. It is worth noting that both of these competencies lie within the range of higher-order thinking and information skills. This could be mainly attributed to the critical factor of the absence of IL courses during (II & III) identified by medical students from phases (II & III).

Although most provision of ILE is delivered throughout the first phase, phase (I) medical students perceive an unawareness of creating the appropriately formatted bibliography and difficulties in searching in medical databases as significant challenges they face. Such abilities are recognised as essential needs for undertaking their coursework.

Getting information from unreliable sources, particularly for doing PBL tasks, is a critical issue raised by academics and phase (II) medical students. This could be due to a set of relevant

factors mentioned by most participants, including the absence of IL course during the second phase, time pressure, lack of guidance in PBL classes, lack of motivation after stripping PBLs from the entire grading system, students' educational background and IL not integrated into the curriculum.

9.4.6. Limiting factors

A set of limiting factors are identified by all participants that have a direct impact either on medical students' IL development or on the provision of ILE within the FOM. Cross-units analysis revealed that these factors may form critical barriers to the development of IL at various levels. For example, the librarians identified factors related to the infrastructure, such as budget limitations and lack of IL-experienced professionals and technological facilities. The academics recognised factors like lack of institutional support and exclusion of the curriculum, especially disciplinary-based courses. These are seen as the significant challenges that affect ILE provision within the FOM at the institutional level.

Time pressure is identified by all informants apart from the librarians as the biggest challenge that influences all medical students' IL development and their information seeking but to varying degrees. For example, it has more influence on clinical students from phase (III) than their counterparts in step (I & II) because they have a very tight schedule divided between on-campus daily attendance and long working hours in hospitals. Therefore, it is thought that this factor hinders students' abilities to seek information beyond the medical curriculum, characterised as information overload, which leads to less effort to seek and gather information to carry out their academic tasks. Moreover, this could also prevent all medical students from attending the optional individual or collective IL training sessions and workshops organised by the FOM library due to lack of time.

The absence of ILE provision during phases (II & III) is identified by phase (II & III) medical students as a critical challenge that curbs their IL capabilities. At the same time, academics mention the absence of libraries in Kuwaiti hospitals as potential inhibitors for IL development, particularly for those working in the clinical workplace. Both can be seen as barriers to IL development, but the first is a faculty barrier, and the second is an institutional one. Low utilisation of the library resources is also viewed as a barrier to the development of IL at the individual level identified by phase (II & III) medical students.

Medical academics identified the lack of students' interest as a significant challenge for IL development within the context of FOM. This recognition came from their position involved in curriculum design when observing that medical students lack enough enthusiasm in the PBL environment after removing it from the grading system. Therefore, graded assignments in PBLs are suggested as extrinsic motivation to foster IL.

The analysis revealed a link between students' educational background and IL development in FOM. Based on their learning experiences, medical academics criticised the teaching methods used in Kuwaiti state schools. Their curricula underpin rote learning and encourage a teaching-centred approach, which hinders enhancing analytical and critical thinking skills. These skills are required mainly in accomplishing most teaching activities used in FOM, such as PBLs.

In sum, the factors considered by all participants can work together to pose significant obstacles to the effective implementation of IL pedagogical practices within the context of FOM and constitute possible barriers to medical students' IL progression.

9.4.7. Summary

There are few opportunities to learn IL skills within the FOM setting. Most of the IL education is delivered in the first semester of the first year through one-shot sessions and library orientation. IL learning outcomes are measured by formal assessments, such as practical or informal tests, like short tests provided by librarians. The analysis identified that both are designed to assess limited aspects of IL, including lower-order information skills. Factors were determined at various levels, including society, institution, faculty, library and individual. These factors could be significant causes of many deficiencies and form barriers to IL development within the FOM context. Finally, it can be concluded that as is evident in the literature that there is a symbiotic relationship between the EBM approach and IL practices (e.g. Smith, 2019; Murray et al., 2020), but the analysis of documents has revealed that IL is not one of learning outcomes or required competencies in the EBM and PBL curriculums within the context of FOM at KU.

Chapter 10 Discussion

10.1. Introduction

This chapter discusses the analysis's most prominent points and themes to address the research questions and achieve the research goal. First, it covers the discussion of the categories in which IL is conceptualised and conceived in the context of the FOM and then comparing them with the previous IL conceptions existing in the literature. Second, the discussion of the dimensions and aspects of IL that shape medical students in the FOM as information literate is presented and then linked to the findings from the literature as shown in the figure (10.1). Third, a variety of pedagogical approaches used to support the development of IL as well as the librarians' role and identity as teachers within the FOM context is also highlighted with reference to the literature.

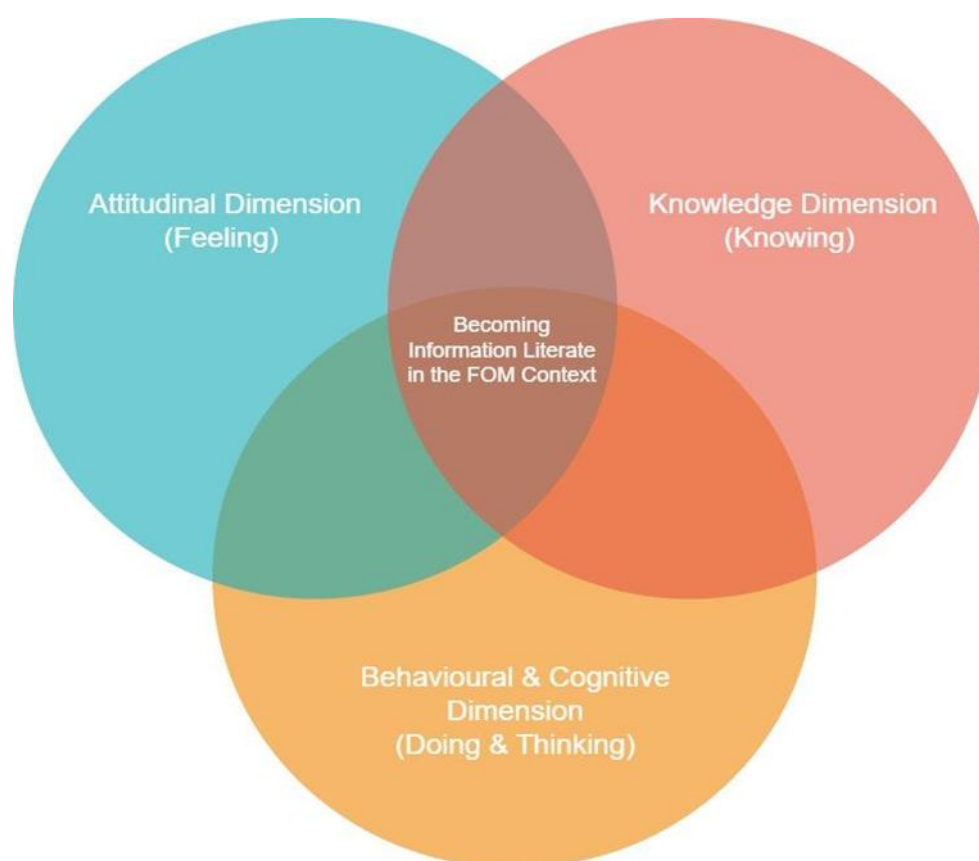


Figure 10-1 Information Literate Students: The Context of The Faculty of Medicine at Kuwait University

10.2. Information literacy conceptions within the context of the FOM

10.2.1. Introduction

This section aims to discuss how the participants perceive IL within the context of the FOM and then link it to and compare it with the findings from the existing literature related to IL conceptions. The results revealed that IL was conceptualised in three categories: (1) core competencies, (2) higher-order cognitive and critical thinking skills, and (3) taking critical decisions in a humanitarian way, as shown in Figure 9.1 in chapter (9). This variation in describing IL is in line with the findings of many seminal studies using the phenomenographic approach that IL is context-specific and not regarded as a one-dimension concept valid across all disciplines and contexts (see, e.g. Bruce, 1997; Boon et al., 2007; Forster, 2015a).

What is interesting about FOM is that different stakeholders, including different levels of students, exhibited different ideas or concepts about the IL phenomenon in one single setting (The FOM). This could be due to the different contexts such as academic and biomedical workplace settings where IL is experienced, as articulated in Figure 9.1. (chapter 9) alternatively, to the different roles performed by the participants. This finding also contradicts Al-issa's (2013) study that sought to find out how Kuwaiti undergraduate students enrolled in public and private universities describe IL. They described the concept of IL as reducing it to limited competencies like searching and analysing information. This limitation in their conceptualisations of IL could be due to the small sample confined only to one perspective (students).

10.2.2. Category (1): core competencies

IL is experienced as a process focusing more on information skills and competencies in this category. The interviewees defined IL as the ability to identify, seek, access, collect, evaluate, manage and use information for specific purposes. These competencies operate across the context of the FOM and underpin an essential background to categories (2 & 3) where information is being experienced in a more complex way. As shown in Figure 9.1, the above conceptions held in category (1) are similar to those skills and desired outcomes expressed in librarian-generated models and frameworks (e.g. SCONUL, 2011; ACRL, 2000). However, significant differences have been recognised as well. For instance, concepts such as “using technology to be up to date”, “essential skills in evidence-based medicine”, “essential skills for autonomous learning”, and “being a visual learner” described in category (1) are not addressed in such models and frameworks. These differences can be linked to the explanation made by Boon et al. (2007, p.222) that “the librarian-devised standards do not include different

disciplinary agendas [and they] delineate what librarians do and believe others should do, generalising information skills and competencies to other disciplines”.

10.2.3. Category (2): higher-order cognitive and critical thinking skills

In this category, IL is viewed as advanced cognitive abilities and processes required in specific contexts, such as performing PBL tasks. In such a context, IL is experienced and described as effective engagement with medical information required in medical education. This engagement needs acquiring a high level of critical and analytical thinking skills. This category supports the view suggested by Bruce and Hughes (2010) that IL is described differently based on the different learning environments. In one learning context, it can be seen as a set of skills to be acquired; in another, it is viewed as a practical engagement with information.

The findings revealed how IL can play a significant part in developing and enhancing critical thinking skills. Participants, particularly academics with high clinical and educational experiences, repeatedly commented on how gaining such skills can make a difference and distinguish between skilful physicians and others in the clinical situation. Category (2) IL conceptions have no generic skills and abilities but further underline the importance of critical thinking and information discernment abilities that empower medical students to make informed decisions while dealing with medical and clinical information and data. The participants’ conceptions of IL in category (2) as thinking critically closely aligns with the CILIP’s (2018) definition of IL that “Information literacy is the ability to think critically and make balanced judgements about any information we find and use” (Coonan et al., 2018, p.3).

During the discussion, the participants explicitly recognised that making sense of and understanding medical subject information primarily entails applying a high level of cognitive abilities and processes, including summarising, comparing, synthesising, criticising, interpreting, and problem-solving. They are seen as essential skills, particularly for high-level medical students, to develop their understanding of more complex medical and clinical information and data regarding previous knowledge. Thus, the conceptions of IL in this category were related to subject-specific intellectual capabilities.

Some medical academics explicitly expressed that medical students lacked the skills to intellectually process medical information, particularly in the context of PBL and some specific subject courses. Therefore, they emphasised supporting the development of such essential skills. However, this is limited by factors such as students’ educational background closely

associated with information memorisation and facts recall and thus, most felt this is beyond their control.

10.2.4. Category (3): taking clinical decisions in a humanitarian way

In this category, IL is experienced by the participants in a way that describes medical students as clinicians or physicians focused on accomplishing specific goals in a specific context. In this context, information and clinical data from various sources were compared, analysed, manipulated and synthesised more sophisticatedly, allowing medical students or practitioners to make more informed decisions closely linked to people's fate. This finding was also supported by Maleki et al. (2023) who recommend that physicians and clinicians should acquire IL skills which help them make more effective decisions in the context of clinical practice that is closely related to people's health.

Human values govern this practice before applying the synthesised evidence to the patients. Therefore, the participants especially emphasised bringing new values related to humanitarian aspects when processing information not previously addressed in the literature. This humanitarian aspect may also suggest a new understanding of IL in which information is used and experienced in a practical workplace where healthcare professionals work and communicate. These findings, particularly the description of IL in category (3), support the view that IL is a contextual and disciplinary term consistent with that of Lloyd and Williamson (2008), who show that IL has various features in different contexts and workplaces.

10.2.5. Comparison with phenomenographic studies

Key similarities and differences between IL experiences described in the above categories and the conceptions that existed in the literature are identified. The following sections will provide a comparison of the emerging categories in this study with IL conceptions identified in phenomenographic studies of Bruce (1997), Boon et al. (2007), and Forster (2015a). Table (10-1) shows the key differences in variables existing between the three phenomenographic studies and the current case study.

Variable	Bruce (1997)	Boon et al. (2007)	Forster (2015)	Current study
Country	Australia	UK	UK	Kuwait
Methodology	phenomenographic	phenomenographic	phenomenographic	Case study
Participants	Academic staff (lecturers, librarians, counsellors and staff developers)	Academic staff (teaching English)	Nurses	Medical academic staff, librarians & students
Sample size	60	20	41	55
Data collection method	Interviews & written responses collected by emails or seminars	Interviews	Interviews	Interviews, Focus group discussion & identifying documents

Table 10-1 key variable differences between Bruce, Boon et al., Forster studies and current study

Comparison with Bruce's "7 Faces" phenomenographic results

Bruce (1997) investigated a variety of Australian academics staff's' conceptions of IL. There is a difference between the nature of samples used in Bruce's (1997) study and this research. For instance, Bruce's study focused on a mixture of staff but it didn't include any students while the conceptions of IL in the current research are derived from the different participant groups (i.e. academics, librarians & students) as noted in table (10.1.). The table (10.2.) shows the categories of IL conceptions of both studies.

Categories of information literacy conceptions of current study	Bruce's seven faces of information literacy conceptions held by Australian academic faculty
1. core competencies 2. higher-order cognitive and critical thinking skills 3. taking clinical decisions in a humanitarian way	1. Use of Information Technology 2. Knowing what information sources to use 3. Knowing processes to search those sources 4. Information control: having information stored and easily to hand 5. Knowledge construction: building a personal knowledge base 6. Knowledge extension: combining knowledge and personal perspectives to create new insights 7. Wisdom: using information wisely to benefit others, exercising judgment, making decisions, researching, and placing the information in a broader context.

Table 10-2 comparison of conceptions of information literacy with Bruce's seven faces

Both studies emphasised the conception of using technology: category (1) of core competencies includes “a way of searching in databases”, “using technology to be up to date” and “utilising technology for medical applications” and Bruce’s “use of information technology” conception. Both conceptions focus on how to use technology for accessing and retrieving information. The purpose of using IT to be up to date and help users to stay informed is identified as a vocal conception of IL in both studies as well. However, using ICT for the purpose of communication identified as a subcategory of conception of information technology use in Bruce’s study was not conceived by the participants of this study. An important difference between the two conceptions can be noted in the more focused way in which medical interviewees’ emphasis on using technology for medical applications in the clinical situation. This could be due to the specific disciplinary nature of medicine in which IL is being experienced.

Regarding the second and third conceptions of Bruce: “information sources conception” and “information process conception” which are defined as identifying, locating and making information more accessible to the uses, are greatly consistent with the majority of

subcategories subsumed under core competencies category in this study including: “seeking, locating, and presenting information ethically”, “identifying, managing, and presenting information”, “gathering information” and “the ability to locate, evaluate and present information”. However, “information presentation”, which is the core element of such conceptions and suggests basic skills of presenting information, is not recognised at the low level of Bruce’s conceptions.

Bruce’s “information control conception”, which focuses on controlling and organising information, does not feature so much in the existing study participants. Moreover, Bruce’s faces such as “knowledge construction conception”, “knowledge extension conception” and “wisdom conception” closely link to the most aspects of “higher-order cognitive and critical thinking skills” and “taking critical decisions in a humanitarian way” conceptions identified in this study. The emphasis on the possession of critical thinking skills identified in category (2) for critical engagement with medical information particularly within the context of PBL curriculum echoes the “knowledge construction conception” described by Bruce (1997) that focuses on learning, and depends on critical thinking.

Moreover, the aspects of developing higher-order analytical, cognitive and critical thinking abilities and “taking critical decisions” are strongly in line with Bruce’s “wisdom conception”. The ultimate goal of both conceptions are intended to use information for the benefit of others but there are different values that control the use of information. In this study, for instance, humanitarian aspects are more prominent. This means that IL is no longer defined only from the academic setting but including wider contexts such as biomedical perspective which is critically related to all people’s lives.

Finally, it is worth noting that aspects such as “being visual learner”, “essential skills in EBM”, “the ability to safely apply medical evidence to patients” and “dealing with patients still have assessment”, which are included into the three main IL category, are not mentioned in any Bruce’s (1997) IL faces. This could be due to the contextual variation of the FOM where IL is experienced in multiple different contexts as shown in figure (9-1) in chapter (9).

Comparison with Boon’s “UK English faculty” phenomenographic results

Boon et al. (2007) used a phenomenographic approach to investigate how UK English faculty members describe IL conception. There are notable differences in the samples. Boon et al. (2007) investigated IL from only the perspective of academic English staff while the current research explores the perceptions of IL from different participant groups as shown in table

(10.1.). Thus, notable similarities and differences are recognised in the findings of both studies as shown in table (10-3).

Categories of information literacy conceptions of current study	Boon’s UK English faculty’s conceptions of information literacy
1. core competencies 2. higher-order cognitive and critical thinking skills 3. taking clinical decisions in a humanitarian way	1. Accessing and retrieving textual information 2. Using ICT to access and retrieve information 3. Possessing basic research skills and knowing how and when to use them 4. Becoming confident autonomous learners and critical thinkers

Table 10-3 comparison of conceptions of information literacy with Boon’s UK English faculty

The use of information technology is identified as an obvious similarity of IL concept between both studies: Boon et al.’s (2007, p. 216) “using ICT to access and retrieve information” and the current research “a way of searching in databases”, “utilising technology for medical application” and “using technology to be up to date”. However, the participants of this study explicitly show their interests in using ICT for various purposes as noted in the above subcategories and not just for accessing and retrieving information as in Boon et al.’s study. This variation might refer to the case that the ever changing medical specialities require medical students and professionals to utilise technological tools with the aim of remaining up to date with the latest medical information and advances in the healthcare field.

Conceptions such as “seeking and locating information”, “identifying and gathering information” and “the ability to locate information” subsumed under the category of core competencies strongly link to Boon et al.’s (2007, p. 214) “accessing and retrieving textual information” conception, whose focus is “on being able to quickly and easily access and retrieve textual information which refers almost exclusively to printed matter, whether it is a book, magazine, journal, etc.” (p. 214). By contrast, the interviewees of this study do not determine a specific type of information like traditional and printed materials identified by Boon et al.’s participants. This could be due to the fact that medical and health information are pervasive and they include wide ranges of mixed resources whether traditional or non-

traditional. Boon's (2007, p. 217) "possessing basic research skills and knowing how and when to use them" conception which focus on "on possessing a set of basic research skills and being able to use and apply those skills when required (e.g. in writing an essay, constructing a presentation, producing material for a dissertation, etc.)" is not defined as a concept of IL in this study but it is explicitly recognised as critical research skills for medical students.

The experiences of IL described in category (2) in this study are also closely linked to Boon et al. 's (2007, p.218) "Becoming confident autonomous learners and critical thinkers" conception. This study's category's primary focus is on acquiring higher-order cognitive skills that enable medical students to increasingly become critical thinkers to critically engage with medical information and be doubtful about it before accepting it within a more complex information-rich landscape. In addition, medical students need to deploy more sophisticated critical and analytical skills to create a new perspective associated with addressing specific medical issues to solve problems at a small scale or to achieve specific learning purposes only within the academic context. Only this aspect differs from Boon et al. 's conception (where IL is seen as applicable to the broader information world and not merely to the academy).

Finally, it is interesting to note that the "taking clinical decisions in a humanitarian way" concept identified in the current research was not expressed by Boon et al. 's (2007) English academic participants. This is explicitly because of the disciplinary differences and the contextual nature of biomedical specialties in which such concept of IL was conceived.

Comparison with Forster's phenomenographic results of nursing

Forster (2015a) used a phenomenographic approach to investigate IL conceptions from the perspective of nurses. Although there are obvious similarities in terms of medical and healthcare context for both studies as noted in table (10-1), notable differences were identified in the findings of IL conceptions as shown in table (10-4).

Categories of information literacy conceptions of current study	Forster's six ways of experiencing information literacy in nursing
1. core competencies 2. higher-order cognitive and critical thinking skills 3. taking clinical decisions in a humanitarian way	1. The passive minimalist 2. The knowledgeable goal achiever 3. The focused, competent and evolving professional 4. The confident and trusted promoter of justifiable change 5. The teacher and promoter of an evidence-based culture 6. The leader, philosopher and strategist

Table 10-4 comparison of conceptions of information literacy with Forster's six ways

There is some similarity between Forster's (2015) "The passive minimalist" conception and the concept of "gathering information" included in category (1): core competencies in the current study. Forster (2015, p. 200) describes this category as a passive information process occurring as frequently as information gathering, to deal with a simple issue or context. Although the participants of the current study do not explicitly mention this passivity, the similarity here can be interpreted with the way in which IL is experienced in category (2): "higher-order cognitive and critical thinking skills" that medical students, after gathering information in category (1), need to critically engage with medical information to deal with more complex situation and issue. This suggests that medical students might experience IL in category (1) at low level of criticality and analysis when information collecting.

There is also an apparent similarity between "The knowledgeable goal achiever" concept identified by Forster (2015a, p. 199), who investigated how IL is experienced by nurses in the context of EBP and how IL was experienced in the clinical setting in this study. Both conceptions focus on seeking, identifying, analysing, processing and applying information and data to meet specific clinical requirements associated with making decisions based on background knowledge and skills. The subtle difference between the two conceptions is that the interviewees of the current study conceive the humanitarian values as experiencing information in the clinical context. At the same time, the nurses did not in Forster's study.

Forster's (2015a, p.199) "The teacher and promoter of an evidence-based culture" conception in which IL is experienced as a leading contribution made to the information-rich culture development, often in a role of teaching mainly with junior staff is not reflected in any of conceptions of the current study. However, it is broadly exhibited in attitudinal and communication aspects of being information literate students identified within the context of the FOM. The subtle difference is that medical students must communicate on a larger scale, including senior and junior clinical staff, peers and colleagues, and patients and their relatives but nurses in Forster's (2015) study communicate at a limited scale just with junior staff.

Finally, it is interesting to note that Forster's (2015) "The focused, competent and evolving professional" and "The leader, philosopher and strategist" were not expressed by any of the current study's interviewees. This difference can be attributed to the influence of the more focused EBP and professional context in which the nurses' experience of IL was studied.

10.2.6. Summary

These emergent findings represent a new addition to the IL term that suggests further investigation into a better understanding of IL conceptions in different contexts like medical and clinical situations where it is still a vague concept (Saranto & Hovenga, 2004) compared to education and librarianship sectors where it has well been established (Aharony, 2010). This also has implications for exploring IL beyond the field of LIS to ensure IL sustainability (Hicks et al., 2022). Interestingly, in this study, all stakeholders have experienced IL on the same level of complexity despite the differences in their academic and educational experiences. This agrees with Forster (2015a), who states that academics do not need to experience IL more sophisticatedly than other individuals, such as students. For example, phase (II-III) and the medical academics have experienced IL in each category. Finally, these differences in the conceptions of IL have practical implications for reconsidering the nature of ILE in the FOM. They suggest that IL skills and abilities should be integrated into the medical curriculum at all levels due to their high relevance to medical education and research practices. They also suggest that lower-order and higher-order IL cognitive skills should be taught in IL programmes within the context of the FOM.

10.3. Information literacy dimensions within the context of the FOM

10.3.1. Introduction

This research has revealed that becoming an information-literate individual within the context of the FOM is a holistic process. Martin (2013) argued that the holistic term is used in most IL models to describe all the processes and tasks that include IL. In this context, it is seen from

the learner perspective and how the whole learning experience transforms medical students on knowledge (knowing), behavioural and cognitive skills (doing and thinking) and attitudinal (feelings) dimensions. These dimensions will be discussed and linked with the findings from the existing literature in the following sections.

10.3.2. Knowledge dimension

The findings revealed that becoming information literate in the FOM requires acquiring various forms of knowledge. For instance, the participants highlighted knowing how to use the technologies, especially phase (III) medical students, as an essential element of IL. They emphasised using several software categories: presenting tools such as MS Word and PowerPoint and analytic tools such as MS Excel and SPSS to fulfil their learning objectives. This result was also reported by Buysse et al. (2018), who found that using technological tools such as those mentioned earlier is an integral part of the IL model they developed for health sciences education in the context of Ghent University in Belgium. They found that using these technologies is a critical dimension that interacts with almost all other dimensions suggested in their model. Therefore, these findings suggest that medical students should get the opportunity from the beginning to possess such significant knowledge through IL learning intervention provided in the first years.

Participants from medical academics also indicated the importance of being aware of the current and latest trends in medicine. They placed great emphasis on being acquainted with what is called precision medicine,² which is an emerging approach to healthcare. As highlighted in the literature, this approach requires physicians and doctors to be able to store, access and interpret patient's clinical data and information (National Library of Medicine [NLM], 2022). The participants of medical academics in the interviews indicated the role of being information literate in successfully implementing this approach. Being information literate might also have implications for addressing some challenges facing doctors when implementing this approach effectively. These challenges, as highlighted in the literature, include storing large amounts of patients' data efficiently, ethical and legal issues related to dealing with protecting patients' information and the increased need to interpret the genetic

² precision medicine is "an emerging approach for disease treatment and prevention that takes into account individual variability in genes, environment, and lifestyle for each person." This approach will allow doctors and researchers to predict more accurately which treatment and prevention strategies for a particular disease will work in which groups of people. It is in contrast to a one-size-fits-all approach, in which disease treatment and prevention strategies are developed for the average person, with less consideration for the differences between individuals.. (NLM,2022).

information to understand its relevance to patients' treatment and then transfer this knowledge to patients (NLM, 2022).

The findings also revealed that acquiring knowledge or understanding of medical terminologies is essential to all medical students, almost all participants (except the librarians), who often articulated their value from slightly different angles. For instance, phase (I) medical students underlined their need for such terminologies in order to understand the medical curricula that reflect their ability to learn as newcomers, whereas phase (III) medical students highlighted their need for such vocabulary used as keywords within the process of searching for medical information due to their different spelling. This statement clearly shows the linkages between all aspects of being information-literate students identified in this study and how such knowledge acquisition helps medical students develop search strategies properly. Medical academics focused on the importance of possessing these terminologies to allow medical students to communicate with others in the clinical workplace effectively. These findings, particularly those that emerged from phase (I) medical students' data, align with that of Stephens and Moxham (2016), who indicated that medical students in the UK, more specifically at Cardiff University, recognised their need to have such knowledge to understand medical curricula during the initial years.

This could also show the relationship between medical academics' conception of IL in the category (1) as visual learning and the types of learning styles medical students take when studying such terminologies. This finding may have practical implications for those who teach IL within the context of the FOM to consider introducing learning style methods into their IL learning intervention. For example, using the VARK (visual, aural, reading/writing, and kinaesthetic) model developed by Fleming and Mills (1992) that is used for learning information could be one of the most important approaches that help medical students devise their approaches to learning medical terminologies and also their other medical subjects.

In addition, several reports have shown that using visual aids in teaching and learning process is very significant and makes it interesting, effective and impactful because such visual prompts simplify teaching and learning process (Dalali, 2022; Rasul, Bukhsh & Batool, 2011; Yadav, Bera et. al., 2015). For example, Khaydarova and Yokubjon (2023) identify a number of benefits of using visual aids such as creating a connection between the literal and figurative meanings, enhancing comprehension and retention, stimulating active participation, cultivating cultural awareness, and emphasising contextual usage. Furthermore, the finding of conceiving

IL as visual learning in this study is consistent with that of Bobek and Tversky (2016) who found that the utilisation of visual explanations such as pictures, graphs and diagrams in learning and teaching enhances students' spatial thinking skills which are regarded as critical abilities for future world. It has been found that those with high spatial ability "are more able to allocate sufficient cognitive resources to building referential connections between visual and verbal information" (p. 3). This research has shown that enhancing visual learning abilities as IL skills has clear benefits to medical students that could help them to create links between a range of medical concepts, information and terminologies.

10.3.3. Behavioural and cognitive dimension

Using the SCONUL Seven Pillars core lens as an analytical framework was helpful as it accommodated a variety of skills and abilities for different levels of learners (units of analysis) operating in different contexts, such as HE and clinical workplaces. Also, it allowed the incorporation of particular language and terminologies used by medical students and academics into the body of the model, blurring the lines between IL and academic skills as Martin (2013) argues that such integration of these two literacies is significant to accomplish a holistic approach to IL.

Using the SCONUL Seven Pillars also aids the participants in understanding IL in a context where constructivist learning strategies like PBL are familiar to participants. In contrast, they have not been exposed to IL terms before. This has been evidenced in the interviews on how the SCONUL model helped medical students reflect on the IL concept and define their information needs. For example, most participants, mainly from phase (III), repeatedly commented that they went through these pillars unconsciously while performing their PBL tasks.

After analysing the interview data and documentation, behavioural and cognitive abilities and competencies have emerged as new skills and then integrated into the existing SCONUL Seven Pillars to create a model appropriate to medical students' circumstances and applicable in the context of the FOM. These skills will be discussed in the following sections and linked to the findings of existing literature, highlighting special attention to the new lenses supported by interview content.

Identify: The research found that a medical student should be able to identify a need for information to perform academic tasks or to address medical issues. The findings revealed that identifying the most relevant information needed is one of the most significant skills medical

students need to master from the beginning within the context of FOM. The need for this ability was explicitly and implicitly confirmed by the participants interviewed from phases (I, II, and III, plus academics). Acquiring such skills is vital in facilitating the transition from a school to a university environment that demands more independent learning. This relates to how such skills help phase (I) medical students to alter learning habits captured in school. They rely highly on their teachers to obtain the information needed rather than identifying their need for information, which is an essential skill in the university climate. This result somewhat resonates with Wagg and McKinney's (2020) finding that IL outreach programs can bridge the skills gap between school and university and help them successfully transition to a university setting that prompts autonomous learning. This result also revealed the nature of IL content delivered to medical students in the first year. This calls to include a diversity of IL skills, not just concentrating on functional skills like navigating websites and finding articles in databases.

The participants repeatedly emphasised their need to determine the most relevant information in a highly intensive medical information environment. As highlighted in the literature, in this stage, medical students need to build robust background knowledge before commencing the stage of information collection (Kuhlthau, 2004). According to her model, this is known as the exploration stage, which is the most difficult for students, where they become confused due to inconsistent and incompatible views regarding their research topic. This confusion could be one reason, as one participant from phase (III) reported, that made their tutor criticise one student because of presenting irrelevant information during the PBL session. Another possible reason could refer to time pressure identified by all participants as a limiting factor that affects all medical students within the context of FOM. This factor might force many students to “skip over the exploration and formulation stages and attempt to move on to the collection stage without having formed a focus for their research” (Kuhlthau, 2004, p.82). To overcome this problem, Kuhlthau suggests various strategies, including browsing various texts, skimming and scanning to get a general picture, and taking notes from various sources.

SCONUL Seven Pillars allowed the participants, particularly medical academics, to reflect on their information experiences to recognise that identifying health problems is crucial for medical students. As highlighted in the literature, this skill is highly required for healthcare professionals in the clinical context and EBM to translate clinical or patient queries to searchable questions to identify the most relevant sources. For example, Smith (2019) argued that the capabilities of health professionals to ask questions to identify someone's health problems and then access the literature to retrieve the relevant evidence to solve this patient's

problem are situated at the heart of IL. This finding also demonstrates the synergic relationship between EBM and IL. This was confirmed by the literature review (Schulte & Knapp, 2017; Smith, 2019) and the focus group discussion analysis of librarians who believe that IL is a fundamental element for those operating in the EBM environment.

Scope: The research found that medical students should be able to assess and question their current medical knowledge and facts and identify gaps. The findings revealed that the scope pillar greatly benefits medical students in filling their information gap for learning purposes and future clinical expertise. Participants, especially medical academics, probably due to their experience, commented on the importance of persistently assessing medical knowledge and questioning medical facts, which could result in medical discoveries. This finding demonstrates the ability to “know what you do not know” as a critical component of IL cited in SCONUL (2011, p.6) for medical students within the context of FOM. This pillar also allowed the participants to add new value in the context of EBM, enabling medical students to distinguish between the grades of various medical evidence before applying them to patients within a clinical setting. There is an apparent similarity between this competence expressed by medical academics in this study and that of Dalton (2013, p.38) who introduced it into Scope Pillar as a unique need of EBP in healthcare, which focuses on understanding “the hierarchical levels and grades of evidence”.

The findings also revealed the medical students’ need for skills to assess and investigate information sources within the medical information landscape. This agrees with that of Tagge (2018), who observed that medical students need basic IL skills to think critically about suitable places of medical information and then evaluate its accuracy and appropriateness.

Plan: This research found that a medical student should be able to construct strategies for locating medical information and data. The research uncovered that the abilities, including using appropriate keywords and concepts, constructing complex search strategies and selecting the appropriate search tools identified by all participants, are crucial IL skills for medical students for academic and clinical purposes. These seem consistent with those identified by Dalton (2013), as IL needs healthcare professionals to maximise their search results’ specificity and relevance.

Medical academics explicitly appreciated the role played by librarians in improving such skills for medical students by offering the appropriate workshops and programmes during the first year. Such an acknowledgement can give the librarians accreditation to prove themselves as a

key partner in designing the curriculum and to determine their position as a teacher rather than just information service providers or trainers, as shown in the focus group discussion analysis. This can also be a reasonable explanation of academics' perception that ILE is "someone else's job," which has previously appeared in the literature (i.e., Webber & Johnston, 2005).

In the interviews, medical academics acknowledged that IL is not taught because they lack sufficient experience in teaching such skills. There are examples in the literature of how academics can also take advantage of IL instructional sessions librarians offer to close their search skill gap. For instance, Tagge (2018), in part of her workshop related to the basics of searching PubMed oriented to medical students, found that multiple faculty in medical school did not know how to use PubMed. Thus, as mentioned earlier, they learned from librarians while delivering the sessions. Similarly, Rahman and Ramzy (2004) researched the reasons behind the low use of E-resources in the FOM library at KU by medical staff. They found that poor search skills are among the primary constraints that affect their effective utilisation of these resources. Thus, such sessions may have further implications for promoting medical students' search skill levels and academics in the context of the FOM. They could also imply changing the academics' perceptions of teaching IL and embedding it into their subjects. For this reason, these skills are taught either by librarians or in conjunction with medical academics, particularly within the context of PBL, where medical students lack enough guidance during such critical learning environments, as noted by the academics.

The participants, particularly phase (II-III) medical students, repeatedly emphasised an urgent need for developing such skills by stating that a one-shot session delivered just in the first year was insufficient to learn such essential skills. These findings revealed a call to integrate these skills into the curriculum. As confirmed by the participants interviewed, the gap from no new IL courses during phases (II) (III) is accelerated. However, this manifests their desire to have such programmes gradually until they reach the top and not just limit them to the first semester from the first year. This suggestion agrees with Buysse et al. (2018), who proposed integrating IL skills into the medical curriculum at vertical levels. This way helps students practise these skills at different levels; thus, they are constantly activated, motivated and easily retained.

Gather: The research found that a medical student should be able to locate and access medical and clinical information and data to meet their needs in different contexts. The results revealed that the setting where medical students operate determines their information behaviours and the type of information resources they use. Despite the different information skills and

behaviours required in these settings (academic and clinical), the SCONUL Seven Pillars model broadly applies to them. For example, phase (III) medical students underlined their need for easy and quick access to high-quality information resources to make more informed healthcare decisions (Dalton, 2013). Therefore, they emphasised utilising the hospital software, UpToDate source, during clinics and hospital words. It is a point-of-care information tool widely used in the clinical setting. It provides a convenient reference point that allows clinical staff to locate filtered information from various sources that summarise high-quality evidence instead of offering in-depth explanations (Addison et al., 2013).

The wide use of UpToDate was highlighted in the interviews within the clinical setting. The phase (III) participants enumerated several features of using such tools during the clinical setting characterised as stressful situations. These include quickly and easily accessible from multiple portals like smartphones, offering reliable information, user-friendly, continuous updating and synthesising and integrating large volumes of information in one clinical evidence as an answer to patient queries that cannot occur by other medical sources that provide full-text exposition. These features are related and distinctive to the clinical context, which clarifies a strong linkage between IL aspects such as searching, gathering and applying information that enables clinical decisions.

The results revealed several benefits of using UpToDate by medical students in their clinical practices. These are consistent with some of the themes identified by Addison et al.'s (2013) study that seeks to discover how physicians use UpToDate in their daily clinical practices. They use it to reach a diagnosis faster, give immediate feedback to patients, make correct treatment decisions and obtain information about new treatments. These could be the potential solutions to barriers affecting medical students' information-seeking identified in the literature and interviews, including lack of time, information overload and too much medical information and work overload in clinical settings. Also, enhancing the ability to locate and gather information could help medical students accelerate access to answers to clinical questions, which often take about 30 min (Daei et al., 2020) since the time factor is the most common effect that impacts medical students' information seeking behaviour in the clinical workplace.

Evaluate: The research found that a medical student should be able to review and evaluate the quality of medical information resources and critically appraise medical and clinical evidence. The results revealed that information evaluation is a critical capability medical students need to develop in a highly complex medical information landscape to be successful learners and

future skilful clinicians. Much emphasis is placed on this demand from all the participants, focusing on the medical academics. Although information appraisal and evaluation are paramount in other contexts, much greater emphasis is placed on information reliability and authority within the healthcare domain (Dalton, 2013).

The participants identified that students must be able to evaluate and critically appraise. However, the education they receive takes a linear and formulaic approach that has been identified as not being the most effective. The interviews and documentation analysis revealed that the CARS (Credibility, Accuracy, Reasonableness, Support) checklist associated with evaluating internet research sources is employed to teach medical students evaluation and appraisal skills in the first year. It is argued that this online approach to teaching information evaluation presents several problems (Feekery & Jeffrey, 2019). One is that such an approach tends to take a linear way that focuses on individual criteria. This linear evaluation approach that supports the tick-box checklist approach to teaching IL skills has been widely criticised (e.g. Webber & Johnston, 2000; Feekery et al., 2021). It is identified that students who are taught with these checklists struggle to determine authentic relevance, authority or credibility because they place much more emphasis on ease of access, content and surface credibility over information quality (Feekery et al., 2021). This approach does not align with the participants' complex understanding of medical information evaluation explicitly captured within the participants' views of IL conceptions of category (2) which is concerned with enhancing higher-order cognitive and critical thinking skills emerging from the analysis. This evaluation category envisages medical students as critical information literate who must deeply engage with the evaluation process of medical and clinical information and data (Feekery & Jeffrey, 2019). Therefore, they need to be taught differently in a way that builds their critical faculties more effectively.

In the literature, there is an increased emphasis on teaching critical appraisal and thinking skills to medical students (e.g. Grimes, Bachicha & Learman, 1998; Forester et al., 2003). Thus, the findings have implications for further supporting medical students' evaluation and appraisal capabilities by offering an alternative approach to fostering their critical engagement with complex and abundant medical information environments. In order to make sure that medical students master critical evaluative and appraisal skills more efficiently, it is suggested that the appropriate training programmes should be implemented into the curriculum to be taught by medical academics on different levels within the context of FOM. By doing so, medical students will be exposed to these skills continuously and be practised gradually regarding the

tasks' difficulty to ensure that they reach the highest level of critical evaluation and then move toward the target of independent thinking. One example of learning activities related to teaching evaluation skills could be that medical students are asked to evaluate or criticise medical information and evidence-based on multiple sources to verify its quality and credibility before integrating it into their practices.

Continuous practice of such an approach could meet medical academics' outlooks that view medical students as critical thinkers who can challenge medical knowledge and facts and always need to be doubtful about medical information before accepting it for granted. Their outlooks of being critical information literate in the FOM setting agree with Walton et al. (2022, p.13), who found that those with a high degree of information discernment are "more likely to be sceptical about information...[and] regard knowledge as not fixed but changing and recognise that knowledge can be contradictory at times". Enhancing medical students' appraisal and evaluation capabilities could also have implications for addressing some of the issues emerging from the analysis explicitly related to obtaining information from unreliable sources and lack of information evaluation skills identified by medical academics.

Manage: The research found that medical students should be able to organise a vast amount of medical information professionally and manage their time efficiently. The analysis revealed that a holistic Seven Pillars approach will help them with this aspect within HE and the clinical context. Medical students, particularly phase (III) medical students, are exposed to considerable information from various sources within the clinical setting, described as a vibrant and busy information environment. Therefore, they indicated an urgent need for developing a way that enables them to manage this information efficiently and effectively. This resonates with the same issue identified by Dalton's (2013) work as a critical theme: clinical staff deal with information from various sources in their daily hospital routine and thus must manage them simultaneously.

Furthermore, using the SCONUL Seven Pillars model allows the participants to reflect on their personal and professional needs as time management skills emerge due to time constraints in medicine. The literature shows that the lines between IL skills and other academic and professional competencies are blurred (Martin, 2013). Time management and planning are identified as a critical skill of IL subsumed under strand (6) Managing Information in a New Curriculum for Information Literacy, in which the students are expected to produce a strategy to manage their workload as desirable learning outcomes (Secker & Coonan, 2011). These

results might further indicate that supporting the development of such skills can be a great potential for addressing the time pressure and constraints highlighted in both the interviews and literature (i.e. Dalton, 2013; Daei et al., 2020) as a limiting factor inherent in the acute hospital setting and the medicine discipline that has impacts on clinical professionals and medical students' information seeking and behaviour. These skills can be taught by librarians and in collaboration with medical academics. Several learning activities can be taken to foster the students' time and information management skills. These include encouraging medical students to utilise the available reference management tools to administer their medical information resources effectively and efficiently, training them to devise their approach to storing medical information and data systematically, exploiting innovative storage tools like cloud storage and motivating them to create a realistic timeframe that fit properly their academic and clinical circumstances.

Synthesising information: The research found that a medical student should be able to synthesise medical information and data to create new knowledge or clinical conclusions. The findings revealed that medical students need to develop synthesis information capabilities but at various levels based on the task they want to undertake. For instance, phase (III) medical students are exposed to more complex research projects that require a high degree of synthesising information from various sources to create new knowledge. In contrast, phase (I) medical students practise information synthesising skills at a superficial level, just as rephrasing specific facts. This variety in the synthesis skill levels required by medical students is consistent with that of Walton (2009, p.24), who articulates these degrees as “synthesis can be as simple as relaying a specific fact. Synthesis can be very complex involving several sources, various media or presentation formats and the effective communication of abstract ideas”.

Despite the great value placed on learning such skills to medical students within the context of FOM revealed by almost all medical academic participants, there is still a different perception identified amongst some participants that information synthesis skills are taught by experience. Such beliefs could be a significant barrier that makes IL invisible to academia (Badke, 2011). Weetman (2005, p.460) also reported this view and found that academic staff tend to expect that students will learn IL skills “by osmosis or other mysterious methods”.

Interpersonal and communication skills: The research found that a medical student should have the ability to communicate orally and non-orally with students, academics, patients and other

healthcare professionals as well as to present and communicate information and research findings to others. The headline “Present” implies a transmissive approach to teaching and learning. This approach aligns with a teacher-focused approach phenomenographically identified by Trigwell, Prosser and Taylor (1994). In adopting such an approach, the teacher delivers information through one-way communication, including lectures and presentations. Thus, this could undermine the notion of constructive learning and encourage a more passive learning approach that could lead to surface learning (Trigwell et al., 1999). As Martin (2013) puts it, SCONUL presented IL as a straightforward developmental process. During this process, learners are described as “passive recipients of information, separated from their non-academic information experiences” (Hepworth & Walton, 2009). For this study, the “present” pillar has been changed into “communication skills” to reflect the more two-way interactions and participations that allow medical students to be more active learners who can develop and foster behavioural, cognitive and emotional aspects when dealing with information. This modification of the “present” pillar has also provided additional insights into a constructivist approach in the revised version, as confirmed by Walsh (2012), where medical students need to deeply engage with each other in more interactive learning environments like PBLs in which learning occurs through sharing and reflecting on experiences.

This fundamental change from presentation to information communication could also address the lack of social dimension of information in the revised SCONUL model, expressed by Walton (2011). By introducing communication skills, several social dimensions can be improved. For instance, medical students could become more aware that medical education is a continuous learning process. This is much stressed in the document analysis as one of the FOM’s fundamental objectives and by medical academics’ interviews as a critical attitude that should be taken into account. This can also help equip medical students with the capacity to enhance problem-solving and decision-making as transferable information skills that need to be deployed in the clinical workplace after graduation as new information context.

The move from presentation to communication also supports the critiques of the SCONUL model in terms of its Western and HE focus. Jinadu and Kaur (2014) argued that the existing IL models, specifically the SCONUL model (designed for UK higher education), do not support the understanding of IL in the workplace, particularly in developing countries. For example, they refer to the point that the fourth pillar (gather) focused on locating and accessing information resources available in digital forms with less stress on people’s undocumented experiences in the workplace as valuable information resources in less developed countries.

Introducing such communication skills in the body of the proposed model underpins the ability to access undocumented experiences, which is neglected in the SCONUL model. Participants from phase (III) repeatedly comment on the importance to orally communicate with those around them in the clinical workplace. They believe this has enabled them to access non-textual information and tacit knowledge that lie with medical consultants in Kuwait hospitals that have formed for a long time. By this way, clinicians could become more effective in applying their knowledge because they have a wider range of common information sources which include the undocumented sources in the clinical setting. This finding is also consistent with that of Addison et al. (2013) who found that healthcare professionals ask their colleagues to gain support and feedback about clinical queries when databases have no answers.

This kind of communication skills found in this study could also reflect the concept of IL in the workplace as social interaction described by Lloyd (2012, p.778) as the “person-in-practice perspective”. Lloyd (2007, p.2) further depicted the workplace “as a complex, socio-cultural practice that is discursively situated and constituted through the connections and networks between people, artefacts, texts and bodily experiences”. This seems clear as medical students socially communicate with other individuals within the clinical workplace to gain and share personal and medical experiences. In this context, medical students are not asked to process information to achieve specific learning outcomes such as writing essays. However, instead, they are expected to go through a complex process of analysing clinical information and data to execute a complex task such as making clinical decisions or developing treatment plans within specific sites.

This social practice of IL is represented in what has been identified in category (3), in which IL is defined from a more focused perspective within a biomedical context, where it is described as analysing clinical information and formulating hypotheses to reach critical decisions in a humanitarian way. Making such decisions requires social interaction between a range of individuals (e.g. medical students, junior and senior physicians, consultants) within a workplace (hospital) to carry out specific tasks, which results in what Lloyd (2012) categorises as social constructive learning. Through this type of learning, medical students do not need only to identify, use and present information ethically (as in the case of formal education setting). However, they must also share experiences and tacit knowledge and communicate through on-site activities.

Communication skills in the proposed model have also reflected significant aspects of cultural issues neglected in most IL Western models (e.g. SCONUL, 2011). Exploring this uncoded and tacit knowledge mentioned above through interacting and communicating with others in a given workplace could be one of the effective methods of learning via oral customs in an Arabic setting. These results confirm the association between learning systems and the cultural dimensions identified by Hofstede (2002) and to what extent these cultural traditions need to be taken into account while designing IL instructional programmes for specific learning groups like Arabic students (Martin, 2006). These cultural traditions, which are neglected in most IL models designed in Western societies, are widely emphasised in the Eastern literature as critical aspects of IL teaching and learning which should be taken into account before applying such Western IL models to new contexts like the FOM at KU setting (Fahmy & Rifaat, 2010; Martin et al., 2010; Moyo & Mavodza, 2016; Robinson & Bawden, 2018; Russel & Houlihan, 2017). Providing medical students with IL skills that facilitate locating information from both documented resources (e.g. online medical databases) and undocumented ones (e.g. oral evidence and tacit knowledge) enables them to make more reliable decisions based on experiential and empirical evidence in very stressful situations (i.e. healthcare setting). This finding reflects the meaning of IL suggested by Walton et al. (2022, p.4) as “a contextual way of understanding a situation which involves mobilisation of information of any kind from the codified (for example text or image) to the tacit (unwritten or even unspoken but embodied and enacted)”. In addition, it supports the statement by Hepworth and Walton (2009) that information and knowledge transmitted orally are recognised as an effective mechanism for learning.

10.3.4. Attitudinal dimension

In this study, the attitudinal dimension was found as an underlying construct of IL for developing information-literate individuals in the medical field. One of the striking findings is that all the participants have placed great emphasis on a variety of attitudes as essential for medical students to become lifelong learners and responsible for their learning, seek further information to do their academic tasks, challenge the status quo, accept views in opposition to others and to function within very stressful situations.

Interestingly, the results also found a strong association between attitudinal aspects such as intrinsic self-motivation, curiosity and determination, medical students learning in general and their seeking and gathering information. For instance, medical academics clearly express the significance of having such attitudes as crucial motivators that encourage medical students

towards performing their PBL tasks. This finding is consistent with that of Dokphrom (2010), who found that attitudinal aspects such as determination, enthusiasm and curiosity are significant IL needs of undergraduates at a Thai university identified by academics and students as a necessary component expected to form the personality of an information literate individual. These aspects are also explicitly recognised in information-seeking behaviour studies and models (e.g. Kuhlthau, 2004).

As mentioned above, although attitudinal aspects are critical to the students' IL learning, they are neglected in most IL models and frameworks. However, the ACRL framework has addressed this issue through integrating what are called "dispositions" into each frame. In the ACRL framework document, these lists of dispositions are identified as components "which describe ways in which to address the affective, attitudinal, or valuing dimension of learning" but it is recommended that "these lists should not be considered exhaustive" (ACRL, 2016, p. 8). Therefore, Foasberg (2015) suggests that it is not necessary that these dispositions fit all local contexts well when the framework is used by libraries for designing their instructional practices, but new attitudinal aspects may be added to the list. By examining the ACRL's dispositions, it has been found that there is a large similarity between the attitudinal aspects identified in this study and those embedded into each frame of the ACRL.

For example, both (ACRL & the proposed model in this research) are intended to maintain and enhance open-mindedness as an essential attitude for information literate individuals in order to accept the varied and conflicting perspectives. Also, medical students explicitly reported that placing much emphasis on reinforcing the value of respecting others' views and ideas is corresponding to that disposition "respect the original ideas of others" identified in the ACRL framework (2016, p. 17). For this study, however, medical students need to be more open-minded to broaden their thinking with the aim of considering all possibilities of patients' treatment plan within the clinical situation. The disposition "value intellectual curiosity in developing questions and learning new investigative methods" identified in the ACRL framework (2016, p. 19) strongly aligns with what medical students need to develop as curious information literates the field of medicine. The FOM student participants explicitly suggest their need for being curious to seek further information to keep up with the latest medical developments. However, values such as "being patient, dedication to teaching, having initiative" are identified as contextual and disciplinary-related attitudes for medical students to maintain with the context of medicine. This is not discussed in the ACRL framework.

This finding broadly supports the work of other studies in this area linking emotional aspects with IL teaching and learning. For example, Nierenberg (2022) recently found a strong connection between attitudes (feelings) and students' IL learning. Thus, she suggests it is more valuable for IL educators and practitioners to integrate this aspect into their IL instructional activities, practices and assessments to prompt students' attitudes towards their learning and maintain this interest over time. However, this result has not previously been described in most IL definitions as well as models and frameworks (Gumulak & Webber, 2011), and as a result, these emotional aspects have been neglected from most IL models and standards with competency-based structures (e.g. SCONUL, 2011; ACRL, 2000 & ANZIL, 2004) (Secker & Coonan, 2011; Walton, 2017; Gumulak & Webber, 2011). For instance, Walton (2011) criticised the revised version of the SCONUL model for not addressing emotional dimensions. An explanation for this missing might be the influence of the outcomes-based approach to education widely used in Western Countries (Buchanan & Hyde, 2008). This approach emphasises competition and efficiency highly demanded in the workplace dominated by Globalisation and neoliberalism orientations. This approach tends to promote the cognitive dimension of learning to the detriment of other aspects, such as attitudinal and spiritual ones, despite their complementary roles in the learning process (Buchanan & Hyde, 2008). Therefore, this separation of non-cognitive dimensions may not lead to a holistic approach to IL and, consequently, might not achieve transformation, an essential attribute of IL learning.

This result also reflects those of Johnston and Webber (2005, p.112), who stated, "In terms of local and national culture, the information literate person is a self-, and socially-conscious being, rather than a simple repository of skills and knowledge. This is underlined by cross-cultural differences, where issues of behaviour and acceptability of kinds of information become sensitive". The recognition of the significance of the emotional side in the development of IL identified in this study is a critical indicator which must be seriously taken into account by those who are guided by Western IL models and standards (e.g. SCONUL) in designing their IL teaching and learning practices within the context of the Middle East and GCC countries (Houlihan et al., 2016; Sandercock, 2016; Martin et al., 2010; Pullman, 2016; Johnston et al., 2014; Shana & Ishtaiwa, 2013; Al-Aufi & Al-Azri, 2013; Ashoor, 2005). The role of attitudinal aspects cannot be overlooked in developing information-literate medical students at the FOM.

One interesting finding is that medical academics focus on how medical students should show a great attitude towards teaching each other, a crucial element they need for their future careers

in the clinical setting. This attitude could lead us to recognise a close relation between IL and another new significant attribute, such as learning how to teach. As mentioned in the literature reviewed, providing medical students with a better understanding of teaching principles, skills, and strategies may help them become better learners and effective communicators, which is regarded as an essential aspect of interaction between doctors and patients in the clinical setting (Dandavino et al., 2007). This study found that medical students interact with a wide range of individuals (e.g. peers, physicians, colleagues, consultants, nursing staff). Hence, they are learning and teaching at the same time. For example, while interacting with patients, they teach them; thus, this kind of education could positively impact health outcomes. Another thing is that the analysis found that medical students have continuous exposure to more interactive and participative learning environments in the FOM curriculum, such as PBLs and group discussion classes. Such learning activities require simultaneously acquiring skills and competencies associated with teaching and learning. These findings underline that facilitating the development of teaching skills is critical to medical students. These findings also indicate the importance of incorporating teaching skills and principles into the IL instruction curriculum within the FOM sequentially to teach medical students how to teach (Dandavino et al., 2007).

10.3.4.1. Curiosity

Participants, especially medical academics, explicitly indicated that medical students need to be curious in order to challenge medical information even if it is perceived as unchanging facts inherited in medical textual books. It is argued that this can be seen as an effective approach that enables medical students to question medical knowledge confidently which may lead to opening new discoveries and insightful inquiries. This closely matches much of the notion of information discernment which is part of IL identified by Walton (2017). He defines it as “The ways in which social, psychological, behavioural and information source factors influence peoples’ judgements about information” (p. 151). One of these factors that affect how individuals judge knowledge state and shape their worldview is “epistemic beliefs”. It is concerned with the way through which people “are comfortable with encountering contradictory information, and those who become anxious in the face of contradictory information and believe knowledge is constituted of immutable facts to be digested and learnt” (Wong, Walton & Bailey, 2021, p. 366-367). Epistemic beliefs are exhibited in two forms: “as scientific curiosity...and as the perception of knowledge as unchanging facts” (Walton, 2017, p. 150). Pointon et al. (2023) found that there is a relationship between the level of information discernment and curiosity. For example, those who have a low level of information

discernment lack curiosity by not interrogating the whole article. These findings grounded in the literature support the results from this study that the more medical students' level of information discernment increases, the more they are able to evaluate, judge and assess medical information and facts without any anxiety. Furthermore, this also confirms Walton's (2017, p. 151) assertion that people's awareness of the contested nature of information, and their ability to question, is fostered by enhancing people's information discernment.

10.3.5. Information implementation and application

In this research, information implementation is a critical attribute that information literacy strives to accomplish in the medical field. It is defined as the ability of medical students to apply medical and clinical information and knowledge to the patients in the clinical and EBM setting, which is the ultimate goal of medical education. This finding is consistent with that of Dalton (2013), who used the revised Seven Pillars model (SCONUL, 2011) to develop a lens reflecting the information needs of a specific group in the healthcare setting. Dalton found that "integrating the best available clinical evidence with clinical expertise and patient preferences" (p.39) is critical information ability for healthcare professionals to be developed in the context of EBP, which was inserted into the "Present Pillar". However, for this study, the participants from medical academics with sufficient expertise in the EBM approach clearly expressed that the "Present Pillar" seems more used in academic than clinical settings (see section 8.3.4). Therefore, it was suggested that "Present Pillar" could be replaced by "information implementation and application" to fit the context of EBM to allow medical students to reflect on their specific information needs in the healthcare setting.

10.3.6. Summary

The research has demonstrated that becoming information literate in the context of FOM requires interplaying many dimensions: behavioural and cognitive (doing, thinking), attitudinal (feeling), and knowledge (knowing) to achieve the ultimate goal of medical education related to successful application and integration of medical and clinical information, evidence and knowledge with clinical expertise and patient healthcare. For example, medical students need to be aware of medical terminologies regarded as essential knowledge requirements expressed as keywords which are supported by intrinsic motivation and determination as key attitudes in order to construct a search strategy for accessing and locating information considered as critical skills before making the right decision in the clinical context. Another example could be that to communicate effectively with their colleagues and clinical staff, medical students require good basic science and English language knowledge supported by attitudinal aspects such as

open-mindedness and initiative. The above examples articulate the close interaction among all these dimensions to become information literate within the context of the FOM and cannot be treated as discrete aspects. This relationship between all three aspects can be summarised in the following Figure 10.2.

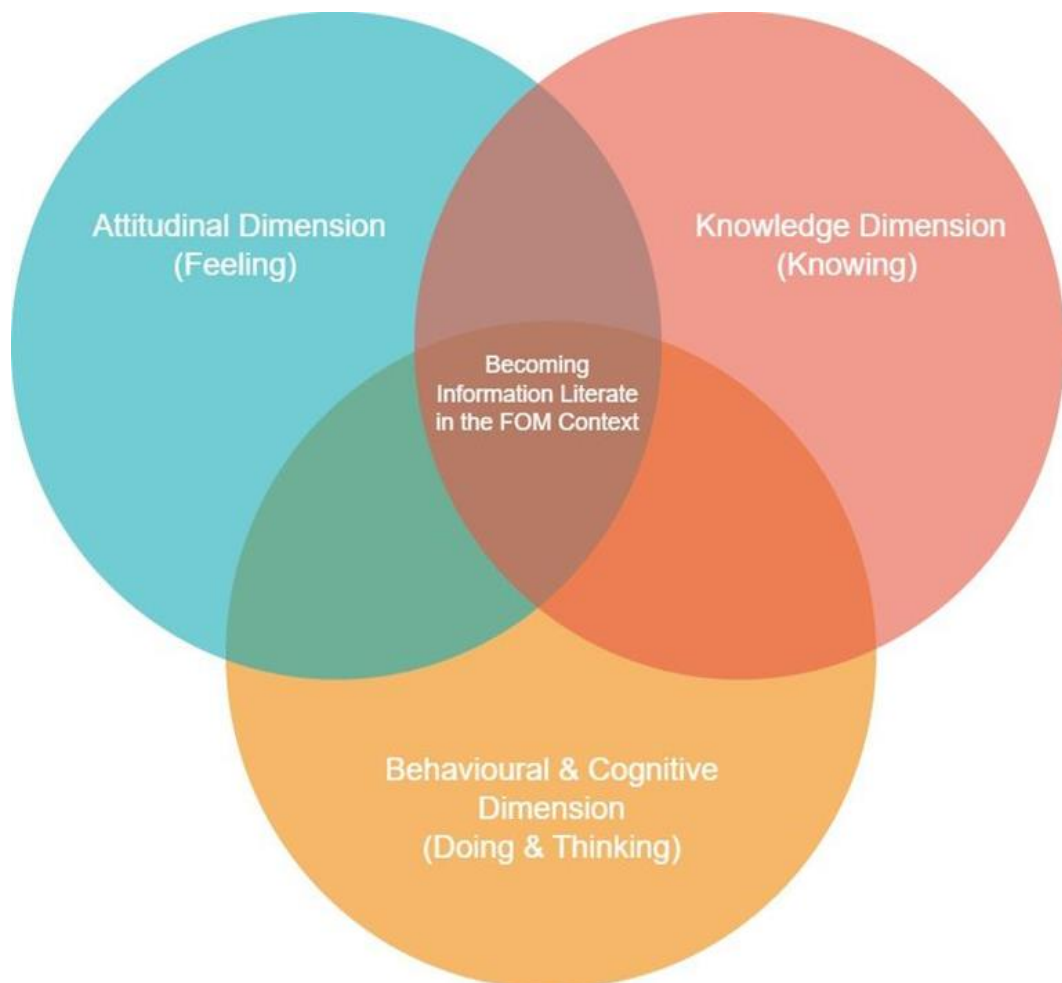


Figure 10-2 Information Literate Students: The Context of The Faculty of Medicine at Kuwait University

10.4. The role of corporeal information

In reviewing the literature, Lloyd (2009) highlights the role of information modalities in shaping information literate individuals. Three different sources of information were identified. These are “epistemic (codified and textual information), social (tacit), and corporeal (from the body)” (p. 411). All of these information sources seem to be critical to medical students in order to become information literate within the context of the FOM and clinical healthcare setting as explicitly mentioned by the participants.

Lloyd (2009, p. 415) reported that “the body plays a central role in learning about work-place practice”. This is asserted by medical students through emphasising their need for using their bodies to represent information physically which cannot be done textually in the clinical setting. Body language which is regarded as corporeal information in this study is reported by phase (III) medical students as an essential skill that facilitates presenting conceptual medical information within the context of everyday morning meetings in hospitals. This assertion chimes more with Lloyd’s (2009, p. 408) findings in their study of ambulance workers, that “observation of bodies in action was reported by experienced practitioners as a critical source of tacit and contingent information”. Medical students in this situation experience corporeal information in the same way as those of Lloyd’s (2009) study; as an “observation of bodily practices” (p. 415).

This finding also suggests that medical students need to perform body language in order to facilitate understanding social sources of information. These sources are characterised by Lloyd (2009) as tacit and situational and cannot be adequately outlined in all explicit forms (such as textual information). There is clear evidence in the interviews that corporeal information is more important than textual information in the clinical site. This finding is consistent with that of Lloyd (2009) who argued that “textual sites have less importance for on-road practitioners who focus more on information as it is experienced through physical and social sites...textual information was perceived as having less value in facilitating the transition to professional practice” (p. 413).

Corporeal information is also perceived as an critical source to medical students but in a slightly different setting. This situation is to do with their professional practices after graduation in their clinic and dealing with patients. Medical academics placed much emphasis on how medical students start gaining information from the bodies of patients within the context of a clinic. They explicitly reported that in such a setting, bodily interaction (eye contact) with the patients is considered the departure point that physicians need to employ prior to commencing gathering

textual information. This means that the patient's body is positioned in the centre of their professional information practices. This finding broadly supports the work of Lloyd (2009) in this area that links conceptual information with real-life information confirming that “the body becomes the location for the intersection between conceptual information and information drawn from real life” (p. 415).

Medical academics also suggest the idea of how corporeal information provides initial theoretical background for medical students to search for textual information. This result seems to be largely similar to that of Lloyd (2009) who argued that “textual information is acknowledged as providing the initial theoretical “framework”... allowing experienced practitioners to anchor theoretical (know what/why) information with experiential information (know-how)”. (p. 413). In this study, corporeal information is experienced by medical students as the same as Lloyd’s (2009) participants as the “linking codified textual information with physically accessed information” (p. 415). It has also been suggested that the patients’ bodies are seen as assessment tools (Lloyd, 2009). However, this does not appear to be the case in this research. This could be because participants were presented with the SCONUL model during the interview process: the model overwhelmingly favours textual information and might have shut down more information of this type being shared. Finally, corporeal information is seen as a critical component fitted into the model devised in this research which is regarded as the departure point before gathering the required textual information to analyse clinical information. It is also included in one of the categories of IL conceptions “Taking clinical decisions in a humanitarian way” category identified in this study.

10.5. Information literacy education within the context of the FOM

10.5.1. Introduction

This section discusses the state of pedagogical approaches used in the FOM to support the development of IL. It also highlights librarians’ role and identity as teachers within the FOM context and links this study’s findings to the existing literature.

10.5.2. Pedagogy for information literacy

The third research question in this study sought to explore the existing state of ILE in the FOM. The results have shown that medical students are exposed to very few opportunities to develop their IL skills and acquire IL knowledge through formal and informal education. Within the context of the FOM, IL instruction is considerably delivered through one-shot sessions given particularly during the first semester in the first year. The pedagogical approach for IL at the FOM as one-shot session is similar to the state of IL instruction in various libraries affiliated

with medical schools in Canada and the United States, as found by Nevius et al. (2018). Teaching IL as a one-shot session seems to be inadequate to develop medical students' IL skills as repeatedly commented on by phase (II & III) medical students. There are similarities between attitudes expressed by medical students towards IL provision in this study and those described by Conlogue (2019) who found that traditional one-shot IL classes represent passive learning experiences for students, resulting in low levels of IL retention to be used in their future careers in the context of evidence-based patient care.

The study also found that IL is not fully integrated into the curriculum at the FOM. This could be because of many reasons as found in this study. For example, limited space in the curriculum with specific learning objectives identified by medical academics can be one of the major obstacles that hinder medical academics from delivering IL to students. However, there is evidence in the literature emphasising the importance of embedding ILE in the curriculum in order to enhance IL skills. In the context of health and medical science, Ullah and Ameen (2019) argue that integrating IL skills into the medical curriculum as an independent and credit course at all levels requires proper planning and successful collaboration with faculty. For instance, the nature of PBL approach, which has been found as one of the most effective teaching and learning methods of fostering IL in this study, can be one suggested recommendation that helps decision makers in the FOM to integrate IL into the curriculum and that facilitates the collaboration between librarians and faculty. This is in line with McKinney's (2018) idea of the role of IL in IBL approach, which would be closely related to a PBL curriculum (as adopted in the FOM). For this study, time pressure has also been identified as the biggest challenge that affects all medical students' IL development and excellence. Using a flipped classroom as an asynchronous teaching method in a context such as medical and clinical setting, where time pressure and information overload are common, can also be a practical suggestion to deliver IL content in the stressful medical education context (Conlogue, 2019; Epstein et al., 2019; Muellenbach et al., 2018; Tagge, 2018).

10.5.3. Librarians' roles as teachers

As reported in section 7.5.1., librarians are involved in the ILE process at the FOM through a variety of teaching approaches (e.g. training programmes, individual & group training sessions, guides & tutorials, current awareness, orientation programmes). The results revealed that librarians are not fully engaged in ILE and therefore they are described as trainers as reported in the findings. This seems to be very clear from the recurrent term "training" identified in the analysis of documents, the library's website and the librarians' interview transcripts. Hicks and

Lloyd (2022) are very clear in their assertion the type of discourses existing in LIS literature could constitute a barrier and create resistance “among teaching librarians who can be seen as attempting to rebuild their role within the community through sharing practical know-how and understanding” (p. 422). Despite the importance of fostering the notion of librarian-teacher identity and inviting librarians to involve in teaching methods and gaining pedagogical knowledge identified in the literature (e.g. Becksford, 2022; Hays & Studebaker, 2019; Kirker, 2022; Wheeler & McKinney, 2015), the analysis has shown that the librarians do not view themselves as teachers but as trainers. There are several possible explanations for this result which are closely in line with the literature.

One reason why librarians do not see themselves as teachers in this study could refer to the explanation suggested in Wheeler and McKinney’s (2015, p. 122) study that it is “to do with their level of qualification, and their conception of teaching being a complex and high-level skill” or to that reason identified in Kirker’s (2022) research that the librarians are reluctant to describe themselves as teacher because of both their deeply grounded identity as librarians and teaching faculty’s attitudes towards them.

The findings also suggest that the reason behind why the librarians described themselves as trainers might be associated with the nature of ILE delivered to medical students by the librarians, which is limited to lower-order IL skills but not to do with enhancing information evaluation and critical thinking abilities. The need for developing such abilities are clearly reported by phase (II & III) medical students in the interview transcripts because they are highly required for the success of constructivist pedagogies such as PBL method which has been recently widely introduced into medical curricula in the FOM. This suggests the findings reported by Linton (2016) that medical librarians need to adopt new emerging teaching roles such as educators, change agents, and problem solvers within the medical school curriculum context. Engagement in the scholarship of teaching and learning has a critical impact on the librarians’ identity to see themselves as teachers and to gain knowledge and expertise in the teaching and learning context (Hays & Studebaker, 2019).

The shift in their role from librarian to teacher and development of their understanding of pedagogy can create a good relationship with the faculty in the FOM particularly within the context of PBL. This confirms Kirker’s (2022) argument that such a relationship leads to “constant negotiation of instructional responsibilities and impacts how librarians view their roles as teachers” (p. 338). This will support a special kind of liaison with academics about

how IL should be taught, which can in turn result in overcoming some affecting factors such as lack of guidance about how to teach PBL and lack of academics' experience in teaching IL. Additionally, this could alter the perception (held by the faculty and the librarians in this study) that is learned by experience.

10.5.4. summary

The research has demonstrated that a one-shot session is the most predominant approach through which ILE is delivered to the medical students in the FOM. The study also found that the role played by librarians in teaching IL within the context of FOM is limited only to training. Therefore, their identity is described as a trainer but not as a teacher, which could affect their attitude towards gaining teaching knowledge.

Chapter 11 Conclusion

11.1. Introduction

This chapter aims to cover the following sections: providing a brief overview of the research and a summary of the research aims and questions and how they have been addressed, reflecting on the contribution of this research to existing knowledge, identifying the implications of the findings for practice, highlighting the research limitations and finally making recommendations for future research.

11.2. Research overview

IL was coined in the 1970s. Since then, it has been widely defined by both scholars (e.g. Webber & Johnston, 2007; Bruce, 1997) and organisations (e.g. SCONUL, 2011; ACRL, 2000, 2015; CILIP, 2018) predominantly in Western societies. In order to develop information-literate individuals, these organisations developed a range of IL models and frameworks to act as educational guidelines for teaching IL skills, competencies and knowledge. However, these models and frameworks have been widely criticised for many reasons. For example, they were developed from the perspectives of the librarians and within the context of libraries. Thus, the expected learning outcomes could not be generalised to the other specific learner groups, settings and disciplines (Boon et al., 2007). They have also neglected the emotional and attitudinal aspects of the learning outcomes (Walton, 2017) and the role and influence of cultural and contextual factors in the attributes of being information-literate individuals (Johnston & Webber, 2005).

Arabic and GCC countries have not yet developed IL frameworks and models (Russel & Houlihan, 2017). This means they must depend on the above-mentioned Western models in designing their IL learning interventions and programmes (Houlihan et al., 2016; Moyo & Mavodza, 2016). However, these Western models are not based on the Arabic and GCC cultural and educational contexts. Therefore, the primary aim of this research has been to develop a model of IL for the FOM at KU. In order to achieve this aim, the following research questions were formulated:

RQ1: How do medical academics, students, and librarians of the FOM conceptualise IL within the context of KU?

RQ2: What is required of medical students to become information literate?

RQ3: What is the existing state of ILE within the context of the FOM?

RQ1: How do medical academics, students, and librarians of the FOM conceptualise IL within the context of KU?

Interestingly, all the participants in this study perceived the IL phenomenon differently in a single setting (The FOM). They exhibited different concepts and ideas about IL. Their descriptions of IL have been categorised into three main categories: (1) core competencies, (2) higher-order cognitive and critical thinking skills, and (3) taking critical decisions in a humanitarian way. It can be concluded that the participants’ awareness towards IL has increasingly become more focused and specific from category (1), experienced in a wide range of contexts, to category (3), experienced in limited situations. These categories are shown in the following figure 11.1.

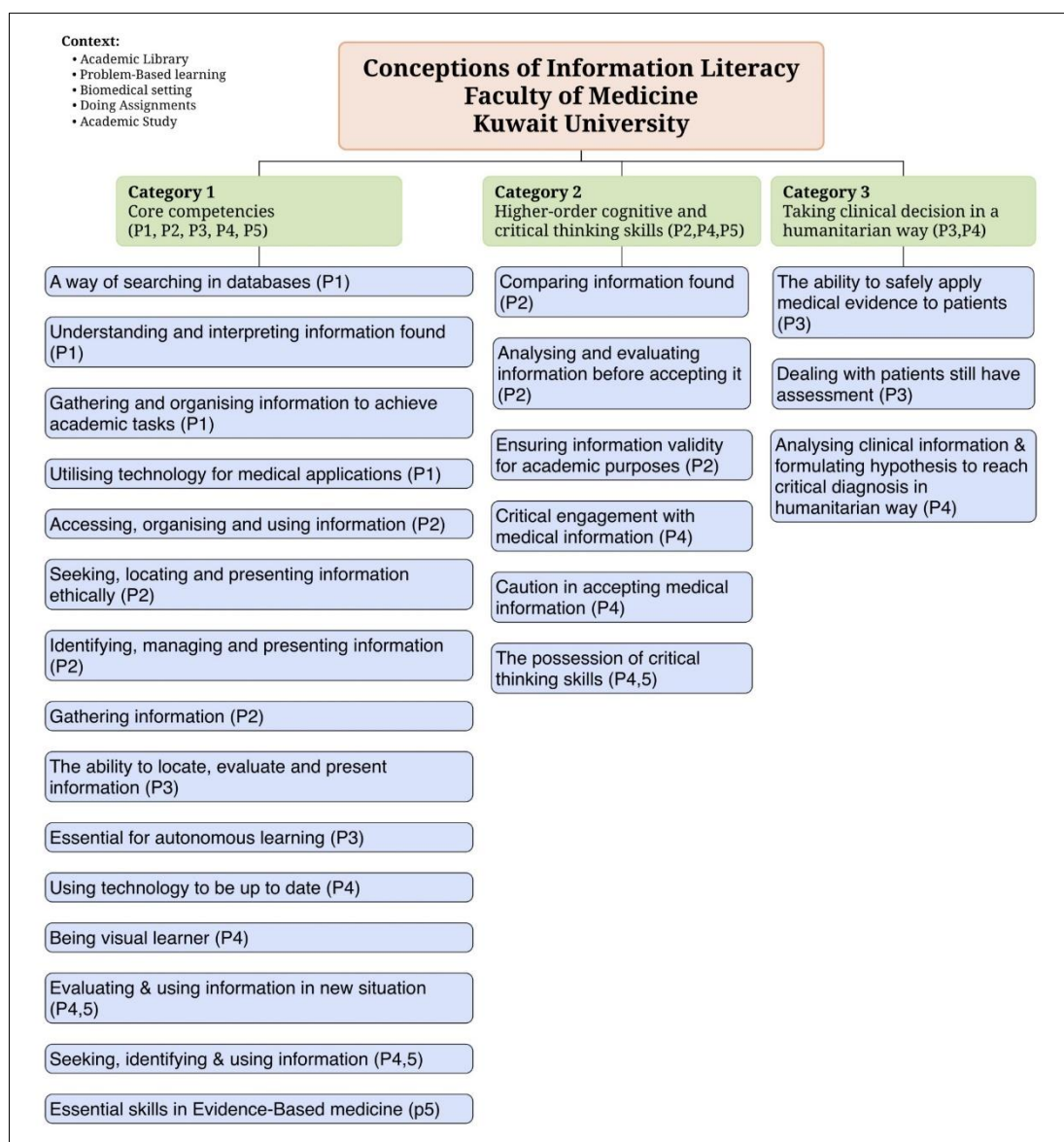


Figure 11-1 A holistic view of Information Literacy Conceptions within the context of The Faculty of Medicine at Kuwait University

RQ2: What is required of medical students to become information literate?

The study found that three aspects shape an information-literate individual within the context of the FOM, including knowledge (knowing), skills (doing and thinking) and attitudes (feeling). The components of these aspects interplay closely to achieve the ultimate educational goal in medicine that aims at implementing information in the research and clinical situation. These aspects are shown in the following figure 11.2. which is explained in detail in section 10.3.

Attitudinal components which are not expressed in the IL models and frameworks developed by LIS leading bodies (e.g. ACRL 2000, SCONUL 2011, ANZIL 2004) have been found in this study as essential elements in order to become information literate within the context of the FOM. However, the ACRL framework (2016) has addressed this issue by integrating the dispositions for each frame, which are identified as attitudinal components. The framework emphasises addressing IL within HE and the learning community. As noted by Foasberg (2015, p. 709), “Most of the contexts of interest to the Framework are academic; the title of the Frame “Scholarship as Conversation” makes that abundantly clear”. Hence, this contrasts the model from this study, which seeks to address IL in both academic and biomedical workplace settings, which is regarded as a more complicated context.

Participants also emphasised possessing discipline and context-specific knowledge as critical aspects of information literacy. For example, they focused on the importance of acquiring English language knowledge within the context of the FOM. This is because of the nature of medicine, taught in English in most medical institutions including FOM.

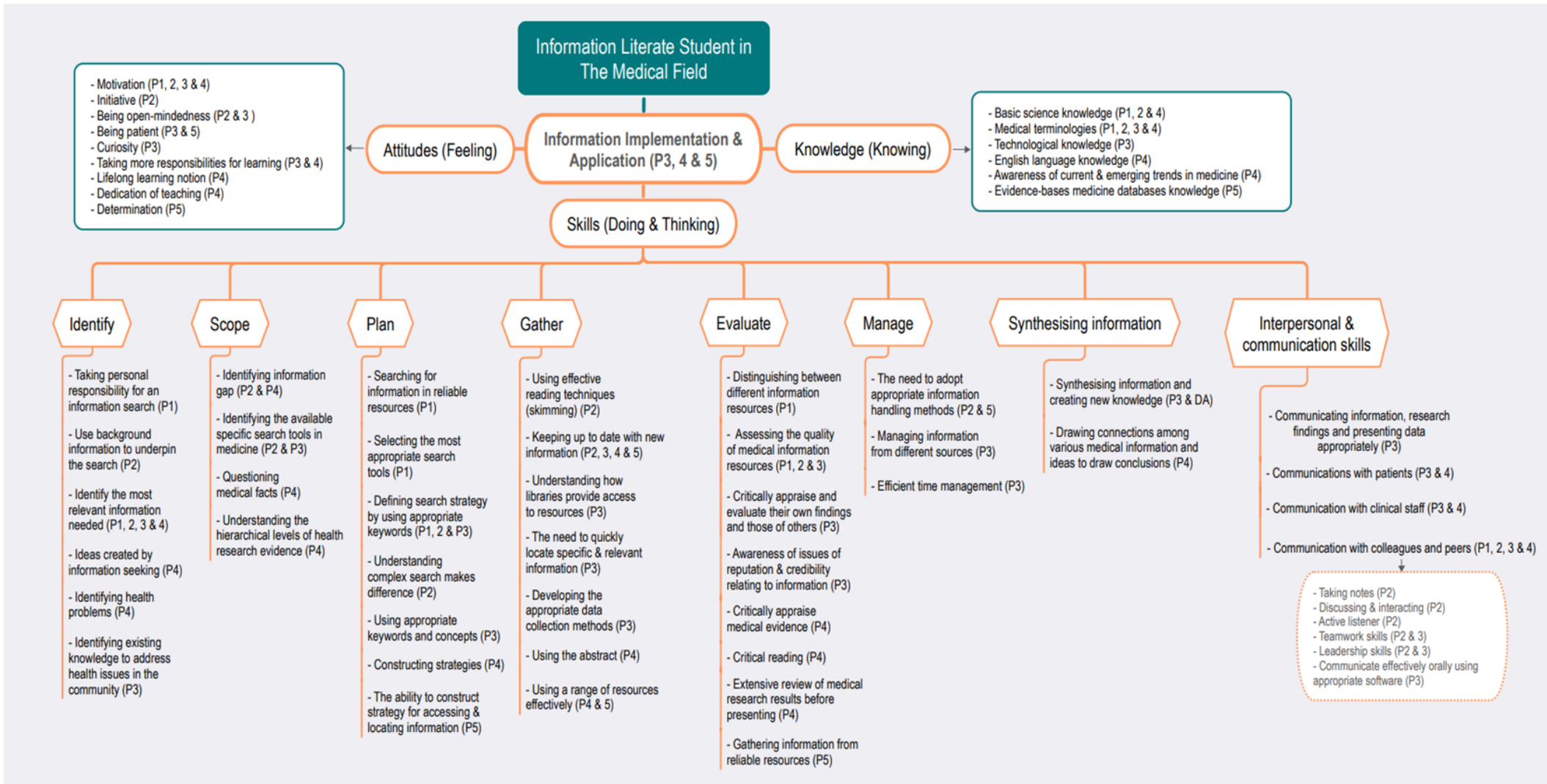


Figure 11-2 A holistic view of Information Literacy Aspects of an Information Literate Medical Student within the context of The Faculty of Medicine at Kuwait University

RQ3: What is the existing state of ILE within the context of the FOM?

The results of this investigation have shown that medical students have few opportunities for learning IL skills. However, participants saw IL as a critical element in achieving the FOM's vision and mission, as well as for the success of critical courses and subjects like PBLs and EBMs. Most of these opportunities are provided in the first semester of the first year, taking the form of one-shot sessions in the library orientation and one-semester credit-bearing class, as shown in figure 11.3. These learning interventions aim to develop IL skills at lower levels, including navigating specific medical databases and evaluating medical websites using specific criteria such as CARS. Then, the learning outcomes are assessed practically, both formally and informally, by taking the short test format. The findings have also indicated that medical academics play a role in teaching IL through several learning activities, including practical sessions, PBLs and classroom activities. All of them occur at personal levels without any attempt of official inclusion in the curriculum, as well as taking the form of low levels such as giving advice and encouragement.

Medical academics view IL as an essential component for medical students having a positive impact on their future careers as well as patient outcomes. However, factors such as academics' resistance to teaching IL, lack of medical academics' experience in teaching IL and limited space in the curriculum with specific learning objectives are perceived as significant barriers to hinder the medical academics' abilities to teach IL. In addition, medical academics' perceptions, such as that IL is someone else's job and learned by experience, may have a negative influence on the process of ILE within the context of the FOM.

Due to the lack of pedagogical opportunities for teaching IL in the FOM, the participants indicated several significant skills and competencies found as shortcomings that need to be developed, including information evaluation skills, creating the appropriately formatted bibliography, the formulation of the research project topic and synthesising and summarising various information in the research.

This study has identified several factors, such as a lack of genuine interest in ILE by the administration, lack of integration into the curriculum, budget limitations, lack of experienced professionals and lack of technical facilities that are regarded as the most prominent barriers hampering the provision of ILE within the context of the FOM. These obstacles and barriers are similar to those identified in Arabic and GCC regions in the literature (Ashoor, 2005; Fahmy & Rifaat, 2010; Houlihan et al., 2016).

Furthermore, factors such as educational background, time pressure, getting the information from the tutor, no new IL courses in phases (II and III), and lack of extrinsic motivation have been recognised as the most common barriers within the FOM that could have effects on the medical students' development of IL.

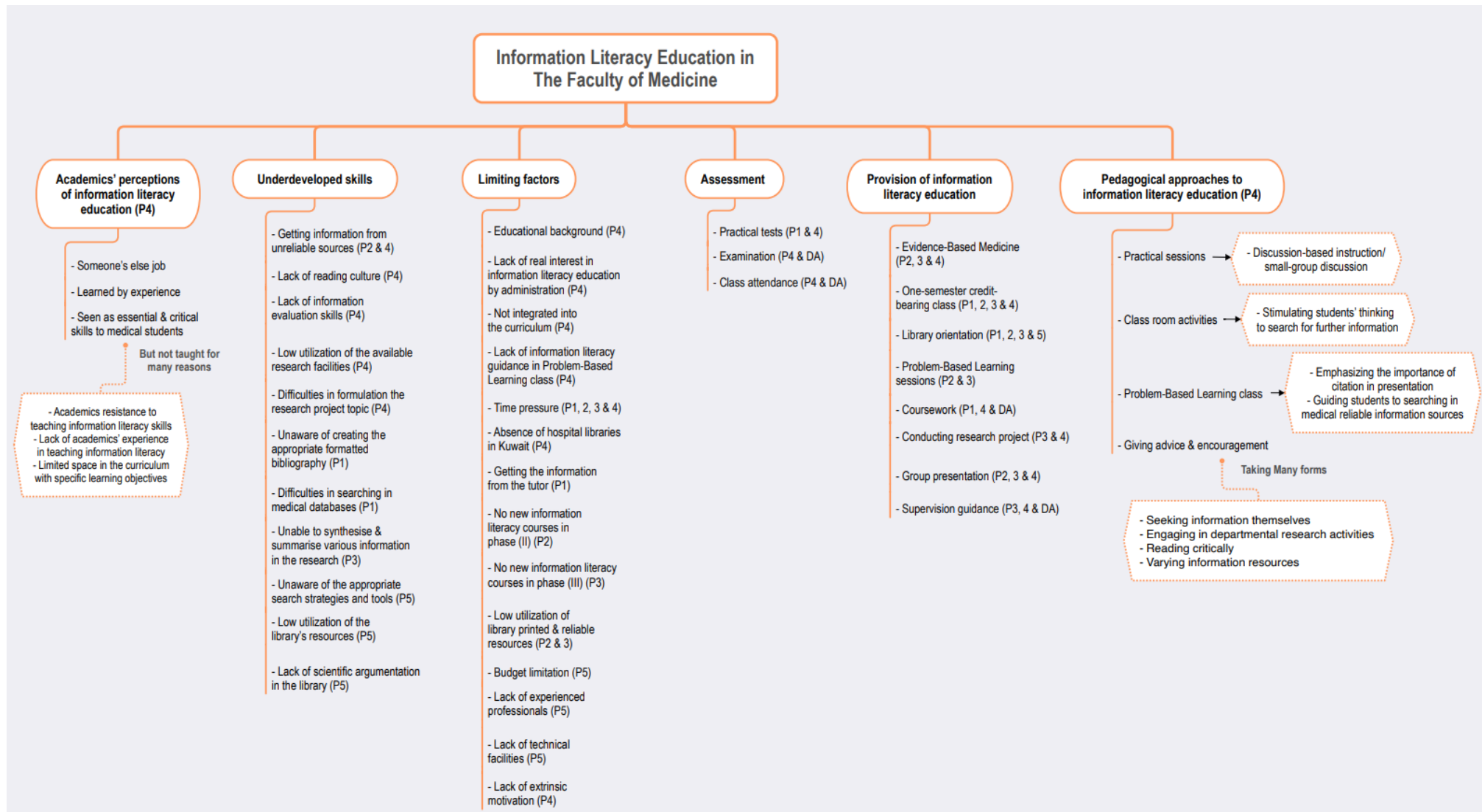


Figure 11-3 A holistic view of Information Literacy Education Status within the context of The Faculty of Medicine at Kuwait University

11.3 Contributions to knowledge

This section explains how this research has made a significant contribution to knowledge at the level of theory, methodology and practice as follows.

11.3.1. Theoretical contributions

The findings from this study make several theoretical contributions to the current literature. First, this work contributes to existing knowledge of IL by developing the IL model in the Arabic region and GCC. The current study is one of the few empirical research exploring the IL phenomenon in the Arabic region (i.e. Alhuraiti, 2022; Al-Issa, 2013; Leshner, 2002; Salha, 2011). This study has taken up new critical themes related to IL that have not previously been discussed in Arabic literature. These include (1) the development of the IL model in the Arabic region, (2) the conceptions of IL in the medical sector, and (3) the influence of IL model development on the learning of medical students.

Despite the remarkable progress in IL literature in Western societies (e.g. Bruce, 1997; Boon et al., 2007; SCONUL, 2011; ACRL, 2016; CILIP, 2018), the research into IL and its conceptions, practices and applications in terms of the development of IL models and frameworks in Arabic contexts is very limited (Simon, 2013; Tokarz & Bucy, 2019) and thus requires further exploration. The current research attempts to address multiple gaps in the literature and, in doing so, makes significant contributions. Based on the reviewed literature as well as the researcher's best knowledge, this study is the first attempt aimed at developing an IL model in Arabic, GCC and Kuwait contexts. Therefore, it has made a significant theoretical contribution to the field of IL by closing the gap in the literature; that is, those in the Arabic region and GCC countries have not yet developed their own IL models and frameworks. Thus, this model developed in this study could be used as a departure point to illuminate the way for those in this region to take it as guidance on developing their own IL models and frameworks.

The idea of developing the IL model in the Arabic region and GCC has been adopted for the first time in this research. Despite being considered a unique and contextual model, it is more likely to be used and applied in other cases that share similar factors in Arabic educational and medical institutions. It will also enhance the decision-maker's understanding of the role and the impact of IL models and frameworks on the students' learning and their productivity in the workplace after graduation. Furthermore, the present study lays the groundwork for future researchers in the Arabic region who are interested in a similar focus or willing to test the applicability of the developed model or to extend the findings of this research.

Second, this study has also made a theoretical contribution to the SCONUL model adaptation by making significant modifications and changes, as explained below, to fit the context of the FOM at KU. Due to the absence of IL models and frameworks in the Arabic region, the reviewed literature revealed that the current IL practices in the majority of HE institutions in the Middle East and GCC are guided and shaped by Western IL models and frameworks such as ACRL (2000) and SCONUL (2011) (Houlihan et al., 2016; Sandercock, 2016; Martin et al., 2010; Pullman, 2016; Johnston et al., 2014; Shana & Ishtaiwa, 2013; Al-Aufi & Al-Azri, 2013; Ashoor, 2005). However, It is argued that these models are unlikely to be appropriate and applicable to all cultures and societies such as the GCC and Arabic region without considering the contextual factors. These variables must be considered when teaching IL as they affect how people learn in non-Western contexts (Dorner & Gorman, 2006; Dorner, 2017). As a result of using the SCONUL model as an analytical framework in analysing the empirical data of this research, further contribution has been made to the established written knowledge through testing the applicability of the SCONUL model (developed in a Western context) in culturally different contexts such as Arabic region.

Wilkins, Neri and Lean (2019) argue that just applying the existing theory or model in a new context is not enough to contribute to knowledge. However, the explicit adaptation of the existing model must be made in order to be used in the new setting. Therefore, this study goes further than just testing the SCONUL model in a new setting to involve modification of the model, as explained in the discussion chapter (see section 10.3.3.), in order to be well fitted in the context of the FOM at KU as well as within the clinical workplace in Kuwait hospitals. For example, the “Present” pillar in the SCONUL model has been broken down into other pillars, such as “synthesising medical information and clinical evidence”, “interpersonal and communication skills”, and “Information implementation and application” in order to accommodate a wide range of context-based higher-order information abilities.

Third, the present study has confirmed the importance of attitudinal aspects which are missing in most IL models and frameworks developed by leading bodies such as SCONUL (Walton, 2011) despite their importance in the IL learning process in the Arabic settings. The present study has made an additional contribution by supporting the above views where attitudinal elements were identified as an integral part of being information-literate individuals in the medical field, confirmed by all perspectives (academics, students, librarians). These results also asserted the significance of the attitudinal aspects in the process of the development of

information-literate individuals explicitly mentioned in some empirical studies (see Dokphrom, 2010; Nierenberg, 2022).

11.3.2. Methodological contributions

This research is regarded as one of the few empirical studies investigating the IL phenomenon in the Arabic region from multiple perspectives as a triangulation of multiple data sources using a set of data collection methods. Therefore, using these different methodological techniques enhances the validity and reliability of the model developed in this study as Kuwaiti health lens based on SCONUL Seven Pillars. This can also be recognised as a methodological contribution because it is unlike most IL models developed by lead bodies which are based on a single perspective derived from only the librarians' opinions and experiences. In addition to the best researcher's knowledge and based on the reviewed literature, this is the first empirical study in the Arabic region, GCC and Kuwait adopting multiple data sources (academics, students, librarians and documentation) to investigate IL phenomenon.

The findings showed that case study approach could be used to surface conceptions of a phenomenon. This approach proved useful in expanding our understanding of how this was done through semi structured interviews probing people's opinions and experience of IL. The findings that describe the participants' experiences towards IL phenomenon in three categories closely similar to those identified in studies using the phenomenographic approach can be seen enough as a methodological contribution to the case study approach. As previously discussed in section (3.13.1, Step 4 reviewing themes), although the participants were given a pre-existing model and concepts with the aim of removing the ambiguity of IL terms, it was surprising that they described their experiences and conceptualised IL differently. This took place through a case study approach whose primary research focus is not to explore the individuals' experiences about a specific phenomenon. Such categories could prove its usefulness in expanding our understanding of how IL conceptions can be discovered and explored through using other different methods, such as case studies and will be of interest to those who are concerned about investigating IL conceptions in different disciplines and contexts.

11.3.3. Practical contribution

The findings of this research could have significant practical implications at different levels as follows.

11.3.3.1. Information literacy pedagogy

The developed model delineated the characteristics of being information literate within the context of the FOM by outlining the most attitudinal, cognitive, behavioural and knowledge

aspects that medical students need to develop. Therefore, it can be used by librarians and educators as a roadmap and a framework to inform the design and structure of IL teaching programs for medical students at KU. More specifically, it can help determine the students' information needs and the type of training programme content based on their different learning requirements according to their different levels and phases. It can be recognised that their learning and information needs increasingly become more sophisticated as they progress in ascending order.

Based on the results, medical students exhibited different levels of IL needs. Therefore, unified sessions and classes provided only in the first year may not meet their advanced information needs for the subsequent phases. The established model may be helpful as a diagnostic tool to determine students' specific IL needs. This may help design more IL-targeted instructional programmes that address factors including: context, students' roles and the nature of the tasks that shape how medical students of different phases receive information. In this way, medical students would reach the top in a systematic and more structured way that fulfils their learning requirements.

The proposed model supports the holistic approach to information literacy by blurring the lines between IL and other literacies, such as academic and medical literacies. This view provides insight into the role of practitioners in revising their IL teaching practices to incorporate other literacies into their IL pedagogical work.

Results revealed that the current IL curriculum in the FOM has overemphasised functional skills (e.g. finding a journal paper or searching in a database) at the cost of other learning experiences which can promote deep learning. Therefore, IL teaching interventions need to consider all aspects of information learning experiences with a particular focus on higher-order information skills, e.g. analysing, comparing and synthesising.

11.3.3.2. The FOM Librarians

The results indicated that the role of the librarians is limited to just providing information services and offering an induction session for newcomers in the first semester of the first year. Nevertheless, findings such as lack of IL guidance in PBL classes, lack of academic experiences in teaching IL and the academics' perceptions towards ILE as "someone else job" suggest that librarians have a significant role in designing IL teaching and learning as well as in supporting the academic staff, particularly in PBL environment where IL is seen as an integral part of its success.

11.3.3.3. The decision-makers at the FOM

Although the results showed that IL plays a significant role in achieving the FOM's vision and missions and medical students' learning, there are very few opportunities to support medical students' IL development within the context of the FOM. Thus, these findings have significant implications for the decision-makers in carefully considering the value and importance of IL for medical students. This study has raised important questions about the nature of ILE programmes in the FOM, which should be integrated into the objectives of the curriculum at all levels and not just in the first semester as one-shot sessions.

11.3.3.4. The decision-makers at the Ministry of Education in Kuwait

Bundy (2004) emphasises that the development of IL is of a sustainable nature that should go across all educational levels: primary, secondary and tertiary. For this study, medical students and academics repeatedly refer to the educational background, which was found, among others, as a negative impact that affects the students' IL development and the level of their critical and analytical thinking. Therefore, the findings of this study can go beyond the boundary of the FOM to have implications for policymakers in the Ministry of Education in Kuwait to rethink critically the value of teaching IL to students from early educational stages in schools.

11.4. Recommendations

Drawing on the findings of this study, a set of recommendations are suggested for the librarians to support the development of IL teaching practices within the context of the FOM.

- It has been noted that the quality of IL teaching and learning is strongly related to the identity through which librarians see themselves. However, the results of this research revealed that the FOM's librarians view themselves as trainers. Therefore, these findings support strong recommendations to offer pedagogy-based courses to the librarians in the FOM library as continuing professional development programmes. This could impact on the ILE practices in the FOM environment, because a relationship was found between pedagogical knowledge gaining and teacher identity (Becksford, 2022).
- The results indicated that attitudinal aspects are recognised as an integral part of the conceptions of information literate students identified within the context of the FOM. This information can be used to develop IL instructional programmes aimed at enhancing such critical components for the learning of medical students.

- PBL curriculum has been found as one of the best provisions of ILE that engage medical students in activities that develop their IL skills, but the role of the librarians in such an approach remains completely absent in the FOM. Thus, These findings suggest several courses of action for the librarians in order to develop their understanding of such a significant pedagogical approach to teaching and learning IL. By doing so, more valuable opportunities would be created for the librarians to discuss with the faculty the role of IL in PBL curriculum and how it should be taught. This kind of interaction and collaboration may also potentially contribute to embedding IL into the curriculum at the FOM all levels and not only at a surface level.
- Both time pressure and limited space in the medical curriculum with specific learning objectives are identified by the faculty and students as the most factors affecting the development of IL instructional programmes within the context of the FOM. A reasonable approach to tackle this issue could be by adopting more constructive and blended pedagogical models such as flipped classrooms which in turn facilitate medical students to prepare and gain first exposure prior to class.

11.5. Guidance for the medical school academics

Many studies in the literature demonstrate that PBL curriculum supports the development of IL and is considered as an effective approach to teaching IL (e.g. Dodd, 2007; Eskola, 2005; Santharooban & Premadasa, 2015). Within the context of the FOM, however, PBL curriculum is not assessed and evaluated, as repeatedly and explicitly reported by the medical academics. Consequently, this causes a central issue to medical education in general and IL improvement in particular because medical students do not see PBL as a critical part of their education. These findings can be used by the medical academics to revise the PBL curriculum in order to design appropriate assessment tools that promote their students' learning. They can also be seen as practical implications that provide medical academics with practical support and guidance to develop their summative and formative assessment instruments which are a central part of motivating students' IL learning.

11.6. Research limitations

This research is subject to three key limitations which are described next. The first limitation is related to the issue of the result being transferable. The data in this study were gathered from a single case study (The FOM) at KU. Therefore, it is thought that the knowledge produced from this study only relates to the case under investigation. However, Oates (2006) argues that despite the uniqueness of some factors of the case study research, other typical factors can be

found in similar cases. Thus, the results can be transferred to another case. This transferability is accompanied by giving the reader sufficient detail about the case under study to let her/him decide to what extent it is similar to their cases. To that end, the researcher of this study provided a very thick description of the context and the case (see chapters 4-8).

The second limitation is associated with the COVID-19 pandemic. Although the pandemic did not influence the sample size, it did have an impact on the way through which the data were collected. As explained in the methodology chapter, the data were collected by face-to-face and online methods. So, the pandemic had effects in both ways. Regarding face-to-face, the participants and the researcher wore face masks and kept their distance during all the interviews as a way of preventing the spread of the pandemic. However, these measures like face mask wearing could have negative impacts on social interactions and communications by impairing better facial expressions and vocal information recognition (Aguillon-Hernandez et al., 2022) as well as physical comfort (He et al., 2021), which both would reflect on the process of the interview as a whole. In relation to online interviews, technical issues related to the Internet quality, to some extent, had effects on some of the free-flowing conversations that were beyond the researcher's control.

The third limitation is concerned with using the SCONUL model as a framework for this research. The SCONUL model has been criticised in the literature because it “lacks a great deal of the cognitive, emotional and recursive states inherent in engaging with information. The pillar schema is an engaging metaphor, admittedly, but it creates a misleading picture in people's minds of the IL process as an almost concrete and fixed set of stages” (Walton, 2017, p. 138). The model was used for this research in two phases: the process of data collection and the process of data analysis. The SCONUL model was exhibited to the participants before and during the interview in order to help them share their views and thoughts about IL phenomenon within the context of the FOM where IL is an unfamiliar and obscure concept. However, presenting participants with the model can be a weakness in this study which may have constrained the participants' perceptions and views on IL. As mentioned above, for instance, presenting interviewees with the SCONUL model, which overwhelmingly favours textual information, could be a limitation of this study that might prevent other types of information such as those identified by Lloyd (2009) from emerging as a critical source of information. Another limitation might also be related to employing the SCONUL model as an analytical framework through the inductive coding phase. Therefore, using such a framework in analysing data as a deductive approach may lead to concerns associated with missing much of data and

codes that do not well fit with the framework. Nevertheless the researcher was aware of the potential limitations and the ways in which the model was used are explained in more depth in the Methodology chapter (3.13).

11.7. Future research

As mentioned earlier, this research was the first attempt to develop an IL model in the Arabic region. However, it would be a fruitful topic for further research in the following areas.

The initial examination of some of the medical faculties' websites in the region of GCC, including Qatar University (<https://www.qu.edu.qa/ar/medicine>), Sultan Qaboos University (<https://www.squ.edu.om/medicine>), Medical University of Bahrain (<https://www.rcsi.com/bahrain/>), Princess Nourah bint Abdulrahman University (<https://www.pnu.edu.sa/en/Faculties/CM/Pages/Home.aspx>), Alfaisal University (<https://com.alfaisal.edu/en/mbbs>) revealed that there is a significant similarity between their visions, missions, circumstances and the used medical curriculum and that of the FOM. They divide their curriculum into three phases to support many skills and competencies identified in the model. These include developing clinical and communication skills from the beginning, fostering teamwork, enhancing student-centred, lifelong learning, critical thinking, problem-solving and research skills. However, differences have also been recognised. For example, in the context of Princess Nourah bint Abdulrahman University and Alfaisal University, there is a clear emphasis on promoting Islamic Studies and Arabic Language. The main objectives of this Islamic study course are to identify ethical and unethical practices, face multiple ethical dilemmas, and list the essential principles of research ethics from an Islamic perspective. Hence, a single case study approach employing the method of focus group discussion with a group of academic staff and librarians due to their role and involvement in ILE is suggested as further research to find out to what extent the established model is transferable to the contexts mentioned above.

New humanitarian-related values that emerged in the biomedical context have been added to the concept of IL. This is different from the values (such as legal and ethical use of information) previously used in IL definitions. Thus, further research, mainly using phenomenographic approaches, is required to investigate how IL is experienced by those who are working in the clinical workplace because a better understanding of how IL is conceived forms the basis for designing ILE programmes for those who are operating in such specific contexts.

11.8. Reflection on my research

The aim of this section is to reflect on my experiences during the entire PhD research journey. Based on a systematic review conducted by Marshall (2019) reflection is considered as a contested term which is widely defined in the literature. Kolb (2014) cited in Marshall (2019, p. 397) defined it as “The internal transformation of experience”. This is closely in line with what I want to articulate in this section regarding my feelings and the changes happening to me in terms of both the developments as a researcher and my understanding about IL phenomenon. During my research journey, I noted how my belief as a student who was immersed in an education system that is largely based on information memorisation and fact calling has changed to someone who believes in the idea that knowledge is provisional and changeable that needs to be examined persistently. Reviewing and synthesising the literature also has a vital role in developing my research skills such as gaining adequate knowledge about any particular topic and identifying the research gap that is required to be divided.

Participating in teaching activities during my research journey (such as acting as tutor in the University of Sheffield’s information literacy module) has changed my view, to see myself as a teacher rather than as a librarian who just provides information services to the users during my previous professional career in Kuwait. Such practical experiences have shaped my view of teaching and learning and influenced pedagogical knowledge regarding using IL models (i.e. SCONUL) in designing IL instructional interventions. I realised during my research that a single definition of IL cannot be generalised to all contexts without considering the other contextual factors such as language and cultural influences. This has changed my view of IL that the descriptions of IL conceptualisations should be contextualised and situated.

My ontological and epistemological stance has shaped the way in which I collected and analysed the data in this research. IL is seen as a social phenomenon where multiple actors hold different perspectives about it in specific settings. This made me collect the data from a range of participants (academics, students & librarians) in order to investigate IL conceptions from multiple perspectives within the context of the FOM. In addition, my epistemological view that IL is a reality existing within individuals’ thoughts and feelings has affected my choice of qualitative methods in terms of data collection and analysis in a subjective way. Covid-19 pandemic was one of the major challenges I faced during my research. However, several measures were taken to mitigate the negative impacts particularly during the data collection

period. For example, some health steps such avoiding close contact and wearing face-mask were taken during conducting face-to-face interviews.

As a PhD student I developed important skills in, and knowledge about, research and teaching. For development of my teaching, working with highly qualified academic staff in teaching information literacy to MA students over the long spring semester (as mentioned above) was particularly valuable. I will be able to use this experience in designing a pedagogical intervention in my future career as an academic tutor in Kuwait. The findings from my research have also enriched my understanding of how students perceive their teaching, and information literacy. This is also something I can use in my practice and I can spread this knowledge and understanding in my interaction with the region's library and information professional networks.

11.9. Final remarks

This study has found that IL is a critical component which contributes to the achievement of Learning Objectives for Medical Student Education Guidelines for Medical Schools documented in the Association of American Medical Colleges mentioned above (Golenko & Arh, 2020) which are already adopted by the FOM at KU. The model developed in the current investigation supports the development of IL which in turn helps improve medical students' abilities from multiple aspects: attitudes, skills and knowledge grounded in IL and medical and healthcare literature. The increasingly rapid changes in medical discipline raise a critical question about the model's potential to satisfy medical students' IL learning requirements in such a constantly evolving healthcare context. However, the study has contributed to existing knowledge of IL in the Arabic region and the medical education context, and provides a building block for development of further research in the region.

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Appendices

Appendix (1): Interview protocols

Questions for academics:

- 1- Tell us your name?
- 2- What is the module or class you teach?
- 3- What are the learning outcomes or goals of what you are teaching?
What is “information” for your subject?
What are the information sources you depend on in teaching activity?
- 4- How does IL help achieve learning outcomes for your module?
- 5- How do you assess your students’ learning outcomes?
Do you think IL contributes to that assessment?
- 6- How do you expect your medical students to be information literate in the medical field ?
- 7- What skills do you think medical students need to acquire to be information literate in the medical field?
- 8- What are the challenges and barriers for medical students becoming information literate?
- 9- Do you help your students to be information literate?
If so, How do you help them?
Being taught or demonstrated in class/when, can you show us any example?
Is IL one of the class objectives?
- 10- What do you think of the SCONUL IL model?
- 11- What IL skills do medical students need now and in the future that are not represented in this model?
- 12- What kind of skills do you think important to your students?
Is IL one of these skills and one of PBL class objectives?
(based on Seven Pillars IL standards provided) What are the most significant aspects of IL do you think they need?
- 13- What role do you play in teaching IL skills?
Do you help or support individual students who have inquiries or problem? If so how?
Referring students to other people or resources
Recommending good source of information
- 14- What are the strategies you have employed to cultivate IL skills in teaching?
Are these skills being assessed? If so, summative or formative? Can you please show us any examples?
Do you engage your students in IL? if yes, how. If no, why?
Do you collaborate with librarians? If yes, how. If no why?
- 15- In your opinion, what is the most significant factors that have an impact on the effective deployment and implementation of strategic IL programmes in the Faculty of Medicine at KU?
- 16- When you think of “information literacy” concept, what comes to your mind?
- 17- What does the term IL mean to you within the context of medical faculty ?
Why did you describe it in that way?
- 18- Before we conclude this interview, is there something about your IL experience in this college that you think influences how you practice in your classes that we have not yet had a chance to discuss?

Questions for library personnel within the HSC

- 1- Tell us your name?
- 2- What do you think of the SCONUL IL model?
Based on the SCONUL Seven Pillars of Information Literacy Model, What are the most significant aspects of IL do you think medical students need?

- Do you think this model covers all aspects of IL required by medical students now? If not?
 What the aspects of IL is missing in SCONUL model that are the most required by medical students?
 In your opinion, what IL skills do medical students need in the future that are not represented in this model?
- 3- To what extent do you think IL is important to medical students in achieving their academic attainment?
 - 4- How do you expect medical students to be information literate in medical field ?
 - 5- What kind of skills do you think important to your students in achieving their academic attainment?
 Is IL one of these skills?
 - 6- What are the challenges or barriers for medical students becoming information literate?
 - 7- What role do you play in teaching IL skills in the context of the faculty of medicine at KU ?
 Do you help or support individual students who have inquiries or problem? If so how?
 Referring students to other people or resources
 Recommending good source of information
 - 8- What are the strategies you have employed to cultivate IL skills?
 Are these skills being assessed? If so, summative or formative?
 Can you please show us any examples? Do you engage your students in IL? if yes, how. If no, why?
 Do you collaborate with medical academics? If yes, how. If no why?
 - 9- In your opinion, do you think that IL programs are effectively and comprehensively applied in the faculty of medicine?
 if so, what is the main activities?
 If not, what is the most significant factors that have an impact on the effective deployment and implementation of strategic IL programmes in the Faculty of Medicine at KU?
 - 10- When you think of “information literacy” concept, what comes to your mind?
 Why did you describe it in that way?
 - 11- What does the term IL mean to you within the context of the faculty of medicine?
 - 12- Before we conclude this interview, is there something about your IL experience in this college that you think influences how you IL practice in Library that we have not yet had a chance to discuss?

Questions for students:

1. Tell us your name ?
2. What is your study phase in the Faculty of Medicine at KU?
3. What is your study year?
4. How do you rate your academic achievement at university?
5. Can you give examples or situations when you need information?
6. How do you get that information you need?
 Asking librarians, tutors or consulting databases etc.
7. What do you think of the SCONUL IL model?
8. What IL skills do medical students need now and in the future that are not represented in this model?
9. Have you received any IL instructions or sessions during your university career?

- If so, at what phase and what IL aspects were covered?
10. What is the nature of your course works or assignments?
“if possible, the interviewee will be asked to bring their course work instructions or related document”
 11. Do you have any difficulty with the course works or assignments?
 If so, how did you solve them?
 12. Do you think you need any particular skills or training for your course works or assignments?
 If so, what aspects? How they are being taught?
 13. To what extent do you think academic tutors and librarians engage you in IL?
 14. How do you get information you need for PBL class or for other course work?
 15. Do you face any challenges when you search for information? If yes, how?
 16. What kind of challenges do you face?
 17. What is the most significant skills you need for your current phase?
 18. According to the SCONUL standards provided, What is the most significant aspects of IL you need ?
 19. To what extent do think that IL is important to your academic and medical achievement at university? How? Why?
 20. When you think of “information literacy” concept, what comes to your mind?
 Why did you describe it in that way?
“SCONUL Seven Pillars CILPIP & ALA definitions will be sent to the participants before actual interviewing”
 21. What does the term IL mean to you within the context of medical faculty ?
“to see what IL aspects have been covered and what not in the above standards”

STUDENTS FROM PHASE (3)

22. What IL skills are much needed by clinical students to achieve their academic attainments?
 Can you explain more?
 Can you give an example or clinical situation you need these skills?
23. To what extent do you think IL plays a significant role in solving clinical problems and difficulties?
 If so? How? Can you give an example?
“students are asked to share with the researcher their research project”
 What do you think the word “research project” means?
 What types of information did you depend on to conduct that research?
 How did you get that information/information resources?
 Did you face any difficulties to identify that information resources?
 What is the most difficulties you faced in doing your research? Can you explain more?
 In your opinion, what was the most research skills you needed to achieve your research project? How?
 Do you think you need any particular skills or training in order to conduct such research project?
 If so what aspects? How they are being taught?
24. Before we conclude this interview, is there something about your IL experience in this college that you think influences how you engage in your classes that we have not yet had a chance to discuss?

اسئلة موجهه لاعضاء هية التدريس

ما هو اسمك؟

ما هي المادة التي تقوم بتدريسها؟

ما هي الاهداف التدريسية والتعليمية في عملية التدريس التي تقوم بها؟

ما هي المعلومات في المادة التعليمية التي تقوم بتدريسها؟

ما هي مصادر المعلومات التي تعتمد عليها في العملية التدريسية؟

كيف information literacy تساعدك في انجاز اهدافك التعليمية؟

كيف تقوم بتقييم الاهداف التعليمية بالنسبة لطلبتك؟

هل تعتقد ان information literacy تساعدك تساهم في عملية التقييم؟

كيف تتوقع ان يكون طالب الطب ان يكون مثق معلوماتيا في مجال الطب؟

ما هي المهارات التي تعتقد ان يمتلكها طالب الطب حتي يصبح مثقفا معلوماتيا في كلية الطب؟

ما هي الصعوبات التي تعتقد يواجهها طالب الطب حتي يصبح مثقفا معلوماتيا؟

هل تساعد الطلبة علي ان يصبحوا مثقفين معلوماتيا؟ اذا نعم, كيف يتم ذلك؟

ما هو رايبك في SCONUL model ؟

من وجهة نظرك ما هي المهارات التي تعتقد طالب الطب يحتاجها وليست متوفرة في هذا المودل؟

ما نوع المهارات التي تعتقد بانها مهمة لطلبتك؟

ما هو دورك في تدريس مثل هذه المهارات؟

ما هي الخطط التي تقوم بتوظيفها في تعزيز مثل هذه المهارات؟

من وجهة نظرك ما هي اهم العوامل المؤثرة علي تنفيذ الفعال في تدريس مثل هذه المهارات؟

عندما تسمع ب مصطلح information literacy ما هو المفهوم الذي يخطر علي بالك؟

ماذا يعني لك هذا المصطلح في مجال الطب؟

قبل ان نختم المقابلة, هل هناك اي شي تود ان نظيفة؟

اسئلة موجهه لاختصاصي المعلومات في المكتبة في كلية الطب

ما هو اسمك؟

ما هو رايبك في SCONUL model ؟

من وجهة نظرك ما هو اهم جانب يحتاجها طالب الطب في هذا المودل؟

هل تعتقد بان هذا المودل يشمل كل الجوانب والمهارات المعلوماتية التي يحاجها طالب الطب الان وفي المستقبل؟

من وجهة نظر ما هي اهم المهارات المعلوماتية التي يحتاجها طالب الطب غير متوفره في هذا المودل؟

الي اي مدي تعتقد بان مثل هذه المهارات يحتاجها طالب الطب في انجاز مهامه الاكاديميه؟

كيف تتوقع طالب الطب ان يكون مثقف معلوماتيا في مجال الطب؟
ما هي المعوقات التي تواجه طالب الطب حتي يصبح مثقف معلوماتيا؟
ما هو الدور الذي تلعبه في تدريس هذه المهارات؟
ما هي الخطط التي توظفها في تعزيز مثل هذه المهارات؟
هل هذه المهارات تقيم؟ كيف؟ هل من الممكن عرض اي مثال؟
هل هناك اي تعاون مع هيئة التدريس؟
عندما تسمع ب مصطلح information literacy ما هو المفهوم الذي يخطر علي بالك؟
ماذا يعني لك هذا المصطلح في مجال الطب؟
قبل ان نختم المقابلة، هل هناك اي شي تود ان تضيفه؟

اسئلة موجهه لطلبة كلية الطب

ما هو اسمك؟
في اي مرحلة دراسية حاليا؟
كيف تقيم انجازك الاكاديمي في كلية الطب؟
هل من الممكن ان تعطينا مثال احتجت الي الحصول على المعلومات؟
كيف توصلت الي تلك المعلومات؟
ما هو رايك في SCONUL model ؟
من وجهة نظرك ما هو اهم جانب يحتاجها طالب الطب في هذا المودل؟
هل تعتقد بان هذا المودل يشمل كل الجوانب والمهارات المعلوماتية التي يحتاجها طالب الطب الان وفي المستقبل؟
من وجهة نظر ما هي اهم المهارات المعلوماتية التي يحتاجها طالب الطب غير متوفره في هذا المودل؟
هل قد تلتقيت اي دروس او دورات لتعزيز مثل هذه المهارات؟ اذا كانت الاجابة بنعم؟ في اي مرحلة دراسيه وما هي اهم الجوانب التي تم تدريسها؟
كيف كانت طبيعة تقييم مثل هذه المهارات؟ هل لديك اي مثال؟
هل تواجه اي صعوبات في اداء مهامك التعليميه؟
هل تعتقد بانك بحاجة الي دروس تدريسية وتدريبية لاداء مثل هذه المهام؟
الي اي مدي تعتقد احصائي المعلومات ومعلم المادة قام بتعليمك مثل هذه المهارات؟
كيف تحصل علي المعلومات لاداء PBL ؟
هل تواجه اي صعوبات في الوصول الي المعلومات المطلوبة؟ اذا نعم؟ ما هو نوع هذه الصعوبات؟
ما هي اهم المهارات التي تحتاجها في مرحلتك الدراسية؟
ما هي اهم المهارات والجوانب التي تحتاجها في هذا المودل؟
عندما تسمع ب مصطلح information literacy ما هو المفهوم الذي يخطر علي بالك؟

ماذا يعني لك هذا المصطلح في مجال الطب؟

اسئلة موجهة لطلبة الكليتك

ما هي اهم الجوانب المعلوماتية والمهارات التي تحتاجها في هذه المرحلة؟ ممكن ان تشرح اكثر مع ذكر امثلة؟

الي اي مدي تعتقد ان هذه المهارات مهمه في مرحلة الكليتك؟ كيف مع اعطاء امثلة؟

ماذا تعني لك كلمة مشروع البحث؟

اي نوع من المعلومات اعتمدت عليها في انجاز هذا المشروع؟

كيف تحصلت علي تلك المعلومات؟

هل واجه اي صعوبات؟

من وجهة نظرك ما هي اهم مهارات بحثية احتجتها؟

هل تعتقد بانك تحتاج اي مهارات او تدريب معين لاداء مثل هذا المشروع؟

قبل ان نختم المقابلة, هل هناك اي شي تود ان نطيفة؟

Appendix (2): Interview protocol matrix

Interview protocol matrix	Background information	RQ1: How do medical academics, students, and librarians of the FOM conceptualise IL within the context of KU?	RQ2: what is required of medical students to become information literate?	RQ3: what is the existing state of ILE within the context of the FOM?	Ending questions
Interview questions for academics					
Interview Q1	X				
Interview Q2	X				
Interview Q3	X				
Interview Q4				X	
Interview Q5				X	
Interview Q6			X		
Interview Q7			X		
Interview Q8				X	
Interview Q9				X	
Interview Q10			X		
Interview Q11			X		
Interview Q12			X		
Interview Q13				X	
Interview Q14				X	
Interview Q15				X	
Interview Q16		X			
Interview Q17		X			
Interview Q18					X
Interview questions for librarians					
Interview Q1	X				
Interview Q2			X		
Interview Q3			X		
Interview Q4			X		
Interview Q5			X		
Interview Q6				X	
Interview Q7				X	
Interview Q8				X	
Interview Q9				X	
Interview Q10		X			
Interview Q11		X			
Interview Q12					X
Interview questions for students					
Interview Q1	X				
Interview Q2	X				
Interview Q3	X				
Interview Q4	X				

Interview Q5	X				
Interview Q6	X				
Interview Q7			X		
Interview Q8			X		
Interview Q9				X	
Interview Q10				X	
Interview Q11				X	
Interview Q12			X		
Interview Q13				X	
Interview Q14	X				
Interview Q15				X	
Interview Q16				X	
Interview Q17			X		
Interview Q18			X		
Interview Q19			X		
Interview Q20		X			
Interview Q21		X			
Interview Q22			X		
Interview Q23			X		
Interview Q24					X

Appendix (3): Introductory document of information literacy

Information literacy (IL):

This document is designed to act as a facilitator to IL definitions and components you may want to discuss during the interview. You do not need to be limited to these components and skills but you can feel free to comment and reflect on your experiences of IL education within medical context. The aim of this document is to help you refer to IL concepts and meanings at any time during the interview and point out IL aspects particularly within medicine-related context that not covered by this document and use different words and terminologies.

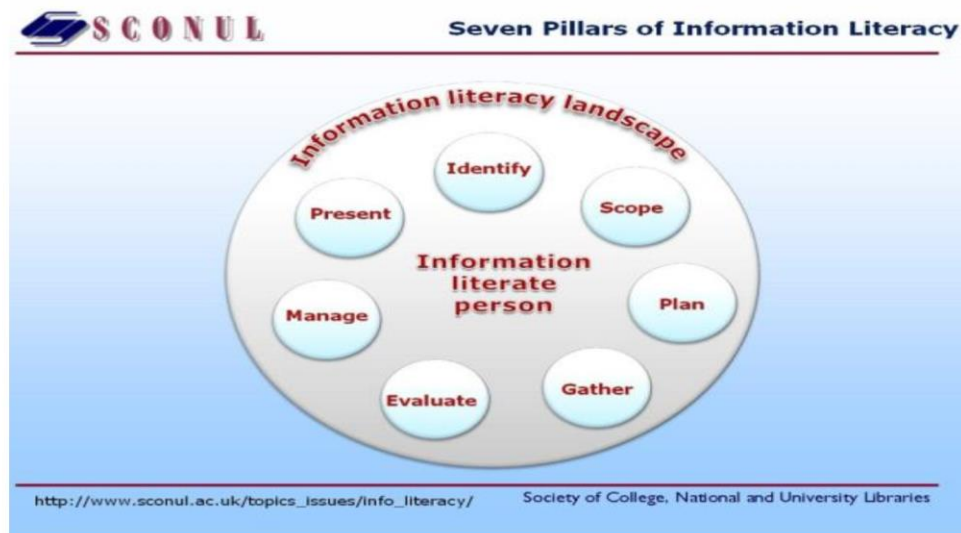
While SCONUL (2011, p.3) describes Information literate researchers and people as those who “will demonstrate an awareness of how they gather, use, manage, synthesize, and create information and data in an ethical manner and will have the information skills to do so effectively”

However, more recently CILIP (2018) defines Information Literacy as

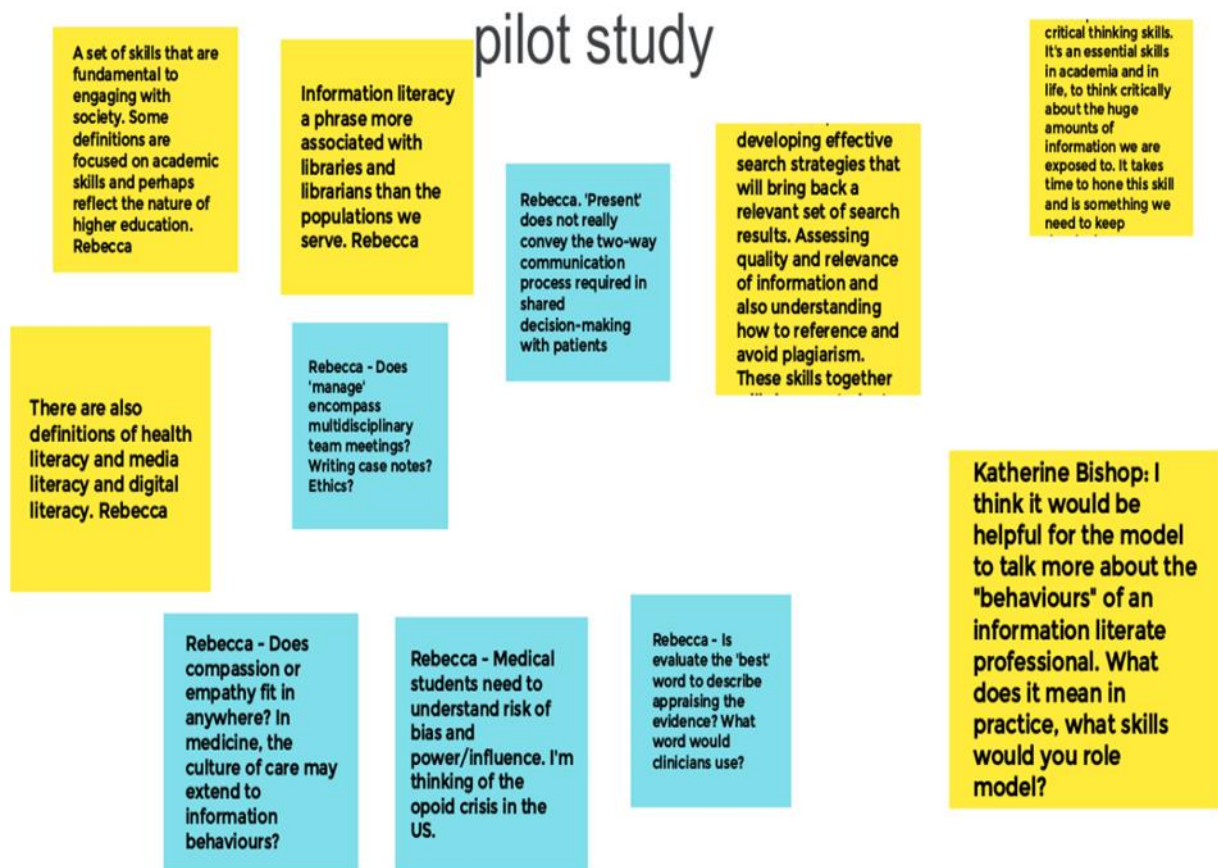
“the ability to think critically and make balanced judgements about any information we find and use. It empowers us as citizens to reach and express informed views and to engage fully with society” (Coonan et al., 2018, p.3).

According to the description of information literate people mentioned above, SCONUL in 2011 developed the Seven Pillars of Information Literacy model in order to be used as a guidelines for IL education.

This model was designed to be used in Western contexts within higher education (e.g. the UK), so I am interested in what Information Literacy means in Kuwait for medical students.



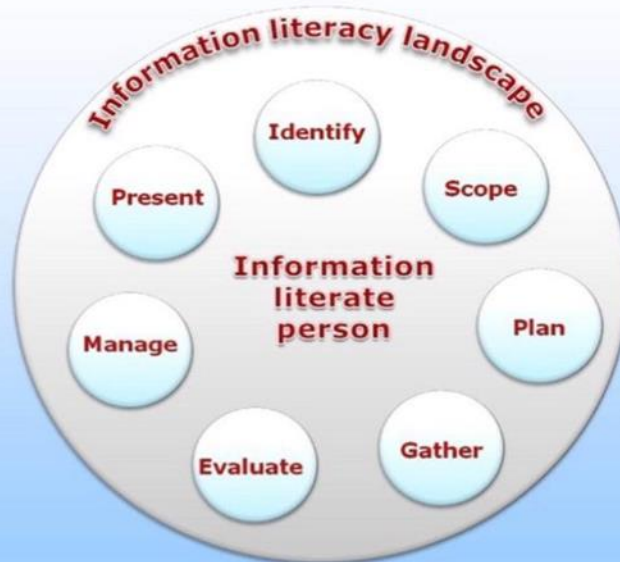
Appendix (4): Jam-board discussion of librarians pilot study



Appendix (5): Activity Checklist

Aspects of an Interview Protocol	Yes	No	Feedback for Improvement
Interview Protocol Structure			
Beginning questions are factual in nature			
Key questions are majority of the questions and are placed between beginning and ending questions			
Questions at the end of interview protocol are reflective and provide participant an opportunity to share closing comments			
A brief script throughout the interview protocol provides smooth transitions between topic areas			
Interviewer closes with expressed gratitude and any intents to stay connected or follow up			
Overall, interview is organized to promote conversational flow			
Writing of Interview Questions & Statements			
Questions/statements are free from spelling error(s)			
Only one question is asked at a time			
Most questions ask participants to describe experiences and feelings			
Questions are mostly open ended			
Questions are written in a non-judgmental manner			
Length of Interview Protocol			
All questions are needed			
Questions/statements are concise			
Comprehension			
Questions/statements are devoid of academic language			
Questions/statements are easy to understand			

Appendix (6): The developed version of Seven pillars diagram attached to the introductory document



IDENTIFY:

Able to identify a personal need for information

SCOPE:

Can assess current knowledge and identify gaps

PLAN:

Can construct strategies for locating information and data

GATHER:

Can locate and access the information and data they need

EVALUATE:

Can review the research process and compare and evaluate information and data

MANAGE:

Can organise information professionally and ethically

PRESENT:

Can apply the knowledge gained: presenting the results of their research, synthesising new and old information and data to create new knowledge and disseminating it in a variety of ways

Appendix (7): Example of using MAXQDA in the process of coding

Note: it is worth mentioning that the participant in this case was speaking both in English and Arabic. Arabic was translated because the coding process took place before the conduct of translation

The screenshot displays the MAXQDA Plus 2020 software interface. The top menu bar includes Home, Import, Codes, Memos, Variables, Analysis, Mixed Methods, Visual Tools, Reports, and MAXDictio. Below the menu is a toolbar with icons for New Project, Open Project, Document System, Code System, Document Browser, Retrieved Segments, Logbook, Teamwork, Merge Projects, Save Project As, Save Anonymized Project As, Project from Activated Documents, External Files, and Archive Data.

The main workspace is divided into two panes. The left pane, titled "Code System", shows a hierarchical tree of codes. The right pane, titled "Document Browser: MA18 (47 Paragraphs)", displays a list of paragraphs with their corresponding code assignments.

Code System Hierarchy:

- Code System (176)
 - Inf literate student in the medical field (4)
 - practical application (new lense) (4)
 - attitudes (0)
 - taking responsibilities of their own learning (1)
 - intrinsic motivation (wanting to learn) (4)
 - believing in lifelong learning notion in medical field (1)
 - dedication of teaching each other (1)
 - extrinsic motivation (needing to learn) (4)
 - skills (0)
 - evaluate (2)
 - gather (7)
 - plan (3)
 - scope (3)
 - identify (4)
 - present (22)
 - knowledge (0)
 - being aware of current & emerging trends in medicine (2)
 - the ability to master medical terminologies (2)
 - Acquiring basic science knowledge (2)
 - IL education (82)
 - academics' conceptions of IL (0)
 - category (3) framed within biomedical field (3)
 - category (2) critical thinking skills (7)

Document Browser Content:

20 In your experience, what do medical students need to be information literate in the medical context?

21 What the skills are, probably you would wonder from the answer but I think passion if if the if the student has the passion, you know they would. They would learn anything they want you know we probably a very large obstacle we face with students that they're not interested many of them.

22 They just want to pass the exams, they don't need all they care about other questions that come in the exam. So they probably don't see the need the skills as important so they want to put much effort in learning these skills. But if they appreciate their importance [the importance of IL] and they have self-motivation which must be getting out or stemming from their inside perspectives otherwise you can force it.

23 Okay, so I think this is a very important thing the student must have which it has to come from inside, this one thing

24 and another thing is that the environment you know must be okay? Meaning if I have students are willing to learn willing to be a critical thinker but the system does not help what is the benefit of their willing Okay, therefore I think both of these perspectives must come together Okay. So, maybe I think with greater emphasis on curriculum on this type of skills you know we teach the students maybe even when we examine the students the questions are based more on critical thinking rather than just based on information they have.

25 Which system do mean? Can you explain more please?

26 لا أقصد هنا في كودها هذا في كلية الطب، إذا الصائل إذا لا يعني الطلبة منذ أول ما يدخلون الكلية محاضرات، أو ورش عمل على تطوير هذه المهارات. يعني ما راح يصير يعني راح يصير إذا راحوا عند تكلمهم يشجع هذا الشيء سوف يتعلمون لكن إذا راحوا عند تكلمهم لا يراي أن هذا المهارات التي نعد سوف أن يتعلمون مست.

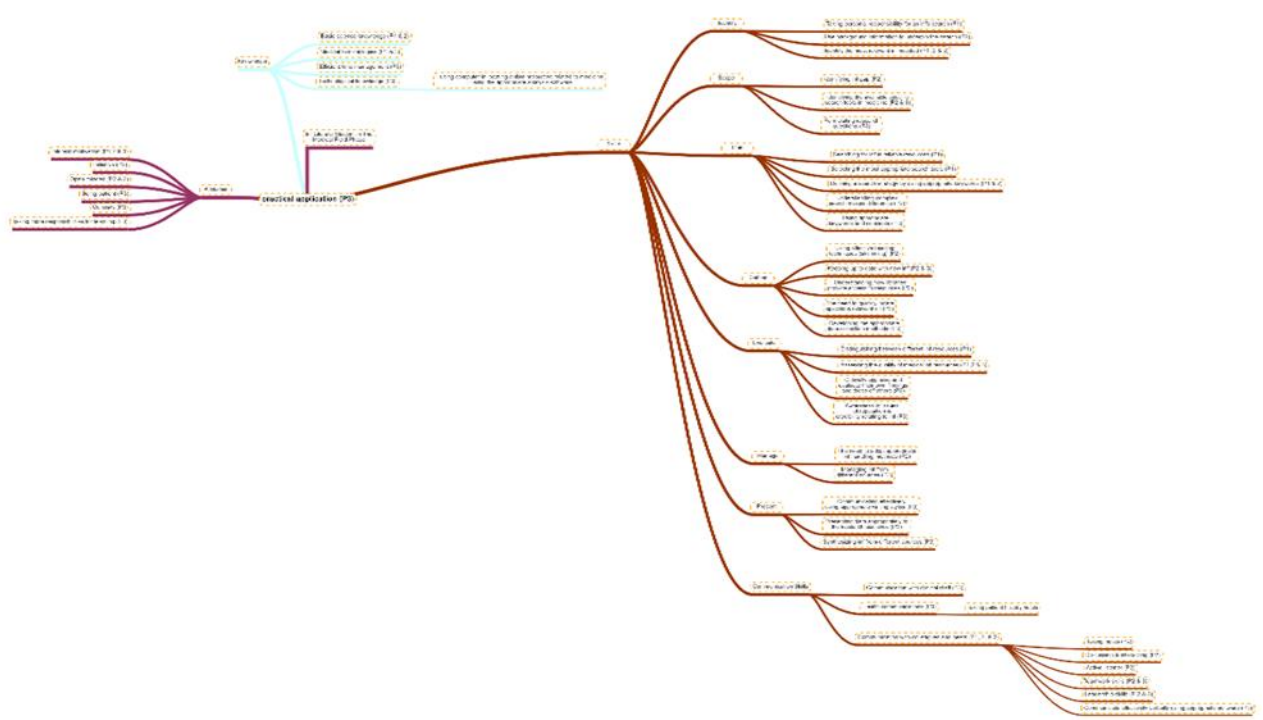
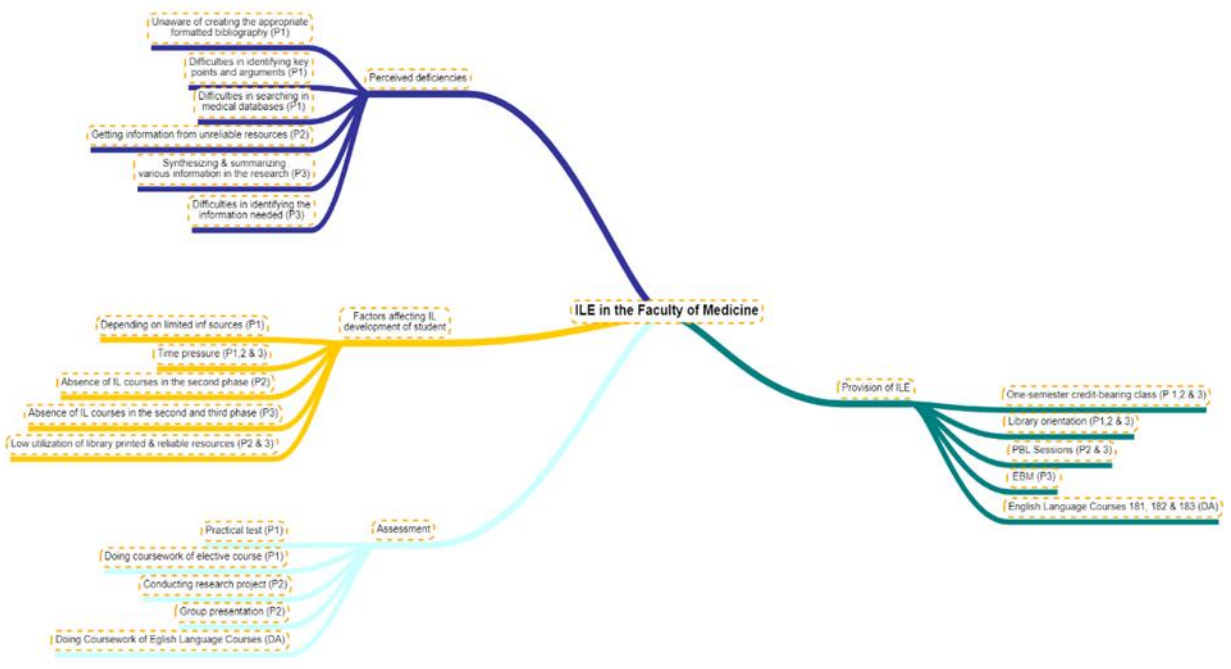
27 You know if they don't appreciate their importance from the beginning they will not learn. Because you know if they don't appreciate the importance of these skills from the beginning they will not learn these skills. I think that there is an unfortunate dependence on chance for the acquisition by medical students of such skills as they go along in the faculty of medicine. I mean if the course instructor encourages students to learn such skills, they will otherwise they won't.

28

29 I mean here in this faculty of medicine, I wonder why no administer lectures and organize workshops for medical students from day 1 in the faculty of medicine in order to contribute to the development of such skills. Because you know if they don't appreciate the importance of these skills from the beginning they will not learn these skills. I think that there is an unfortunate dependence on chance for the acquisition by medical students of such skills as they go along in the faculty of medicine. I mean if the course instructor encourages students to learn such skills, they will otherwise they won't.

30 I mean here in the faculty of medicine, I wonder why we do not give the students from the beginning they enter the faculty sessions or workshops in order to develop these skills [information literacy]. You know if

Appendix (8): Initial mind maps



Appendix (9): Description of themes and codes

Code	Definition	Examples (quotes)
Motivation	Including both the internal and external factors that drive medical students to behave or act in a particular way in order for being efficient information literate in the context of medical field.	<p>“I think it depends on the person. There is a student who actually wants to learn, and his objective goes above and beyond just passing the exam. However, not everyone has that drive or motivation to actually seek information beyond the curriculum” (P2MS6)</p> <p>“I think that the most important habit that medical students have to develop during the clinical phase is to have the passion for hospital work and being around doctors in a real-life setting, because that will reflect positively upon them in terms of the amount of information they will acquire” (P3MS10)</p> <p>So they probably don't see the need for these skills as important so they do not want to put much effort in learning these skills. But if they appreciate their importance [IL], and they have self-motivation which must be getting out or stemming from their inside perspectives otherwise you can force it” (MA18)</p> <p>“What is even worse is that the PBL module doesn't have any weight when calculating students' grades, because all a student has to do is just attend two sessions to be entitled to sit the final exam, which gives students the impression that information literacy skills aren't as important to acquire or focus upon as the memorization skills in order to successfully pass the examinations. The solution is to place equal emphasis upon the development of both PBL and memorization skills, as a combination of both will produce outstanding and creative doctors” (MA14)</p>
Initiative	This trait is seen as taking initiative to seek out additional information with the aim of learning or dividing the gap in knowledge in order	“There is also the matter of moral courage. I mean that even when you feel that your information is lacking in this field, you should have no problem asking someone more knowledgeable for help. There is no place for timidity if you want to learn, especially in the medical field, where you

	to take medical decision	are ultimately responsible for the lives of your patients” (P2MS12)
Open-mindedness	It includes the ability to be receptive to new ideas, perspectives and information without rejecting them based on preconceived beliefs or ideas. Open-mindedness can be demonstrated in a variety of ways including listening actively to others, considering multiple perspectives on a medical issue, and expecting multiple diagnosis and possibilities.	<p>“I mean we have to learn how to listen to each other, cooperate with each other and be open to other opinions that may be different from our own and consider all arguments for and against because other opinions may just be the right ones” (P3MS12)</p> <p>“As any person whether a medical student or a physician has to be broad-minded and not stuck in specific rotation and that really helped broaden our horizons, because we do not have to only focus on surgery topics during our surgery rotation or on paediatric topics during our paediatrics rotation. So, I think the key is really to keep an open mind and to go through all potential possibilities” (P3MS2)</p>
Curiosity	For the purpose of this research, curiosity is defined as the strong desire to know about the latest developments in the medical field. It is also the inclination to check the accuracy and validity of medical information and evidence before accepting it.	“...Medical students have to have healthy curiosity and always try to understand and even question the accuracy of the information they are given and not take for granted. They also need to be curious to read in-depth in order to keep updating with latest medical development and innovations” (P3MS3)
Taking more responsibilities for learning	By taking more responsibilities to develop a sense of accountability for their education and help them remain committed to gathering their information from a variety of sources and then critically evaluate it to achieve the vision of independent learning that MOF seeks to	<p>“Yes. So, unlike the preclinical years, when we were, basically, spoon-fed the information, the clinical years are about being more self-dependent and being able to develop ways to look into approved resources. So, the skills that you most need is those that enable you to recognize which databases are reliable and which aren't, because, you know, this is not a joking matter” (P3MS1)</p> <p>“But when I got to the clinical phase, I started to be more self-dependent and more involved in a self-learning process, since the syllabus was not as well defined as in</p>

	achieve particularly in clinical phase.	the preclinical phases 1&2. So, I started to search for more information in as many sources as possible so as not to be dependent upon a single source” (P3MS10) “So the lifestyle is very problematic here[Kuwait] intuitively as they need to take a learning process more serious, I think is the most important thing” (MA12,)
Extrinsic motivation	The codebook has shown an overlap between the code of motivation and extrinsic motivation. They seem to share the same values that medical students need to possess to develop a particular behaviour. Therefore, they have been merged together under one code “Motivation” In addition, this code has only been pointed out by the academics as inhibiting factors that affect medical students development of IL once the PBL activities have been ungraded. Therefore, lack of motivation due to the absence of external incentives could be subsumed under the category or subtheme of the factors affecting IL development in the context of FOM.	“In the past, PBLs had 5% of students’ total grade scores but currently this percentage has been removed from their assessment system. So now when you see students in the PBL classes, you can observe that they are not as motivated as their previous colleagues were, because they know that tutors cannot set questions in the exam from the PBL content and they will not be assessed by this content but all what they need is to attend the class. You can imagine that students just attend for the attendance sheet without any learning motivation or interest in the topic. Comparing to the situation in the past, there were some questions set in the exam from the PBL material so that students were much more motivated” (MA18) “What is even worse is that the PBL module doesn’t have any weight when calculating students’ grades, because all a student has to do is just attend two sessions to be entitled to sit the final exam, which gives students the impression that information literacy skills aren’t as important to acquire or focus upon as the memorization skills in order to successfully pass the examinations. The solution is to place equal emphasis upon the development of both PBL and memorization skills, as a combination of both will produce outstanding and creative doctors” (MA14)
Lifelong learning notion	Believing in the notion of lifelong learning is essential for medical students, as it enables them to	“In fact, not only through the first seven years, in undergraduate Medical program, no, it’s from the year one tells the graveyard once they realise that, okay, it’s a continuous cumulative process. And this

	<p>stay up-to-date with the latest medical knowledge and practices. By promoting such a notion, medical students would be motivated to seek information beyond the curriculum and to develop information skills which play a significant role in fostering the idea of lifelong learning.</p>	<p>requires , you know, being on the top of the knowledge gaining, okay, any this, it has to be implemented in their mind and their way of thinking from the beginning is not only just a course they have to pass, it's a lifestyle” (MA15)</p>
Dedication of teaching	<p>In this code, the idea of constructive learning and teaching must be promoted in the mentality of medical students from early stage. They need to develop attitude of teaching and learning each other but in honest and dedicated way</p>	<p>“They really want to teach their colleagues with honesty and dedication...in fact, in the future, as future physicians, okay, when they go to the clinic, okay, that's what they have to do. They have to learn and teach at the same time with teaching colleagues. The seniors teach the juniors...” (MA15)</p>
Determination	<p>Medical education is a rigorous process that requires persistent reading and hard work. So medical students must demonstrate a high level of determination in order to build robust knowledge-base and to develop necessary skills with the aim of becoming competent physician.</p>	<p>“A medical student must be a persistent reader in order to be able to build his own database, which is then expanded by seeing more patients in order to correctly apply theoretical information in a practical/clinical context” (Lib5)</p>
Being patient	<p>Medical students are overwhelmed with coursework, clinical rotations and other responsibilities. Being patient is important to avoid becoming burden</p>	<p>“During most of our shifts at the hospital, we have to interact with patients and professors and the main thing you have to have is a lot of patience to tide you over the work pressure and the professors’ constant demands. Only a medical student would know how exhausting work at the hospital really is especially if having to study is</p>

	through promoting persistence and a positive attitude towards learning and professional success.	combined with having to attend night shifts” (P3MS5) “A student must learn to have patience in order to successfully make the transition” (Lib4)
<p>Based on the codebook, the above different codes can be grouped together under one inclusive category or sub-theme labelled as attitude. It can be defined as a set of beliefs, interests, feelings, emotions, motivations and behaviours that constitute key component of the personality of medical student as information literate within the context of FOM at KU. These affective and attitudinal aspects are recognised as a significant element of IL (Gumulak & Webber, 2011) but are less focused in the literature of IL despite their significance for IL education and motivation (Nierenberg, 2022) as a result has been neglected from most IL models and standards (e.g. SCONUL, 2011; ACRL, 2000 & ANZIL, 2004) (Secker & Coonan, 2011; Walton, 2017). Nierenberg (2022) found that there is a strong connection between affective dimensions and students’ IL learning. Thus she suggests that it is more valuable for IL educators and practitioners to integrate this aspect into their IL instructional activities, practices and assessments in order to prompt students’ attitudes towards their learning and then maintain this interest over time.</p>		

Code	Definition	Examples (quotes)
Basic science knowledge	<p>This kind of knowledge refers to an essential understanding of underlying medical concepts, human health and diseases. This consists of several sciences and disciplines including: anatomy, physiology, biochemistry, microbiology, pharmacology and pathology. These concepts inform many aspects such as scholar discourse, information search, medical practices and providing foundation for clinical workplace.</p> <p>This kind of knowledge can be viewed as threshold concepts described in the introduction of the ACRL framework as: “core or foundational concepts that, once grasped by the learner, create new perspectives and ways of</p>	<p>“Frankly speaking, the preclinical stage is all about understanding concepts and acquiring basic information in certain sciences, such as pathology, physiology, anatomy and biochemistry, which constitute the fundamental component of medicine, without which a medical student in the preclinical stage will find it difficult to properly practise the medical profession” (P2MS9)</p> <p>“Yes, really we need to know much about science modules like biochemistry, biology, biophysics, so I guess I need to learn more these sciences in medicine and help us to search for information” (P1MS4)</p> <p>“The background is very important. You cannot identify the problem without really a good background....a good physician always releases things to the origin or the roots of the problem which always refer to the basics of anatomy, physiology or biochemistry.... the strong</p>

	<p>understanding a discipline or challenging knowledge domain. Such concepts produce transformation within the learner; without them, the learner does not acquire expertise in that field of knowledge. Threshold concepts can be thought of as portals through which the learner must pass in order to develop new perspectives and wider understanding” (ACRL, 2015, p. 9)</p>	<p>background enables you really to understand what the problem much better” (MA15)</p>
Medical terminologies	<p>This code refers to the awareness of the importance of mastering medical terms as a foundational knowledge in medical field. It is recognised as standardised language help medical students communicate effectively in the clinical workplace and consequently reducing errors and misunderstandings as well as efficiently search for relevant information.</p>	<p>“I also found the English language course and specifically the medical terminology segment very helpful. The study of Latin terms also helped me a lot particularly in the Biology course” (P1MS3)</p> <p>“Of course, the medical field is different from other fields of specialisation, because a medical student has to be fully aware of each disease-specific medical terminology and how each term is written in order to search for medical information” (P3MS11)</p> <p>“medical vocabulary are very important in medical practice because they have to work as a team when they go out to take any fellowship outside...they are able to converse with their superiors or colleagues, if they are able to converse efficiently that can do confidence to them, and they can do their best out” (MA17)</p>
Efficient time management	<p>This code is recognised as a skill medical students need to develop to overcome schedule full of learning tasks and clinical activities including:</p>	<p>The codebook has shown that this code must be moved under “manage skills” as a category or subtheme rather than “knowledge” category because it is defined as skill “doing” not knowledge “knowing”.</p>

	attending classes, completing assignments and daily hospital rotations for clinical students.	
Technological knowledge	This code involves having the basic technological knowledge of using computer and essential software such as Word, PowerPoint to do everyday learning tasks as well as advanced analytical applications like SPSS to achieve high level research projects. This knowledge is also required to navigate and use online medical databases such PubMed.	<p>“How to use the databases to get access to information resources. How to use Microsoft office tools such as word, excel, and PowerPoint” (P3MS6)</p> <p>“It is part of technological literacy, which includes how to use the computer and how to use certain Apps, such as SPSS, which is a powerful statistical analysis software, and as such can be very helpful” (P3MS9)</p>
English language knowledge	This code is related to the importance of knowing English language as it is the primary language of instruction in medical schools.	“The second thing is the instruction language, which is a very important factor, because English is the instruction language at all faculties of the Health Sciences Centre (HSC) and medical students, therefore, need not just to have good knowledge of English language but they should go beyond that to include learning medical terminologies which are specialised terminologies in that language which requires double effort” (MA5)
Awareness of current & emerging trends in medicine	This is associated with staying up-to-date with the latest developments, innovations, current research and trends in medicine. being information literate is crucial component to access more sophisticated and complicated databases developed in the USA specialised in enzyme functions as well as how to convert information into precision medicine which is the latest trend about treating diseases individually.	“I think that future medical students must be more aware of the so-called bioinformatics and more capable of searching huge databases to recover and retrieve required data. They must, as well, be more knowledgeable of modern data search technologies. For example, a medical student who needs to determine a patient’s genetic disorder must be knowledgeable on how to access highly specialised programs in the university of Arizona in the United States and how to make use of their theoretical background in their practical experiments in order to determine how the enzyme functions and what

		<p>are the causes of the enzymatic disorder” (MA7)</p> <p>“Any future medical student must know what is so-called medical practice or diagnostic medicine, meaning the ability to convert information acquired through research into a reliable basis for decision making in treating patients.... I think that what a medical student is supposed to know in order to be a good medical practitioner is how to convert information into precision medicine” (MA6)</p>
Evidence-bases medicine databases knowledge	This code is related to knowing about databases-specific medicine like EBM databases. The knowledge involves the structure of these important databases and the way of getting the best evidence.	“That is why (EBM) is equally important in medical education...EBM database is almost like a pyramid where the base represents all the available information that a student can gather on a given topic, whether surgical or pharmaceutical, and then it tapers gradually going upwards by discarding irrelevant information until you get to the top which represents the best evidence. There is active criticism of the gathered information at every step until you get to the best evidence” (Lib3)
<p>As is evident from the codebook, the above codes share similar features and qualities and thus can be grouped together under a single category labelled as Knowledge. For the purpose of this research, knowledge can be divided into core knowledge (e.g. English language, technological knowledge) and discipline-specific knowledge that is defined as the understanding of medical principles, theories and practices including diseases, diagnosis and treatments (e.g. basic science knowledge, medical terminologies, awareness of current and emerging trends in medicine). Acquiring knowledge is identified as a key element that is situated at the heart of shaping of information literate students in the medical field within FOM context.</p>		

Code	Definition	Examples (quote)
Taking personal responsibility for an information search		<p>“To be totally truthful, I did not do much research even when I was a first-year medical student and was totally dependent upon lecture notes, until I noticed that my grades were markedly inferior to those of students who were not dependent upon lecture notes handed out by professors and diversified their sources of information” (P1MS5)</p>
Use background information to underpin the search		<p>“The first session is basically a brainstorming session, so we don’t need very specialised resources, just general information extracted from simple articles. I mean Google and Wikipedia would be enough during the first session, but in the second session, you have to get your information from reliable sources” (P2MS8)</p>
Identifying the most relevant information needed		<p>“I also believe that, as a result of the huge amount of available information, medical students need to focus on and identify the most important information” (P1MS3)</p>
Ideas created by information seeking		<p>“In order for medical students to have a strong and diverse information background, they have to do their own research for their information need themselves, which is the ideal method to learn and also through which they will discover things that have not been discovered yet” (MA7)</p>
Identifying health problems		<p>“When you talk about medicine, the information should start from identifying the [health] problem when the patient comes into his or</p>

		her clinic. The first thing is maybe the eye contact... and then comes the other information, knowledge of the other diseases...” (MA15)
Identify: A medical student is able to identify a need for information to perform academic tasks or to address medical issues.		
Identifying information gap		“I believe the main thing is the scope because they [medical students] have to assess the current knowledge and identify the gap to gather the information related....in the beginning of any problem based session, they have really to identify the problem” (MA15)
Identifying the available specific search tools in medicine		“I think we need to be more familiar with sources other than the ones that immediately come to mind, such as Google, just because it's out there. However, with the medical field being in a state of continuous evolution, the situation is different and information reliability is at a premium and that is why you have to go to websites such as PubMed which can be accessed through the university network. There are also other websites which contain valuable information not available in other platforms, which we either can't access or haven't heard of because they're not used much” (P2MS7)
Questioning medical facts		“students are progressing better and more successful if they ask more questions even from the facts why this is why it should be like this because sometimes they do not go against this medical facts but if they ask so many

		questions this would lead to something else” (MA9)
Understanding the hierarchical levels of health research evidence		“eventually they should know the main types of studies used in medical research, for example, randomised control trials, single non randomised or cohort study and then they need to recognize the evidence and its strength which they can use later on whether their research or practices” (MA4)
Scope: A medical students can assess and question their current medical knowledge and facts and identify gaps.		
Searching for information in reliable resources		“The most significant skill, in my opinion, is the ability to search for information in approved sources and websites. I initially lacked this skill, which is due to the fact that I had never used this thing before I became a university student” (P1MS5)
Selecting the most appropriate search tools		“Yes, only Scopus. I did not search for example in PubMed, because it only had purely medical articles and ketogenic diet is not a purely medical topic. Scopus on the other hand is a database that has a general science orientation and is more likely to contain articles about this type of diet. I also used google scholar” (P1MS1)
Defining search strategy by using appropriate keywords		“The second question was about the advantages and disadvantages of a ketogenic diet. So, instead of typing what are the advantages of Keto diet? I only typed keywords to broaden the search and get more than one article to choose among” (P1MS4)

Understanding complex search makes difference		“The main thing is to be able to identify what is relevant, and access such information, because yeah, let’s say your research assignment is about the central nervous system. You just can’t find the required information on medical websites by simply writing “central nervous system”. You have to narrow down the search field by using very specific keywords, to get relevant information” (P2MS6)
Using appropriate keywords and concepts		“But learning how to use keywords for example is absolutely necessary, because if you don’t possess such simple search skills, you won’t be able to conduct advanced databases searches” (P3MS7)
Constructing strategies		“they should list first what type of information they should look for and what they want to look for. So, we want to look at the physiology of the heart, we want to look then at the pathology of the heart we want to look at the pharmacological aspects and so on ” (MA16)
The ability to construct strategy for accessing & locating information		“I think that they possess the basic research-related skills. I mean they know how to conduct internet searches, and how to retrieve data effectively. They should also know the required techniques for data and information retrieval and... how to use keywords to locate the appropriate articles” (Lib5)
Plan: A medical student is able to construct strategies for locating medical information and data.		

Using effective reading techniques (skimming)		“Frankly, I think that among the most important skills is the ability to skim through all related studies to determine the sources you need to complete your research project. For example, if you conduct a search of PubMed database, the search results will be too many for you to work on and that is why the skill of prioritising information based on relevance is a very important skill” (P2MS9)
Keeping up to date with new information		“Medical students must be information literate in order to be able to keep pace with the latest research works which will be key to the proper practice of their profession. But, of course, not everything will be available in secondary and tertiary sources, while the latest medical information contained in primary sources can only be accessed if you possess those research skills, which will enable you as a medical practitioner to keep up-to-date and help you make the right medical decision” (P2MS4)
Understanding how libraries provide access to resources		“We have access to PubMed without any subscription fees. We can access it through the faculty library’s computers. We also have access to all medical journals and it is all free of charge” (P3MS4)
The need to quickly locate specific & relevant information		“During the clinical phase, we need access to online resources like UpToDate sources in order to get the information on the spot, because it is hard to find the information quickly enough when you have to find it in

		text books particularly in the middle of clinical rounds or working on a part time basis. Textbooks may be the information source of choice during the preclinical stage when you have ample time to look for the information you need” (P3MS11)
Developing the appropriate data collection methods		“Following the academically correct steps in the development of such questionnaires so as to serve the research process and avoid any bias, while remaining clear for and understandable by participants. This is certainly one of the key skills” (P3MS12)
Using the abstract		“and then you read the abstract in order to see which one is the most relevant in your research and finally you read the full paper” (MA4)
Using a range of resources effectively		“I think that first year medical students experience considerable problems /difficulties in finding approved data due to their lack of any IL background, as opposed to first through fourth year students who are fully dependent on Google Search Engine” (MA6)
Gather: A medical student is able to locate and access medical and clinical information and data to meet their needs in different contexts.		
Distinguishing between different information resources		“I think the skill that is most needed is the ability to sort studies and research papers according to their respective importance, determine the information of most relevance. So, you have to develop the skills of evaluating articles and studies” (P1MS3)

Assessing the quality of medical information resources		“When we first hear how to assess the website, we know that it's reliable. When it needs that certain checklist [CARS]. It's credible, it's reliable, it's the information is not biased. We know from the website, if there is a lot of advertisement, that means that it's not reliable. Then that means it's more reliable, so we can rely on it to get information” (P1MS4)
Critically appraise and evaluate their own findings and those of others		“I mean we used to read the articles and compare the information we collected and the results we arrived at with the results of the other studies in the literature” (P3MS9)
Awareness of issues of reputation & credibility relating to information		“I rely exclusively upon textbooks and websites such as UpToDate and never used sites like Wikipedia for fear of presenting the wrong information to students in class. However, I may use Wikipedia for my own personal study, but definitely not when I need information to be presented in PBL class” (P3MS10)
Critically appraise medical evidence		“extremely important to critically analyse the evidence... because in the medical field the evidence is everywhere and it's critical for medical students and also health care professionals need to understand how to critically appraise the evidence in well-published studies...” (MA4)
Critical reading		“...reading is the main factor underlying the concept of critical thinking, because reading is not just for entertainment purposes. I believe that our role as

		teachers must motivate students to evaluate and analyse what they read. I always motivate my students not just to read but to understand what they read..." (MA2)
Extensive review of medical research results before presenting (new lens)		"I think that in the medical field the student or researcher before publishing the research results and applying it practically upon the patient needs to do more in depth review before the final phase of research. I think in this model, this stage comes before the final stage or be a part of it before publication or release of new research findings which contradict the existing findings of research conducted several years back. Therefore, I think that new research findings in the medical field need more in depth review before publication or even before practical or clinical application" (MA3)
Gathering information from reliable resources		"I have something to add here, which is that information must be obtained from reliable sources, which is something that students have to learn because many students regard Wikipedia, for example, as a reliable source of information, which it is not from a medical perspective. That is why any article to be drawn upon in any research paper must be obtained from reliable sources or extracted from peer-reviewed journals" (Lib1)
Evaluate: A medical student is able to review and evaluate the quality of medical information resources and critically appraise medical and clinical evidence.		

<p>The need to adopt appropriate information handling methods</p>		<p>“The way I do it is like this: if I find the topic too extensive, I try to condense all the information in one document, either making a note on the book itself, or otherwise making a separate note for future reference so that I can quickly get to it and refresh my memory. (P2MS10) “I mean that a student must establish his own database, regarding a particular disease such as lung cancer for example. So, a student or a researcher must gather all related information about this topic and then try to establish links between the different parts of gathered information for subsequent use in diagnostic processes” (Lib 6)</p>
<p>Managing information from different sources</p>		<p>“but we still faced considerable difficulties, because in the clinical phase we had numerous information resources like lectures, lecture notes, textbooks, research articles and other clinically important materials, which meant that we had the huge task of organising such information together to enable us to handle them easily” (P3MS1)</p>
<p>Efficient time management</p>	<p>It is the ability to adapt to schedule full of learning tasks and clinical activities including: attending classes, completing assignments and daily hospital rotations for clinical students.</p>	<p>“Time management is the most important thing. In the clinical phase is much more exhausting and time consuming than the pre-clinical phase as the students spend a lot of time working rotational shifts at the university hospital while at the same time attending theoretical lectures, so what they need most is to develop</p>

		<p>their time management skills" (P3MS6)</p> <p>“The third thing is to develop the skills of punctuality in terms of attendance and absence rates in addition to time management skills, since the situation during the clinical phase is different from that during the preclinical phase, as a medical student during the clinical phase has to attend on a daily basis unlike preclinical students who are allowed a certain leeway in terms of absence and that being the case, it is important for one to be able to strike a balance between daily activities and medical study” (P3MS12)</p>
<p>Manage: Medical students is able to organise a huge amount of medical information professionally and to manage their time efficiently.</p>		
<p>Synthesising information and creating new knowledge</p>	<p>The ability to compare, contrast and synthesise information coming from multiple resources in one written piece within the research context to create new knowledge as well as to improve medical practices.</p>	<p>“Also, I think another skill is to contrast and compare the different articles and to be able to extract the relevant information. This was, I think, the first exposure to writing research papers. So, we have difficulties in these aspects. I don't know if there is a way to develop this skill, but I think that we have to have such like courses or anything that may develop the skill of having efficient ways to collect information and compare them” (P3MS1)</p> <p>“not language barriers the information themselves [but] to find a way to be concise... not as a language but as a synthesising of information while writing” (P3MS1)</p>

		“possible use of this information [research findings] to improve medical practice and/or public health” (Student Guide for CMBS projects, 2016, p. 7)
Drawing connections among various medical information and ideas to draw conclusions	The ability to make links that enable medical students to understand complex medical concepts coming from numerous and various medical information sources. This skill involves synthesising information from different sources and recognising relationship between concepts with the aim of thinking in broad manner to draw conclusions, possibilities and develop the appropriate treatment plan.	<p>“Medical information fits very broad so I have a lot of medical information but if I do not know how to draw links between all kinds of medical information... I think it would be a problem. So it is the most important part that students should know how to have information literacy skills which are significant to students to relate all these information together” (MA9)</p> <p>“The whole idea of those PBLs is to get the students to think in a broad manner okay. So, we want them to think of all the options rather than reaching a specific diagnosis” (MA18)</p>
Synthesising information to create whether new knowledge or clinical conclusions		
Communicating effectively using appropriate writing styles	<p>This ability refers to the way in which medical students are able to communicate with others using the appropriate written texts. It is crucial element of academic life as it acts as a tool of sharing knowledge among particular audience.</p> <p>Based on the above definition, it has been found that this code does not capture the meaning of the quote. Therefore, it has been subsumed under “Communicating research findings and presenting data appropriately” code as it reflects and shares the same properties.</p>	“...how to arrange all the information and results obtained and finally how to present the results in professional way that captures the attention of all concerned in that particular research topic” (P3MS12)
Communicating research findings and	It refers to the ability that medical students need to present their research findings in	“For example, when I presented research results, I felt that graphs and diagrams

<p>presenting data appropriately</p>	<p>appropriate and understandable way to the readers.</p>	<p>needed no comment and were self-explanatory, which was one of the reasons for which I received a lot of criticism from the supervisor who said they are self-explanatory to you because you did the research and arrived at the conclusions which is not the case of the general public which need further explanation to simplify the presented material and make it easier to understand, but that was a hard skill to learn and we would not have been able to master on our own” (P3MS10)</p>
<p>Communication with patients</p>	<p>It is an ability medical students need to approach patients and communicate with them in empathy manner and how to listen actively to patients in order to elicit as much as accurate information through note-taking. This type of information helps medical students seek the most relevant information after identifying their information needs in order to reach the best diagnosis and then develop the appropriate treatment plan.</p>	<p>“I think that skills learned at the hospital in terms of... how to communicate with the patient, how to manage his/her case and how show sympathy to and gather information from the patient at one and the same time are far more important than the theoretical part itself because a future doctor must be skilled in communicating with patients who should be dealt with in a different way than with other people” (MA2)</p> <p>“I think that one of the most important skills that a medical student must learn is how to deal with the patient, how to take medical history note and how to diagnose the disease based upon symptoms” (MA8)</p> <p>“There is also a need for contextualising your approach to the patient. I mean medical students have to be information literate, but first and foremost they have</p>

		<p>to be aware of how to communicate with the patient, how to conduct the examination, how to take medical history and how to access relevant, disease-related information to remedy any information deficiency they may have and ensure making the correct medical diagnosis and providing the best service to their patients” (P3MS12)</p>
<p>Communication with clinical staff</p>	<p>This kind of communication is different from the above one. In this type medical students need to communicate with medical staff in various ways: verbal, nonverbal and written communication. For example, they collaborate with various healthcare professionals including nursing staff, pharmacists and social workers. In this type of collaboration, interpersonal skills like teamwork skills are highly required with the aim of improving healthcare services. Also, they present cases to medical staff taking place during everyday rounds. This presentation involves summarising patients’ history notes and other relevant examinations and diagnostic tests. This kind requires verbal, non-verbal (body language) and textual communication. Medical students need to communicate with senior medical staff with the purpose of using them as valuable information sources to seek advice on context-related health issues.</p>	<p>“...the doctors to nurses interaction, the doctor to technologist interaction, they're not superior, it's teamwork. They need to know that they're not the only ones there, that it has to be a teamwork with the nurses that acknowledge and the doctors aren't go there to treat the patient. It's not just a one man show...” (MA11)</p> <p>“Personally, the most important resource and the easiest to access is to ask your senior at the hospital, because you will always need to ask about things that are not to be found in the textbooks...for example, how things go during the hospital. They can sometimes be a very valuable source of information, because they can give you answers to many questions that you probably can't find in textbooks. I mean only a professor would be able to give you a valid answer if you ask whether a certain procedure is being done or a given protocol is applicable in Kuwait” (P3MS8)</p>

		<p>“...including how to present your case in clinical rounds, particularly how to move your hands and how to use body language. For me, such skills are much more important than the information being presented, because information is easily accessible” (P3MS3)</p>
<p>Communication with colleagues and peers</p>	<p>Medical students should be able to communicate with their colleagues and other academic staff whether during lectures or other group study sessions like PBL classes. This involves the ability to discuss, interact, actively listen, explain, effectively note take and verbally present information using the appropriate software.</p>	<p>“... I think they need to be able to communicate with each other, you know because it is also very important in the PBL environment. sometimes I notice the communication is very weak among them...basically communication skills are important...” (MA18)</p> <p>“In my opinion and pending the development of this PBL module, the students must learn to interact with each other and with the instructor, during classes, which is a very positive thing if it does take place” (MA9)</p> <p>“I feel that the best way is for them to ask course instructors, senior medical students or even relatives working in the medical field” (P1MS6)</p> <p>“I think that a second phase medical student needs to develop skills such as communication skills, which are necessary for a proper discussion of any problem, particularly in PBL classes, because without those skills, it would be difficult to successfully perform assignments” (P2MS1)</p>

		<p>“So, for example, when I manage to collect a substantial body of information about a certain topic, I find that discussing such collected information with a more knowledgeable person or even with professors is very helpful in arriving at a better understanding of this topic” (P2MS3)</p> <p>“Of course, a medical student must possess communication skills such as being a good listener, this is also important for being able to ask the right questions” (P2MS8)</p> <p>“Let us say that a medical student must possess skills like note taking, which enables a medical student to write down key points in the lectures administered by professors...that could serve as a working basis towards a more in-depth search for the information required for the completion of the assignment, which I think is the most important thing in PBL’s. In PBL class, we learned different things from different professors and even from one another. There was nothing specific, but it was helpful, nonetheless” (P2MS8)</p> <p>“Another key skill is presentation. To be totally honest, most of the students we have come across don’t know the first thing about PowerPoint presentation and only write down the information they read on a piece of paper and sit down</p>
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		and discuss it with us, but I prefer PowerPoint presentation, because information and ideas are up there in front of people so that they don't get confused" (P3MS11)
<p>Communication skills The ability to communicate verbally and non-verbally with students, academics, patients and other healthcare professionals as well as to present and communicate information and research findings to others. This genre of communication which is influenced by many affective factors like satisfaction is regarded as a literacy where IL is kind of it and thus according to Tuominen (2005) cited in (Whitworth, 2020, p.12) describes it as the ability "to enact in practice the rules of argumentation and reasoning that an affinity group in a specific knowledge domain considers good or eloquent".</p>		
Team work skills	It can be defined as the ability that enables medical students to work effectively with each other towards achieving specific goal. It was identified as essential element to collaborate successfully particularly during PBL environment.	<p>"The primary emphasis is upon work as part of a group or teamwork, so that every student allows the other the opportunity to speak. This concept is further developed in each session by dividing each work group into a moderator and a number of scribes, where the former determines the topic of research and the latter looks for textbooks that could be relevant to the research topic in order to arrive at the most significant points to be researched" (P2MS2)</p> <p>"The thing that we need the most is to master the team work skills in order to able to work as a group smoothly and effectively without undue complications" (P3MS10)</p> <p>"...how to work as a team, and how to distribute tasks among us, but mostly focusing on communication skills among researchers and how to work within a team" (P3MS9)</p>
Leadership skills	It refers to the ability that enable medical students to guide and	"Then there are other skills that must be possessed by the

	influence a group of medical students towards accomplishing specific goals.	<p>medical student, such as the ability to moderate discussions. For example, during PBL classes, students take turns playing the part of moderator, but if the student lacks leadership skill, successfully playing such a part could prove difficult” (P2MS3)</p> <p>“... but what we need most is a leader who possesses team management skills and can both manage and motivate the team to determine for example why a certain diagnosis is more likely than another and if one diagnosis is considered to be the most likely what is the most appropriate treatment” (P3MS12)</p>
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Interpersonal skills

According to Klein et. al. (2006) cited in (Bedwell, Fiore & Salas, 2014, p.173) interpersonal skills is defined as an “umbrella term that refers to goal-directed behaviours, including communication and relationship-building competencies, employed in interpersonal interaction episodes characterized by complex perceptual and cognitive processes, dynamic verbal and nonverbal interaction exchanges, diverse roles, motivations and expectancies”. This means that “communication skills” code is one aspect of “interpersonal skills” code and thus it has been grouped under interpersonal skills.

The headline “Present” in the SCONUL model would imply transmissive approach to teaching in educational context. This approach is in line with a teacher-focused approach phenomenographically identified by Trigwell, Prosser and Taylor (1994). By adopting such approach, the teacher delivers information by means of one-way communication methods including: lectures and presentations and thus could undermine the notion of instructive learning and encourage more passive learning approach that could leads to surface learning (Trigwell, Prosser & Waterhouse, 1999). For the purpose of this study, “present” pillar has been changed into “communication skills” to reflect the more two-way interactions and participations.

Another critique made by Socker and Coonan (2011) that SCONUL seven pillar model has reduced a wide range of higher-order cognitive and thinking skills in one pillar. Aspects such as synthesising, knowledge creation, summarising and attributing are all subsumed into “Present” pillar while skills comprising: identifying, scoping and seeking for information are distributed onto four pillars. For this study, “Present” pillar has been broken down into more other pillars such as “synthesising medical information and clinical evidence”, “interpersonal skills” and “application and implementation skills” in order to accommodate a wide range of context-based higher-order information abilities.

<p>Medical evidence implementation & Practical application of information and knowledge</p>	<p>It is the ability of applying or implementing medical information to clinical or research work. It is obvious from the quotation that “Present” pillar cannot accommodate or express skills or abilities that are required beyond the academic context. Therefore, this skill has been coded under “Application” category to reflect its properties.</p>	<p>“present skills could be replaced by implement because I assume that present skills are more fitted with teaching and doing research environments. In a clinic setting, it becomes implementation of the knowledge and evidence I apply to the patient. therefore, it may become implement rather than present” (MA4)</p>
<p>Application skills The ability to apply medical information to the clinical cases or research work.</p>		

Appendix (10): Ethical approvals given by The University of Sheffield and The Faculty of Medicine at Kuwait University

Appendix (10 A): Ethical approval given by The University of Sheffield



Downloaded: 15/06/2021

Approved: 21/04/2021

Fahad ALenezi
Registration number: 190300854
Information School
Programme: PhD LIBRARIANSHIP

Dear Fahad

PROJECT TITLE: Information literacy conceptions among medical undergraduate students: A case study of the Faculty of Medicine, Kuwait University.

APPLICATION: Reference Number 038044

On behalf of the University ethics reviewers who reviewed your project, I am pleased to inform you that on 21/04/2021 the above-named project was **approved** on ethics grounds, on the basis that you will adhere to the following documentation that you submitted for ethics review:

- University research ethics application form 038044 (form submission date: 07/04/2021); (expected project end date: 31/05/2023).
- Participant information sheet 1089510 version 1 (31/03/2021).
- Participant information sheet 1089509 version 1 (31/03/2021).
- Participant information sheet 1089508 version 1 (31/03/2021).
- Participant information sheet 1086630 version 3 (07/04/2021).
- Participant consent form 1089507 version 1 (31/03/2021).
- Participant consent form 1086626 version 2 (07/04/2021).

If during the course of the project you need to [deviate significantly from the above-approved documentation](#) please inform me since written approval will be required.

Your responsibilities in delivering this research project are set out at the end of this letter.

Yours sincerely

Paul Reilly
Ethics Administrator
Information School

Please note the following responsibilities of the researcher in delivering the research project:

- The project must abide by the University's Research Ethics Policy:
<https://www.sheffield.ac.uk/rs/ethicsandintegrity/ethicspolicy/approval-procedure>
- The project must abide by the University's Good Research & Innovation Practices Policy:
https://www.sheffield.ac.uk/polopoly_fs/1.671066!/file/GRIPPolicy.pdf
- The researcher must inform their supervisor (in the case of a student) or Ethics Administrator (in the case of a member of staff) of any significant changes to the project or the approved documentation.
- The researcher must comply with the requirements of the law and relevant guidelines relating to security and confidentiality of personal data.
- The researcher is responsible for effectively managing the data collected both during and after the end of the project in line with best practice, and any relevant legislative, regulatory or contractual requirements.



State of Kuwait
Ministry of Health
Asst. Undersecretary
for Planning & Quality

دولة الكويت
وزارة الصحة
وكيل الوزارة المساعد لشئون
التخطيط والجودة



المرجع: ٣١٨٤

التاريخ: ٢٠٢١/٦/٢٥

المحترم

السيد الفاضل / د. وكيل الوزارة

تحية طيبة وبعد

الموضوع: تسهيل مهمة الطالب / فهد العنزي -

طالب دكتوراه - University of Sheffield - كلية المعلومات / لإجراء البحث

تحت إشراف / Ms.Sheila Webber - Dr.Sophie Rutter

بالإشارة للإفادة الواردة من الأستاذ الدكتور/ عميد كلية الطب - جامعة الكويت بأن اللجنة الفرعية المفوضة من اللجنة الدائمة لتنسيق البحوث الطبية والصحية المشكلة بموجب القرار الوزاري رقم 2012/207 والقرارات المكملة له قد أوصت باجتماعها المنعقد بمركز العلوم الطبية بجامعة الكويت يوم الاربعاء الموافق 2021 / 6/ 16 بالموافقة على إجراء البحث المقدم الطالب / فهد العنزي - طالب دكتوراه - University of Sheffield - كلية المعلومات تحت إشراف / Ms.Sheila Webber - Dr.Sophie Rutter / تحت عنوان:

" مفاهيم ثقافة المعلومات لدى طلبة كلية الطب : دراسة حالة كلية الطب في جامعة الكويت "

Information literacy conceptions among medical undergraduate students:
A case study of the faculty of Medicine, Kuwait University

ويتم البحث باستخدام استبيان وإجراء مقابلات ومناقشات ضمن إطار مجموعات بحثية من المستهدفين بالدراسة بكلية الطب / جامعة الكويت حسب بروتوكول البحث.

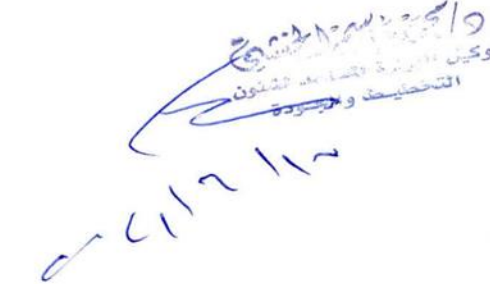
المرجع : ٣١٨٤

التاريخ : ٢٠٠١٦/٢

ولا يتضمن البحث أي تجارب طبية أو استخدام أدوية أو أخذ عينات حيوية.
لذلك يرجى الموافقة على توصية اللجنة الفرعية ونأمل مخاطبة الجهات ذات
العلاقة بموضوع البحث (السيدة/ أ. د. عميد كلية الطب - جامعة الكويت)
لعمل على تسهيل مهمة الباحث لإجراء البحث حسب الضوابط المنظمة لذلك.
مع مراعاة التزام الباحث بالمحافظة على حقوق المشاركين بالبحث بالخصوصية
وسرية المعلومات وعدم تداولها خارج إطار البحث والحصول على الإقرار المستنير
Informed Consent من المشاركين بالدراسة والتنسيق مع مدراء الإدارات ورؤساء
الأقسام التي ستجري بها الدراسة وفقا للضوابط المنظمة لذلك

وتفضلوا بقبول فائق الاحترام،،،،،

الدكتور / محمد جاسم الخشتي
الوكيل المساعد لشؤون التخطيط والجودة
رئيس اللجنة الدائمة لتنسيق البحوث الطبية والصحية



Hassan

يعتمد،،

حسب النظم
وكيل وزارة الصحة





State of Kuwait
Ministry of Health
Asst. Undersecretary
for Planning & Quality

دولة الكويت
وزارة الصحة
وكيل الوزارة المساعد لشؤون
التخطيط والجودة



المرجع : 3296

التاريخ : 21-6-2021

To Whom it May Concern

From: Ministry of Health – Kuwait

The Standing Committee for Coordination of Medical Research

*To: Fahad Alenezi
UNIVERSITY OF SHEFFUELD*

**Information literacy conceptions among medical undergraduate students:
A case study of the faculty of Medicine, Kuwait University**

*The above mentioned Proposal was given an ethical approval
by the Committee on JUNE 16, 2021.*

*The research will be conducted in Kuwait Faculty of Medicine,
Kuwait University.*

***Asst. Undersecretary for
Planning & Quality***

Head, Standing Committee for Coordination of Medical Research

Ministry of Health – State Of Kuwait


Dr. Mohammad Jasssem Al-Khashti
Asst. Undersecretary for Private
Medical Services Affairs

P.O. Box : (5) 13001 Safat, State Of Kuwait
Tel.: 24622230/24622228 - Fax : 24866514

ص. ب. (5) الرمز البريدي 13001 الصفاة، الكويت
تلفون: ٢٤٦٢٢٢٢٨ / ٢٤٦٢٢٢٣٠ - فاكس : ٢٤٨٦٦٥١٤

المرجع : ٣١٨٤

التاريخ : ٢٠٢١/٦/٢٠

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السيد الفاضل / د. وكيل الوزارة

تحية طيبة وبعد

الموضوع: تسهيل مهمة الطالب / فهد العنزي -

طالب دكتوراه - University of Sheffield - كلية المعلومات / لإجراء البحث
تحت إشراف / Ms.Sheila Webber - Dr.Sophie Rutter

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" مفاهيم ثقافة المعلومات لدى طلبة كلية الطب : دراسة حالة كلية الطب في جامعة الكويت "

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ويتم البحث باستخدام استبيان وإجراء مقابلات ومناقشات ضمن إطار مجموعات بحثية من المستهدفين بالدراسة بكلية الطب / جامعة الكويت حسب بروتوكول البحث.

Appendix (10 C): Research ethics proposal form submitted for The University of Sheffield



Application 038044

Section A: Applicant details	
Date application started:	Thu 21 January 2021 at 18:05
First name:	Fahad
Last name:	ALenezi
Email:	fsalenezi2@sheffield.ac.uk
Programme name:	PhD LIBRARIANSHIP
Module name:	Thesis Module
Last updated:	21/04/2021
Department:	Information School
Applying as:	Postgraduate research
Research project title:	Information literacy conceptions among medical undergraduate students: A case study of the Faculty of Medicine, Kuwait University.
Has your research project undergone academic review, in accordance with the appropriate process?	Yes
Similar applications:	- not entered -

Section B: Basic information	
Supervisor	
Name	Email
Sheila Webber	s.webber@sheffield.ac.uk
Proposed project duration	
Start date (of data collection):	Thu 1 April 2021
Anticipated end date (of project)	Wed 31 May 2023
3: Project code (where applicable)	
Project externally funded?	

No

Project code
- not entered -

Suitability

Takes place outside UK?
Yes

Involves NHS?
No

Health and/or social care human-interventional study?
No

ESRC funded?
No

Likely to lead to publication in a peer-reviewed journal?
Yes

Led by another UK institution?
No

Involves human tissue?
No

Clinical trial or a medical device study?
No

Involves social care services provided by a local authority?
No

Is social care research requiring review via the University Research Ethics Procedure?
No

Involves adults who lack the capacity to consent?
No

Involves research on groups that are on the Home Office list of 'Proscribed terrorist groups or organisations'?
No

Indicators of risk

Involves potentially vulnerable participants?
No

Involves potentially highly sensitive topics?
No

Section C: Summary of research

1. Aims & Objectives

Reviewed literature indicates that the Information Literacy (IL) movement is still in its early stages within the higher education institutions of the Arabic region and the GCC, and such institutions in the GCC have yet developed their own Information Literacy (IL) models and frameworks (Russel & Houlihan, 2017). Therefore, the aim of this study is to develop a model of IL for Kuwaiti medical students. These objectives are listed in the following section.

Research objectives

- 1- Investigate the current state of IL education practices in the Faculty of Medicine at KU.
- 2- Discover the perceptions of IL held by medical students, academics and librarians at KU.
- 3- Identify the factors which have an impact on the effective deployment and implementation of strategic IL programmes in the Faculty of Medicine at KU.
- 4- Develop an IL model in the context of the medical faculty at KU.
- 5- Develop recommendations for an effective information literacy programme in the Faculty of Medicine at KU.

In light to the aforementioned objectives, this research will attempt to address the following questions:

- 1- What are the medical students IL requirements at KU?
- 2- How do medical educators, students, and librarians of the medical faculty conceptualise IL within the academic context of KU?
- 3- What is the IL provision by the medical faculty and its educational context at KU?
- 4- What are the factors that influence the successful implementation of IL programmes?

Note: As this research takes place outside of the UK and will be conducted at Kuwait University; therefore requesting for an ethical approval from a relevant body in Kuwait is required, please note that Kuwait University (The Faculty of Medicine) is the eligible entity in Kuwait which is responsible for evaluating and granting the ethical approval for the inquirer of this research. In this regard, the researcher will apply for the ethical approval from Kuwait University after obtaining the ethical approval from the University of Sheffield.

2. Methodology

A qualitative single exploratory case study design will be employed in this research. This study falls into the category of a holistic single case study within embedded subunit of analysis because it focuses on a single case (The Faculty of Medicine) within the context of Kuwait University and then investigates the three different studying phases of medical undergraduate students as embedded units of analysis with the aim of understanding the phenomenon of Information literacy (IL) in its real-life context in order to develop IL model. Inductive approach can be seen as the most appropriate way to fulfil the aim of this study which is associated with developing IL model for Kuwaiti medical students.

The data will be collected from multiple resources by using a wide range of data collection methods:

1- semi-structured interviews:

This method will be used to gather data from medical undergraduate students in the three different phases which represent the Unit of analysis, and also from medical tutors who deliver Problem-Based Learning (PBL) sessions and those are affiliated with the Community Medicine Department (CMD) and delivering "Introduction to Computers in Medicine".

2- focus group discussion:

This method will be used to collect data from the librarians who are working in the Training and Information Literacy Department (TILD) which is a part of 20 departments of Health Science Centre Library (HSCL) at Kuwait University. Both the interviews and focus group discussion will be conducted in Arabic language.

3- document reviews:

Both public documents available on the official websites of KU and private sources such as IL instruction activities records, minutes of meetings and annual reports issued by TILD and CMD will be gathered and accessed. Another useful document relating to IL teaching strategies (class handouts, faculty teaching materials, course syllabus) and IL assessment strategies (assignment worksheets, faculty-developed rubric) will be gathered as well.

Regardless of the interview method, all interviews will be audio-recorded after the necessary permissions have been elicited from the participants. Interviews are meant to be primarily face-to-face unless circumstances and changes that would be caused by the COVID-19 pandemic, they will be moved completely online for more safety and live protection. However, Kuwaiti government represented by The Ministry of Health has commenced a rollout of vaccination plan since the beginning of January 2021 and it is expected that schools, colleges and university will be back to the normal situation over the next three months.

All the populations of this study will be interviewed face-to-face in a room at the Faculty of Medicine's Library (HSCL) at Kuwait University. The conversations will be audio recorded after obtaining the participants' permission; but if that is not possible because of pandemic restrictions, the interviews will be moved to be conducted in a virtual mode using Google meet application and they will audio recorded. If it is possible after gaining the permission from the participants, interviews will be audio and video recorded.

Further details about data collection procedures:

1- medical undergraduates students:

they will be divided into male and female participant. Due to cultural and religious concerns, the researcher will avoid meeting them in a closed room (face-to-face interview) and in case of online meeting, he must ensure that the interviews will be being recorded after making sure that the camera is switched off.

2- Medical tutors:

Due to the nature of their busy schedule, the researcher might sometimes needs to move to their own office in at the building of the Faculty of Medicine.

3- Medical librarians:

They will be interviewed in a room at the library of the Faculty of Medicine at Kuwait University but it will be larger than that of semi-structured interviews' one taking into count the size of group discussion sample and Covid-19 measures. Cultural and religious concerns will be applied to online meeting in case there is female participants.

Data analysis:

Collected data will be analysed thematically making full use of Nvivo software to assist the researcher in this process and in order to elicit the main themes, patterns and categories after coding the raw data. This process will help the researcher develop the appropriate model.

3. Personal Safety

Have you completed your departmental risk assessment procedures, if appropriate?

Yes

Raises personal safety issues?

No

This research is classified as a low-risk project and as mentioned earlier in the methodological section, participants in the present study are from the Community of Medical Faculty; they pose no physical or emotional risk neither to the researcher nor to the institution under which the present research is carried out. Again, the subject matter is not sensitive, upsetting, or traumatic; it focuses on IL practices in The Faculty of Medicine at Kuwait University.

Section D: About the participants

1. Potential Participants

Interviewees for this study are the Community of Medical Faculty at Kuwait University. The data will be collected from multiple participants: medical lecturers, undergraduate students and librarians who are closely related to IL teaching and learning practices in the selected case study. The following inclusion criteria are applied for the recruitment of participants:

1- medical undergraduate students will be recruited as a unit of analysis to understand the perception of the IL phenomena during their various studying phases. They will be selected purposefully from three different studying phases with the aim of obtaining a deep understanding of the IL phenomena because the understanding of learners' insider perspectives is a key player in learning (Todeva & Cenoz, 2009) and knowing students' opinions and views contributes to IL program development in order to provide them with a more comprehensive education (Yevelson-Shorsher & Bronstein, 2018). Based on these units, a sub-set of 36 undergraduate students will be selected purposefully from three studying phases with the aim of obtaining a deep understanding of the IL phenomena through conducting semi-structured interviews.

2- Librarians will be recruited from the Training and Information Literacy Department (TILD) which is a part of 20 departments of Health Science Centre Library (HSCL) at Kuwait University. This choice refers to the reason that TILD is responsible for promoting IL concepts and skills among staff, students and healthcare professionals of the medical faculty. Due to the high relevance of TILD for the purposes of this study, librarians are regarded as a major source of evidence and play a significant role in IL education. Given the common interest shared by this professional group, the researcher has decided to undertake a focus group discussion with 8 participants from TILD who share similar characteristics and attributes.

3- The recruitment of medical academics are a key component of the study of populations due to their leadership role in designing the IL curriculum and making policy decisions. Therefore, 12 academics from the Community Medicine Department (CMD) - it is responsible for delivering IL teaching interventions- will be recruited to conduct semi-structured interviews in order to produce an up-to-date review of the current state of IL and to identify the factors which have the most significant impact on the effective implementation of strategic IL programmes in the Faculty of Medicine at Kuwait University.

Another 10 academics will be recruited from the medical faculty departments who are engaged in teaching Problem-Based Learning (PBL) class for each unit of analysis to elicit their perceptions of what IL skills they expect that medical undergraduate students need within the environment of PBL and other teaching strategies.

The total number of participants of this study is 66, which aligns with the most similar PhD qualitative case study, e.g. Dokphrom (2010) recruited 68 respondents in Thailand, while Al-motawah (2016) employed 48 participants in Kuwait. In addition, both of them conducted a PhD in the Information School Program at The University of Sheffield. Once the participants have agreed to take part in this study, the interviews will be conducted in Health Science Centre Library (HSCL) at Kuwait University after obtaining consent from the library or they will be asked to choose a time, place and medium for the interview that is most convenient for them.

2. Recruiting Potential Participants

The participants of this study will be recruited in two ways: a written post illustrating the aims and objectives of the research under consideration will be distributed in the library and an e-mail having the same content of the post will be sent as an invitation to the all targeted population by the Faculty of Medicine' management after gaining the ethical approval form Kuwait university. Since the researcher is granted a scholarship from HE institution (the Public Authority

for Applied Education and Training PAAET) in Kuwait, he is eligible for and have full access to potential participants who meet the eligibility and criteria through personal and professional connections. Gaining an ethical permission from the University of Sheffield and the Faculty of Medicine at Kuwait University will enable the researcher to access all the study's sites, documents, participants and other relevant facilities related to the study under investigation. All the participants of this research will be recruited voluntarily and they will be sent an email with pre-interview information, which will include the following details:

- Background information about the researcher (including the university's name and course attended), and the reasons for conducting the research.
- A brief summary of the research aims, objectives and expected outcomes.
- A copy of the ethical approval from both the university of Sheffield and relevant body in Kuwait.
- A copy of information sheet
- A copy of the consent form.
- A clear statement about the participants' rights, including confidentiality and anonymity of information.

Due to current situation of Covid-19, alternative plan of recruiting participants can be placed face-to-face interviewing schedule. In this case, interviews will be completely moved online by sending an invitation email to the participants. Those who show desire in taking part in the study, information sheet and consent form will be sent to them in order to be signed and scanned and then sent back to the researcher. Another follow-up email will be sent to them including interview details such as time, period of meeting and a link of any suitable platform such as Google meet application. Regarding focus group, an invitation will be sent to those particularly who are working at the CMD in the Faculty of Medicine's library. This should include the aims and objectives of this research and the benefits behind this study showing that their participations should be completely voluntary without any obligations. After obtaining the acceptance of participation, the time and place of interviewing should be determined taking into account the space of room which must be larger than that of face-to-face semi-structured interviews in order to accommodate the large number of focus group participants bearing in mind the health measures. However, in case that face-to-face focus group cannot be held due to the Covid-19 situation the procedures of the virtual backup plan mentioned above will be applied.

2.1. Advertising methods

Will the study be advertised using the volunteer lists for staff or students maintained by CiCS? No

- not entered -

3. Consent

Will informed consent be obtained from the participants? (i.e. the proposed process) Yes

For the purpose of obtaining consent for this study, the researcher has prepared informed consent and produced three information sheets for each group (medical students, librarians, medical academics) attached in this application. These documentations should provide prospective subjects who will be recruited for one-to-one interview and focus groups with detailed information about the purpose of the study, procedures, data protection, voluntary participation, and any potential risks or benefits that may arise as a result of their participation. They can also be given the subjects information on ways to withdraw from the study, along with information on when it may no longer be possible for their data to be removed (for example, after publication). Prior to the interview, both informed consent form and information sheet will be emailed to potential participants in order to obtain their initial consent. Then, the participant will be given plenty of time to study the information sheet and to ask questions as needed. If the participant agrees to take part of this study, he/or she will be asked to sign the consent form, while both the researcher and the participant will retain a copy of it. If the interview is conducted in a face-to-face format, then the original signed consent will be retained by the researcher. For those who will be interviewed virtually (e.g. via Google meet application), the participant will be requested to sign, scan, and then email the signed form digitally to the researcher. In addition, the participant will be assured that even after signing the consent form, it is still possible to withdraw from the project/ interview. This will be made very clear to the participant in both the information sheet and informed consent form.

Potential participants will be given time to read the information sheet and are free to give consent to be involved. Before deciding to take part, they will be told how they were identified and what expected benefits or harms associated with their participation in this study. In particular, participants will be asked to participate in one-to-one interview and focus groups.

4. Payment

Will financial/in kind payments be offered to participants? No

5. Potential Harm to Participants

What is the potential for physical and/or psychological harm/distress to the participants?

This study is not concerned with sensitive matters, which might embarrass or harm the research participants. However, there may be many issues could be raised in this study as follows:

1- Safety (the issues to do with people being in safe spaces, and being protected from COVID):

There may be a safety issue with a face-to-face meeting with strangers and health harm could also be resulted from conducting face-to-face interview or focus group during the current situation of Covid-19.

2- Confidentiality issues:

Personal information and respondents' privacy protection issues which especially can be produced in the situation of focus group discussion could also be raised in this research.

3- Issues concerning the privileged position of the researcher:

Issues related to the researcher's position and his permission gained from Kuwait University may cause kind of obligation or pressure on respondents' participation particularly during the stage of data collection.

How will this be managed to ensure appropriate protection and well-being of the participants?

These issues can be addressed through stipulating some steps to the participants and follow ethical procedures which are discussed and articulated in the next sections:

1- Safety

Interviews will be conducted in official spaces (e.g. the Faculty of Medicine's library) where both the researcher and participants can feel safe and comfortable or online, in which case the participants will be in a safe environment. Also, as mentioned previously, face-to-face interviews will be conducted on public safe place (e.g., The Faculty of Medicine' library) to ensure the safety and security of both the researcher and participants. Given the current COVID-19 pandemic, the researcher will follow the instructions and guidelines imposed by the government of Kuwait when conducting the interview in-person, and also will refer to the updated policy document published recently by Kuwait University in this regard. Regarding Covid-19 situation, interviews and focus group will be completely moved into virtual mode using (Google Meet Applicatio) with the aim of avoiding any harm could be caused to the participants.

2- Confidentiality issues:

Regarding focus group, the researcher will ensure that data collection procedures must prevent any inadvertent confidentiality breaches. For example, in focus groups agree clear ground rules about confidentiality at the start using first names only, agreeing that 'what is said in the room stays in the room; avoid unnecessarily intrusive questions; and remain sensitive to an individual's right not to provide information. Also it is good practice to anonymise individual data using anonymous identifiers. For instance, for qualitative data, such as interviews and focus groups, the researcher may need to replace names and locations with pseudonyms; and only start recording after people have introduced themselves. Furthermore, the participants will be informed that their data, and in particular their personal information will be protected and anonymised as per the General Data Protection Regulation (GDPR). To be sure, the procedures of data privacy and confidentiality will be clarified in written and verbally to the participant.

3- Issues concerning the privileged position of the researcher:

All research participants will be assured that the participation in this study is voluntary and free of coercion. However, they cannot withdraw from the study after commencing the data analysis phase (i.e., August 2021) without any negative consequences. Participants will be informed that their participation is completely voluntary and it will not be affected by the permission that the researcher possesses from their employer to conduct the research. Therefore, the researcher will make it clear that research participants are not obliged to share information they prefer to keep private and more generally that they can decline to take part or withdraw from the research at any point. Also in case a participant does become upset or distressed, the researcher will offer to pause the interview, or to terminate and/or rearrange it and he will remind them that their participation is voluntary and their decision about how to proceed will be guided by their preferences. To ensure that the participants has read and understood their rights and responsibilities, they will be asked to provide a signature in both the consent form and information sheet.

Section E: About the data

1. Data Processing

Will you be processing (i.e. collecting, recording, storing, or otherwise using) personal data as part of this project? (Personal data is any information relating to an identified or identifiable living person).

Yes

Which organisation(s) will act as Data Controller?

University of Sheffield only

2. Legal basis for processing of personal data

The University considers that for the vast majority of research, 'a task in the public interest' (6(1)(e)) will be the most appropriate legal basis. If, following discussion with the UREC, you wish to use an alternative legal basis, please provide details of the legal basis, and the reasons for applying it, below:

N/A

Will you be processing (i.e. collecting, recording, storing, or otherwise using) 'Special Category' personal data?

No

3. Data Confidentiality

What measures will be put in place to ensure confidentiality of personal data, where appropriate?

All research data including interview recordings, interview transcripts, documents and participant's personal data will be encrypted and stored at the Research Groups' dedicated space which is backed up regularly by IT team. This research storage is password protected using two factor user authentication that implemented recently by the IT team which add an extra level of data security. Personal data of the interviewee will be pseudonymised by storing personal details (e.g. name) separately and creating a key or code to enable re-identification. To be specific, the participant's name will be replaced immediately after the interview by assigning a random code/or number which make it difficult for the stranger to identify the true identity of participants. Likewise, no confidential data of participants will be disclosed in the thesis or any related publications. The researcher will also ensure that the participants are aware of this and that the thesis and related publications do not reveal any name, job title, or identifiable data that could lead to the identification of any participant. All research data, if agreed by the participants, will be archived in a safe repository provided by the university for the purpose of the submission of thesis.

Personal data in this research will be handled in accordance to the university's ethics policy and GDPR. Interview transcripts will be anonymized and assigned a random number. Participant's personal details will not be disclosed to any third party without obtaining a written approval from him or her. The transcription and analysis of interview data will be undertaken by the researcher himself in order to ensure high confidentiality of participant's data. Sensitive documents (if any) will be encrypted. During the writing up stage, the researcher will ensure that no identifiable personal information (e.g., name, job title, address) will be used when reporting the research findings. Likewise, the organization name of participant or any relevant information will also be anonymized. All research data will be deleted /archived as per the time frame specified on the next section.

Due to the fact that The Faculty of Medicine is the only medical institution in Kuwait, there are some fears and concerns associated with the possibly that participants' identities and names could be easily identifiable. To protect the interviewees from such risks, they will be promised confidentiality. Their personal identities will be anonymised and pseudonyms assigned prior to transcription. Identities and any distinguishing characteristics indicated in the interview will be omitted from the interview transcript to ensure that participants cannot be identified from the text. Likewise, customer identifiable information, if being accidentally disclosed by the interviewee, it will also be anonymised. In addition to that measures, the participants will be informed about their right to refuse to answer any sensitive questions that may increase their anxiety/ or distress during the interview. Also, they will be given the opportunity to terminate the interview at any point of time, and request the researcher to destroy their data permanently. Moreover, the interviewee will be protected through the signed informed consent form which will allow him/or her to raise any complaint about the research if he/or she feel that their data is compromised or made public without formally obtaining the necessary permissions.

4. Data Storage and Security

In general terms, who will have access to the data generated at each stage of the research, and in what form

In general, the researcher and his supervisors will have access to the research data at all stages of the research from the data collection to the archival/or deletion of research data. However, the researcher will be responsible to store/or move the relevant research data into the university drive and ensure that it is backed up on regular basis. Also, the researcher will be responsible to move the research data to the archive if required by the university and agreed by the participants.

What steps will be taken to ensure the security of data processed during the project, including any identifiable personal data, other than those already described earlier in this form?

Any backups and copies of participant data will be controlled and secured. In this research, the researcher will follow a 3-2-1 backup strategy (3 copies; 2 different storage media; 1 offsite). Throughout the project lifecycle, all research data and files will be backed up to two hard drives (HDDs) in addition to the master copy which will be stored at the Research Group's dedicated space mentioned above. Encrypted external hard drive with two-factor authentications will be synchronised on a weekly basis using Microsoft SyncToy 2.1 software. This drive will be kept and locked in a secure physical location at the information school. Another backup copy will be stored on the departmental laptop, and will be protected by password, and by installing anti-virus software in order to safeguard sensitive files from potential hacks. The third copy will be stored on the University's Google drive to ensure the availability of research data if in case the two highlighted backups are not functioning properly.

Will all identifiable personal data be destroyed once the project has ended?

Yes

Please outline when this will take place (this should take into account regulatory and funder requirements).

Data anonymization will take place immediately after the interview. Any personal information and completed consent forms will be confidentially destroyed after a year of being awarded the Ph.D. by the lead researcher. In addition, all research data, if agreed by the participants, will be archived in a safe repository provided by the university usually minimum for 10 years from the submission of thesis. However, where permission has been given by participants for this reuse, anonymized transcripts of the interviews will be shared with audiences and upcoming researchers through Sheffield ORDA and linking them to the final dissertation. All personal data, such as contact information and names will be removed before transferring the data to ORDA. The researcher will seek signed consents for that and transfer of participants' copyright. The datasets will be released publicly in ORDA when the thesis is made available through White Rose eTheses Online.

Section F: Supporting documentation

Information & Consent

Participant information sheets relevant to project?

Yes

Document 1089510 (Version 1) Information sheet (Medical Undergraduate Students)	All versions
Document 1089509 (Version 1) Information sheet (Medical Librarians)	All versions
Document 1089508 (Version 1) Information sheet (Medical Academics)	All versions
Document 1086630 (Version 3) participant Information sheet	All versions

Consent forms relevant to project?

Yes

Document 1089507 (Version 1) Informed consent	All versions
Document 1086626 (Version 2) Informed consent	All versions

Additional Documentation

External Documentation

Kuwait university's permission is being sought and that research will not proceed unless this is in place.

Section G: Declaration

Signed by:

Fahad Alenezi

Date signed:

Wed 7 April 2021 at 14:39

Official notes

- not entered -

Appendix (10 D): Research ethics proposal form submitted for The Faculty of Medicine



**Kuwait University Health Sciences Center
HSC Ethics Committee for Student Research
Forms for Submission of Student Research Proposals**



Group # 1	Summary Table The University of Sheffield-Information School, Student Project – 16/06/2021	
Project title	Information literacy conceptions among medical undergraduate students: A case study of the Faculty of Medicine, Kuwait University مفاهيم ثقافة المعلومات لدى طلبة كلية الطب: دراسة حالة كلية الطب في جامعة الكويت	
Tutor Name and Department	Tutor Name: First supervisor: Ms. Sheila Webber Second supervisor: Dr. Sophie Rutter	Department: Information School
Student Names	Student Names in English: Fahad ALenezi	Student Names in Arabic: فهد العنزي
Target Population	Target Population: The Community of the Faculty of Medicine at Kuwait University: <ul style="list-style-type: none"> • Medical Undergraduate Students • Faculty Members • library personnel within the HSC Age range of the target population: 18 years and above	
Sites of Data collection	List all the specific sites requested for data collection: The Faculty of Medicine at Kuwait University Laboratory site for blood or other analysis (if any): None	
Data Collection Procedures and Date Range	Semi-structured interviews <ul style="list-style-type: none"> • Medical Undergraduate Students • Faculty Members Focus group discussion <ul style="list-style-type: none"> • library personnel within the HSC 	Date range of Data Collection: Data collection will last for 3 months from the date of obtaining the approval
Medical Record Statement	No Ministry of Health medical records will be accessed for this research	
Committee Decision	Date: _____ <input type="checkbox"/> Approved as is <input type="checkbox"/> Approved, contingent on the following actions:	<input type="checkbox"/> On hold, awaiting the following actions: Address Committee letter to:

**Ministry of Health
The Standing Committee for
Coordination of Health and
Medical Research**



**وزارة الصحة
اللجنة الدائمة لتنسيق
البحوث الطبية والصحية**

لبيانات الرئيسية لمشروع بحث للعرض على اللجنة

السنة: 2021

رقم البحث :

تاريخ تقديم الطلب: 16/06/2021

الباحثون مشاركون: Students: Fahad Alenezi فهد العزي	الباحث الرئيسي: Faculty Supervisor: First supervisor: Ms. Sheila Webber s.webber@sheffield.ac.uk Second supervisor: Dr. Sophie Rutter s.rutter@sheffield.ac.uk
مدة مشروع البحث: مدة جمع البيانات ثلاثة اشهر ابتداء من 20-06-2021 الى تقريبا 30-10-2021 ملاحظة: عملية جمع البيانات سوف تتوقف خلال شهر اغسطس نظرا لظروف العطلة الصيفية.	المنطقة/المستشفى/القسم/الادارة انظر الى المرفق "ملخص خطة البحث"

عنوان البحث المقترح / Research Title : مفاهيم ثقافة المعلومات لدى طلبة كلية الطب: دراسة حالة كلية الطب في جامعة الكويت Information literacy conceptions among medical undergraduate students: A case study of the Faculty of Medicine, Kuwait University
--

اهداف البحث / Objectives : انظر الى المرفق "ملف الأخلاقيات" تحت عنوان "أهداف البحث". See "Study Objectives" in the attached Ethics Portfolio.
--


ملخص خطوات البحث / Research Plan / Protocol (1): انظر الى المرفق "ملخص خطة البحث". See the attached "Summary of Research Plan"

النتائج المتوقعة / Expected Outcome : انظر الى المرفق "ملف الأخلاقيات" تحت عنوان "الفوائد والنتائج المتوقعة". See "Expected Outcomes" in the attached Ethics Portfolio.
--

إقرار الموافقة على المشاركة بالبحث (يرجى إرفاق نسخة من الإقرار باللغة العربية والإنجليزية) (2) Informed Consent: انظر الى المرفق "إقرار الموافقة". See "Informed Consent Forms" in the attached Ethics Portfolio.
--

إجراءات حقوق المرضى لضمان سرية المعلومات والخصوصية: انظر الى المرفق "ملف الأخلاقيات" تحت عنوان "الخصوصية". See "Confidentiality" in the attached Ethics Portfolio.

الميزانية التقديرية : لا يوجد (None) جهة التمويل الخارجية : لا يوجد (None)
--

الموافقة على تقديم البحث		
مدير المستشفى / الإدارة :	رئيس القسم :	الب Sheila Webber 

ملاحظات:
 يتم استلام هذا النموذج من قسم البحوث بإدارة التخطيط والمتابعة، ويقوم الباحث المتقدم بعد استيفاء البيانات بالنموذج وإرفاق الوثائق المذكورة أعلاه بأرقام (1) ، (2) بتسليمهم للسيدة / رئيس قسم البحوث بإدارة التخطيط والمتابعة حيث سيرسل للجنة الدائمة والتي بواسطتها سيبلغ المتقدم برأي اللجنة لاحقا.
 هواتف قسم البحوث : مباشر 42836842 بدالة : 42888244 / 42888838 داخلي: 4828 / 4634 فاكس: 42836382 يكتب على الفاكس عبارة ((لعناية السيدة / رئيس قسم البحوث خاص بالبحث رقم))

This form is to be submitted to the HSC Ethics Committee for Student Research

Summary of Research Plan

Date: 16/06/2021

Faculty and Department:

The University of Sheffield – Information School

Investigator's names and designation:

Faculty supervisor: Ms. Sheila Webber
Dr. Sophie Rutter

The University of Sheffield – Information School Student:

Fahad ALenezi

Project Title: Information literacy conceptions among medical undergraduate students: A case study of the Faculty of Medicine, Kuwait University

Summary of the Study, Population, and Data Collection Procedures:

The understanding of the notion of information literacy (IL) has increasingly developed since the 1970s within the information environment. It has been seen as critical factor that addresses the complexity of the rapid production of information resources through a wide range of complicated platforms in the digital era. The concept of IL is widely used across all disciplines, including medicine and the health care professions. Over the past few decades, many changes have been introduced to medical education; largely dependent on a constructivist approach to learning (e.g., collaborative learning, problem solving approaches, research projects and clinical skills learning) (Yamine, 2013).

As a result, IL-related skills have currently been situated at the center of a medical school's mission, accompanied with accreditation processes that enhance critical thinking and lifelong learning skills; essential to such pedagogical approaches (Tagge, 2018). The uniqueness of health science education makes it distinctive from other disciplines because the use of suitable existing evidence for decision-making in health requires programs that produce highly skilled, information-literate, graduates (Smith, 2019).

It is believed that IL plays a key role in health sciences programs and affects teaching, learning and research practices (Ullah & Ameen, 2019). This is especially seen to be the case in the context of evidence-based medicine (EBM), in which clinical and medical practices are based on evidence and other research (Forster, 2015a). Therefore, developing IL models and frameworks are necessary for health sciences students in order to make them able to identify, gather, use, manage and synthesize information sources and other research evidence, with the ultimate aim of creating the new knowledge and wisdom that is required to develop and deliver the best health care practices within clinical contexts (Smith, 2019). Information Literacy (IL) plays a vital role in a wide range of contexts and sectors: economics, business, academic, everyday life and health and education. Medicine is considered to be one of these sectors.

The Medical Library Association (MLA) confirms that information about health is prevalent everywhere yet obtaining it can be difficult. Hence, IL empowers medical professionals and students to make a balanced judgement about any information they find and use.

IL movement is still in its early stages within the higher education institutions of the Arabic region and the GCC, and such institutions in the GCC have yet developed their own IL models and frameworks (Russel & Houlihan, 2017). Based on the surveyed literature, there is very little literature in relation to IL in the context of Arabic and GCC countries in general and in Kuwait in particular (Al-Issa, 2013; Alkhezzi & Henda, 2018; Leshner, 2002). There has been thus far no empirical study that investigates IL in the context of medicine at KU.

As mentioned above, IL can be understood in different ways depending on context and discipline. Therefore, this study proposes a single case study with embedded unit of analysis design as an attempt to fill this gap throughout an in-depth investigation of undergraduate medical students' perceptions with the aim of developing an appropriate IL model. It will also contribute to the existing knowledge by further enhancing IL conceptions in the region of Kuwait and GCC which will help understand the most significant aspects of IL in this context.

A qualitative single exploratory case study design will be employed in this research. This study falls into the category of a holistic single case study within embedded subunit of analysis because it focuses on a single case (The Faculty of Medicine) within the context of Kuwait University and then investigates the three different studying phases of medical undergraduate students as embedded units of analysis with the aim of understanding the phenomenon of Information literacy (IL) in its real-life context in order to develop IL model. Inductive approach can be seen as the most appropriate way to fulfil the aim of this study which is associated with developing IL model for Kuwaiti medical students. The data will be collected from multiple resources (medical academics-students-librarians) by using a wide range of data collection methods (semi-structure interviews-focus group discussion-document reviews).

Purposeful sampling is the most common approach used in qualitative research (Saunders et al., 2009). However, determining sample size in advance is a problematic and daunting task for qualitative researchers (Malterud, Siersma & Guassora 2016; Sim et al., 2018). Hence, several issues, such as the scope of the study, and the degree of homogeneity among participants, should be taken into consideration to make any justification of sample size determination (Boddy, 2016). For the purpose of this study, data will be collected from three major stakeholders: medical educators, librarians and undergraduate students. Therefore, multiple purposive sampling strategies will be utilized in order to determine a sample size. The total estimated sample size of this study ranges from 45 to 60 participants distributed on three different segments as follows:

Undergraduate students (36) based on the phases of their studying duration,
Faculty members (20),
library personnel within the HSC (8).

These targeted population includes all participants who are enrolled within The Faculty of Medicine at KU aged 18 years and above regardless of their gender and nationalities. All required data will be collected using semi-structure interviews (academics and students) and focus group discussion (library personal). The estimated length of these interviews will range from 45 to 60 minutes but focus group discussion may take two hours. The data will be gathered first from the academics and library personal and when finished it will be gathered from the students. Data collection stage will last for 3 months from the date of obtaining the approval taking into account the summer holiday and any other official holiday like Eid Adha leave.

عنوان البحث المقترح: مفاهيم ثقافة المعلومات لدى طلبة كلية الطب: دراسة حالة كلية الطب في جامعة الكويت

أسماء الأماكن المحددة التي سيتم جمع البيانات فيها:

كلية الطب في جامعة الكويت

Project Title: Information literacy conceptions among medical undergraduate students: A case study of the Faculty of Medicine, Kuwait University

Names of specific sites to be accessed for data collection:

The Faculty of Medicine, Kuwait University

Human Subjects Form

Title: Information literacy conceptions among medical undergraduate students: A case study of the Faculty of Medicine, Kuwait University.

Study Objectives:

- 1- Investigate the current state of IL education practices in the Faculty of Medicine at KU.
- 2- Discover the perceptions of IL held by medical students, academics and librarians at KU.
- 4- Identify the factors which have an impact on the effective deployment and implementation of strategic IL programs in the Faculty of Medicine at KU.
- 5- Develop an IL model in the context of the medical faculty at KU.
- 6- Develop recommendations for an effective information literacy program in the Faculty of Medicine at KU.

Human Subjects

Yes No Are human subjects to be enrolled?

If yes, from which population will they be identified?

- General population, adults (specify: _____)
- General population, minors (specify: _____)
- Patients, outpatient setting (specify: _____)
- Patients, inpatient setting (specify: _____)
- Other (specify: The Community of the Faculty of Medicine)

Estimated Sample size: 45 - 60

Methods

The methods of the study include the following:

- Questionnaire
- Screening/diagnostic procedures/tests (specify: _____)
- Physical examination (specify: _____)
- Other (specify: semi-structured interview & focus group)
-

Risks

Does the research pose any risk to participants in the following categories?

- | Yes | No | |
|--------------------------|-------------------------------------|---|
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | Risks to social or psychological well-being? (specify: _____) |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | Risks to physical well-being? (specify: _____) |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | Conflict with local religious or cultural beliefs? (specify: _____) |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | Risks over and above routine clinical care? (specify: _____) |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | Risks from invasive procedures? (specify: _____) |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | Other risks? (specify: _____) |

Benefits

List the benefits the participant and/or medical science will receive from this study

This study will contribute theoretically to IL in medical education as well as IL in the Arabic region.

The research aims to theoretically contribute to the IL field by enhancing our understanding of the role of IL models and frameworks as guidelines for teaching IL. The emergent findings from this study will fill gap in knowledge as this is a topic that has not been extensively explored in the literature.

More specifically, the concepts and themes that are inductively derived from the empirical data of this study constitute another significant contribution. They can be a helpful step and provide useful insights for those in the Arabic region and GCC countries to develop their own IL models and frameworks (Russel & Houlihan, 2017).

Practically, this study is going to add positive value to those who are working in the educational field and healthcare environment in the context of Kuwait and the Arabic region. At the local level, the present research could form the basis for designing a more effective IL curriculum, and a model that will be developed can be used as a guideline by medical librarians to review their IL teaching and learning practices. At the regional level, those in the GCC and the Arabic world can also take advantage of the dissemination of this study' results as a key insight for developing their own IL models or as IL teaching guidelines.

Yes No

In your opinion, do the benefits outweigh the risk?

Confidentiality

Yes No
 Is confidentiality assured in this study?

If so, how?

- Anonymous data collection (name or identifying information not obtained)
- Name taken, but stored in a separate database from other study databases, which identify participants using ID numbers only.
- Study forms with identifiers are accessible to study personnel only, and are stored in locked cabinets.
- Other precautions (specify: _____)

Informed Consent

- Yes No
 The Informed Consent form is prepared in English and Arabic
- Is it clearly stated that participation is voluntary, that no negative consequences will result if the prospective participant does not choose to participate, and that the participant may withdraw from the study at any time without any negative consequences?
-

Appendix (11): Consent forms and Information sheets

Appendix (11 A): Consent form in English version issued by The University of Sheffield



Participant Consent Form

It should be considered in conjunction with the accompanying information sheet

Information literacy conceptions among medical undergraduate students: a case study of the Faculty of Medicine, Kuwait University (University of Sheffield, PhD Librarianship, Thesis module)

<i>Please tick the appropriate boxes</i>	Yes	No
Taking Part in the Project		
I have read and understood the project information sheet and agreed that the project had been fully explained to me. (If you will answer No to this question, please do not proceed with this consent form until you are fully aware of what your participation in the project will mean.)	<input type="checkbox"/>	<input type="checkbox"/>
I have been given the opportunity to ask questions about the project.	<input type="checkbox"/>	<input type="checkbox"/>
I agree to take part in the project. I understand that taking part in the project will be interviewed AND recorded (audio or video as agreed upon before the interview).	<input type="checkbox"/>	<input type="checkbox"/>
I understand that my taking part is voluntary and that I can withdraw from the study at any time/before the data has been anonymised, analysed or published on 10/2021. I do not have to give any reasons for why I no longer want to take part, and there will be no adverse consequences if I choose to withdraw.	<input type="checkbox"/>	<input type="checkbox"/>
How my information will be used during and after the project		
I understand my personal details such as name, phone number, address and email address etc. will not be revealed to people outside the project.	<input type="checkbox"/>	<input type="checkbox"/>
I understand and agree that my words may be quoted in publications, reports, web pages, and other research outputs. I understand that I will not be named in these outputs unless I specifically request or agreed on this.	<input type="checkbox"/>	<input type="checkbox"/>
I understand and agree that other authorised researchers will have access to this data only if they agree to preserve the confidentiality of the information as requested in this form.	<input type="checkbox"/>	<input type="checkbox"/>
I understand and agree that other authorised researchers may use my data in publications, reports, web pages, and other research outputs, only if they agree to preserve the confidentiality of the information as requested in this form.	<input type="checkbox"/>	<input type="checkbox"/>
I give permission for the anonymised transcript of the interview/focus group [delete the option that does not apply] in which I participated to be deposited with Sheffield ORDA (the University of Sheffield's research data depository) and linked to Fahad Alenezi's thesis so it can be used for future research and learning.	<input type="checkbox"/>	<input type="checkbox"/>
So that the information you provide can be used legally by the researchers		
I agree to assign the copyright I hold in any materials generated as part of this project to The University of Sheffield.	<input type="checkbox"/>	<input type="checkbox"/>

Name of participant [printed]

Signature

Date

Name of Researcher [Fahad Alenezi]

Signature

Date

Project contact details for further information:

lead researcher:

Fahad Alenezi
fsalenezi2@sheffield.ac.uk

Supervisors:

Ms. Sheila Webber
s.webber@sheffield.ac.uk
 Dr. Sophie Rutter
s.rutter@sheffield.ac.uk

The template of this consent form has been approved by the University of Sheffield Research Ethics Committee and is available to view here: <https://www.sheffield.ac.uk/rs/ethicsandintegrity/ethicspolicy/further-guidance/homepage>



Participant Consent Form

If you have any difficulties with, or wish to voice concern about, any aspect of your participation in this study, please contact Dr Paul Reilly, Research Ethics Coordinator, Information School, The University of Sheffield (ischool_ethics@sheffield.ac.uk).

Appendix (11 B): Consent form in Arabic version issued by The University of Sheffield



استمارة موافقة مشارك

اسم الباحث: فهد العنزي

اسم المشروع : مفاهيم ثقافة المعلومات لدى طلبة كلية الطب: دراسة حالة كلية الطب في جامعة الكويت

لا	نعم	يرجى اختيار الاجابة المناسبة
		المشاركة في المشروع
<input type="checkbox"/>	<input type="checkbox"/>	أتعهد باطلاعي على ورقة معلومات المشروع وأقر بأنه قد تم شرح المشروع بالكامل. (في حال الاجابة بـ" لا" على هذا السؤال ، يرجى عدم اكمال نموذج الموافقة حتى تكون على دراية كاملة بما تعنيه مشاركتك في المشروع).
<input type="checkbox"/>	<input type="checkbox"/>	لقد سنحت لي الفرصة بطرح اسئلة متعلقة بالمشروع.
<input type="checkbox"/>	<input type="checkbox"/>	أقر بأن مشاركتي اختيارية وأنه يمكنني الانسحاب من الدراسة في أي وقت / قبل 10-2021 ؛ ولست مضطرة لإبداء أي أسباب في عدم رغبتني في المشاركة مع عدم وجود نتائج سلبية ، في حال الانسحاب.
<input type="checkbox"/>	<input type="checkbox"/>	أقر بأن مشاركتي اختيارية وأنه يمكنني الانسحاب من الدراسة في أي وقت / قبل إخفاء بياناتي أو تحليلها أو نشرها. ولست مضطرة لإبداء أي أسباب في عدم رغبتني في المشاركة مع عدم وجود نتائج سلبية ، في حال الانسحاب.
		كيفية استخدام معلوماتي أثناء وبعد المشروع
<input type="checkbox"/>	<input type="checkbox"/>	أقر بأن بياناتي الشخصية مثل الاسم ورقم الهاتف والعنوان وعنوان البريد الإلكتروني وغير ذلك من البيانات لن يتم الإفصاح عنها لأشخاص خارج المشروع.
<input type="checkbox"/>	<input type="checkbox"/>	أقر وأتعد بإمكانية اقتباس كلمتي في المنشورات والتقارير وصفحات الويب ومخرجات البحث الأخرى. أقر أنه لن يتم ذكر اسمي في هذه المخرجات ما لم أطلب ذلك بالتحديد أو أوافق عليه.
<input type="checkbox"/>	<input type="checkbox"/>	أقر بأن الباحثين المعتمدين الآخرين لن يتمكنوا من الوصول إلى هذه البيانات إلا إذا تعهدوا بالمحافظة على سرية المعلومات كما هو مطلوب في هذا النموذج.
<input type="checkbox"/>	<input type="checkbox"/>	أقر بأنه يجوز للباحثين المعتمدين الآخرين استخدام بياناتي في المنشورات والتقارير وصفحات الويب ومخرجات البحث الأخرى ، مع الإقرار بالمحافظة على سرية المعلومات كما هو مطلوب في هذا النموذج.
<input type="checkbox"/>	<input type="checkbox"/>	أمنح الإذن ببيانات المقابلة ونص المقابلة الذي قدمته لإيداعه في مؤسسة شيفلد وربطه بأطروحة فهد العنزي حتى يمكن استخدامه للبحث والتعلم في المستقبل.
		بحيث يتمكن الباحثين من استخدام المعلومات التي تقدمها بشكل قانوني.
<input type="checkbox"/>	<input type="checkbox"/>	أقر وأتعد بالتنازل عن حقوق النشر التي أمتلكها في أي مواد تم اعدادها كجزء من هذا المشروع إلى جامعة شيفلد.

اسم المشارك: التوقيع:

اسم الباحث: فهد العنزي : التوقيع: التاريخ:

تفاصيل التواصل بخصوص المشروع لمزيد من المعلومات:
المشرفين:

Project contact details for further information:

lead researcher:
Fahad Alenezi
fsalenezi2@sheffield.ac.uk
Supervisors:
Ms. Sheila Webber
s.webber@sheffield.ac.uk
Dr. Sophie Rutter
s.rutter@sheffield.ac.uk

وافقت لجنة أخلاقيات البحث بجامعة شيفلد على نموذج الموافقة وهو متاح للعرض هنا:
<https://www.sheffield.ac.uk/rs/ethicsandintegrity/ethicspolicy/fMore-guidance/homepage>



Kuwait University
Faculty of Medicine



Informed Consent Form for Individuals 18 years and older

Title of the Project: Information literacy conceptions among medical undergraduate students: A case study of the Faculty of Medicine, Kuwait University.

The aim of this research is to develop a model of information literacy (IL) for Kuwaiti medical students. The achievement this aim depends on fulfilling the following objectives.

- 1- Investigate the current state of IL education practices in the Faculty of Medicine at KU.
- 2- Discover the perceptions of IL held by medical students, academics and librarians at KU.
- 3- Identify the factors which have an impact on the effective deployment and implementation of strategic IL programmes in the Faculty of Medicine at KU.
- 4- Develop recommendations for an effective information literacy programme in the Faculty of Medicine at KU.

Age range of participants: 18 years and above

The procedures involved in this study include:

- Answering a series of questions on this interviewing instrument, which should only take the medical academics and students about 45-60 minutes to be completed while focus group discussion should only take library personnel within the HSC about maximum 2 hours for once.
- There is no measurements e.g. height/weight will be taken and made in this study.

There is no blood samples will be drawn within the scope of this research.

For the purpose of this research, medical records will not be accessed.

There are no risks to you if you participate in this research. Your participation will increase knowledge about this important issue. All information collected will remain confidential. Neither your name nor address will be recorded in any assessment. There is no obligation or compulsion for you to participate, and you have the freedom to agree or not agree to participate. This will not have any effect on your academic standing and your employment status. You may withdraw from the research at any time. This research does not include any medical experiments, taking biological samples, or intervening any treatment plan set by your physician.

Please indicate (✓) below if you wish to participate or decline to do so:

- I wish to participate. Name of participant: _____
- I do not wish to participate. Signature of participant: _____

Thank You for Your Cooperation . . .

Student name(s): Fahad ALenezi

Supervised by: Ms. Sheila Webber & Dr. Sophie Rutter Date:



جامعة الكويت
كلية الطب



إقرار مستنير للمشاركين بالدراسة البالغة أعمارهم 18 عاما أو أكثر

عنوان الدراسة: مفاهيم ثقافة المعلومات لدى طلبة كلية الطب: دراسة حالة كلية الطب في جامعة الكويت
الهدف من هذه الدراسة هو: تطوير نموذج او اطار في تدريس مهارات ثقافة المعلومات لدى طلبة كلية الطب. حتى يتم
انجاز هذا الهدف , ينبغي التحقق من ممارسات تعليم مهارات ثقافة المعلومات في كلية الطب, اكتشاف تصورات ومفهوم
ثقافة المعلومات لدى كل من الطلبة, الاكاديميين والعاملين في مكتبة كلية الطب. واخيرا تحديد العوامل التي قد تساهم في الحد
من التطبيق الفعال لمثل هذه البرامج.

الفئة العمرية التي سيتم دراستها: ١٨ سنة فما فوق

الإجراءات المتبعة في هذه الدراسة تتضمن التالي:

- الإجابة على عدد من الاسئلة في المقابلة الشخصية لكل من الاكاديميين والطلبة تستغرق ما بين 45 الى 60 دقيقة بحد اقصى. بينما الإجابة على اسئلة مقابلة المجموعة المركزه للعاملين في مكتبة كلية الطب يجب الا تستغرق اكثر من ساعتين لمره واحده فقط.
- لا يوجد هناك اي قياسات مثل الطول والوزن سوف تؤخذ او تسجل في هذه الدراسة.

لا يوجد هناك اي عينات دم سوف تسحب خلال نطاق هذه الدراسة.

لغرض هذه الدراسة, سوف لن يتم الاطلاع على اي سجلات طبية.

لن تتعرض للمخاطر اذا شاركت في هذه الدراسة. مشاركتك سوف تزيد من معرفتنا بهذه القضية الهامة. جميع المعلومات التي سيتم جمعها ستظل سرية ولن يتم تسجيل اسمك ولا عنوانك في أي تقييم. المشاركة في هذه الدراسة اختيارية و ليست اجبارية، ولك كامل الحرية في الموافقة او عدم الموافقة في المشاركة علما بأن عدم الموافقة لن تؤثر على تحصيلك الأكاديمي أو على وضعك الوظيفي. لك كامل الحرية بالتراجع/ الانسحاب عن المشاركة في هذه الدراسة في أي وقت. ولا يتضمن هذا البحث أي تجارب طبية أو أخذ عينات حيوية أو إجراء فحوصات أو التدخل في خطة العلاج الموضوعه من جانب الطبيب المعالج.

يرجى وضع علامة (✓) أذناه إذا كنت ترغب في المشاركة أو الامتناع عن القيام بذلك:

أرغب بالمشاركة اسم المشارك في الدراسة: _____

لا أرغب بالمشاركة توقيع المشارك في الدراسة: _____

نشكر لكم حسن تعاونكم.

اسم الطالب: فهد العنزي

اسم المشرف على الدراسة:

Ms. Sheila Webber & Dr. Sophie Rutter

التاريخ:



Participant Information Sheet (Medical undergraduate students)

1. Research Project Title:

Information literacy conceptions among medical undergraduate students: a case study of the Faculty of Medicine, Kuwait University (KU).

Dear participants,

My name is Fahad ALenezi, and I am researcher in PhD program in Sheffield University, Information School, Sheffield, U.K. Undertaking semi-structure interviews and group discussion with participants who are part of my thesis. My research has received ethical approval from the University of Sheffield.

2. What is the research purpose?

The aim of this study is to develop a model of Information Literacy (IL) for Kuwaiti medical students. The achievement this aim depends on fulfilling the following objectives.

RO1: Discover the conceptions of IL held by medical students, academics and librarians in the FOM at KU.

RO2: Investigate the current state of IL education practices in the FOM at KU.

RO3: Identify the medical students' requirements of IL within the context of the FOM.

3. Why have I been chosen?

I will undertake a set of semi- structured interviews with medical academics and undergraduate students, and focus group discussion with librarians, to explore their perceptions towards Information Literacy (IL) phenomena and to identify the factors which have an impact on the effective deployment and implementation of strategic IL programmes in the Faculty of Medicine at KU.

You have been invited to a semi-structured interview since you are Medical Undergraduate Students of the Faculty of Medicine at Kuwait University (KU). Given your views, opinions

and perceptions of Information Literacy (IL) are invaluable as part of this research. In particular, we are inviting the medical undergraduate students who are in the three different phases distributed on the all seven years of medical programme in the Faculty of Medicine at KU. The interviews, in general will involve questions about IL conceptions, information need for Problem-Based Learning class, challenges encountered while searching for information, IL conceptions changed by the module of “Introduction to Computers in Medicine”, the importance of IL to your educational achievement, IL requirements for clinical students, and the role played by IL skills in solving clinical problems.

4. How long is each interview, and will I be recorded?

The interview is estimated to range from 30 to 60 minutes, and as part of consenting to taking part in this study, the interview will be recorded, and then transcribed into text by the researcher. The recording will not be labelled with any personal information such as your name or date of birth, and it will be listened by only the researcher and his supervisors. All interview recordings and the transcripts will be destroyed after a year of being awarded the Ph.D. by the lead researcher (e.g. May 2023).

5. What are rights for participant?

Participation in this study will be voluntary, and you can withdraw from this research at any time. You can refrain from answering any question in the interview, and you have the right of asking any question anytime that is related to this study. Additionally, you have the right to end interview without any reason.

6. What are benefits and risks for participants?

In relation to potential harm to participants, the risks of participating are the same as those experienced in everyday life. This research aims to contribute theoretically to the IL field by enhancing our understanding of the role of IL models and frameworks as guidelines for teaching IL. The findings which emerge from this study will fill the knowledge gap that is not extensively explored in the literature, by developing the IL model for the Faculty of Medicine in the context of Kuwait.

Therefore, although there will be no direct benefit to participants, practically, this study will add positive value to those who are working in the educational field and healthcare environment in the context of Kuwait. The present research could form the basis for the design of a more effective IL curriculum: the model that will be developed can be used as a guideline by medical librarians and faculty to review their IL teaching and learning practices.

7. What will we do with the data?

Following the university policies, the data (generated from survey and interviews) will be stored in a password-protected system. It will be stored in the researcher's University of Sheffield Google Drive account. Additional copies of all research data will also be stored on an external drive and departmental laptop for backup purposes. All will be encrypted and password-protected and held in a secure and locked place when not in use. The lead researcher will transcribe the interviews and thematically analyse the data as well. Qualitative data will be analysed thematically using Nvivo software. The use of paper copies will be avoided unless essential and will be kept in locked storage in the Information School. The papers will be destroyed as soon as they are no longer needed.

Due to the nature of this research, other researchers may likely find the data collected to be useful in answering future research questions. For that reason, we would like to deposit the anonymized transcripts of the interviews to the Sheffield ORDA and embedded links to them in the final dissertation. Thus, we will ask for your explicit consent for your data to be shared in this way.

Your completed consent form will be held in securely locked storage in the Information School. It, as with other personal information, will be confidentially destroyed after a year of being awarded the PhD for the lead researcher.

8. Will my participation be confidential?

All the information that we collect about you during the course of the research will be kept strictly confidential and will only be accessible to members of the research team. You will not be able to be identified in any reports or publications unless you have given your explicit consent for this. If you agree to us sharing the information you provide with other researchers (e.g. by making it available in a data archive) then your personal details will not be included unless you explicitly request this. Data collected will be stored securely in a manner consistent with the General Data Protection Regulations (GDPR). All research data collected in this research will be stored on the University of Sheffield password encrypted drive. Printed documents will be stored in a locked cabinet, and they will be only accessed by the researcher. The audio recordings will be used only for analysis purpose. No other use will be made of them without obtaining your written permission, and no one outside the study will be allowed to get access to the original recordings. The interviewer will take notes on the discussion but any information you give during the interview will be fully anonymised and combined with the views and experiences of other participants who agree to take part.

9. What will happen to the results of the research project?

The results will be included in my dissertation which will be available on open access in the White Rose theses repository once the PhD had been granted, and that it will also be included in other scholarly publications and presentations.. The PhD thesis will be publicly published in the White Rose System [<http://etheses.whiterose.ac.uk>].

10. What is the legal basis for processing my personal data?

This research is governed by the legislation concerning data protection which is in force in the United Kingdom, and administered by the University of Sheffield. Further information about this legislation can be found on the website of the University of Sheffield <https://www.sheffield.ac.uk/govern/data-protection/privacy/general>.

11. Who is the Data Controller?

The data controller will be the University of Sheffield.

If you want to contact the researcher that related to study contact by email:

fsalenezi2@sheffield.ac.uk

If you have question that is related to the research you can contact his my supervisors:

First supervisor: Ms. Sheila Webber (s.webber@sheffield.ac.uk)

Second supervisor: Dr. Sophie Rutter (s.rutter@sheffield.ac.uk)

Name of participant:

Date:

Signature:

Name of Researcher [Fahad ALenezi]

Date:

Signature:

Note: Further information, including details about how and why the University processes your personal information, how we keep your information secure, and your legal rights (including how to complain if you feel that your personal information has not been handled correctly), can be found in the University's Privacy Notice <https://www.sheffield.ac.uk/govern/data-protection/privacy/general>.

If you have any difficulties with, or wish to voice concern about, any aspect of your participation in this study, please contact Dr Paul Reilly, Research Ethics Coordinator, Information School, The University of Sheffield (ischool_ethics@sheffield.ac.uk).



Participant Information Sheet (Medical Librarians)

1. Research Project Title:

Information literacy conceptions among medical undergraduate students: a case study of the Faculty of Medicine, Kuwait University (KU).

Dear participants,

My name is Fahad ALenezi, and I am researcher in PhD program in Sheffield University, Information School, Sheffield, U.K. Undertaking semi-structure interviews and group discussion with participants who are part of my thesis. My research has received ethical approval from the University of Sheffield.

2. What is the research purpose?

The aim of this study is to develop a model of Information Literacy (IL) for Kuwaiti medical students. The achievement this aim depends on fulfilling the following objectives.

RO1: Discover the conceptions of IL held by medical students, academics and librarians in the FOM at KU.

RO2: Investigate the current state of IL education practices in the FOM at KU.

RO3: Identify the medical students' requirements of IL within the context of the FOM.

3. Why have I been chosen?

I will undertake a set of semi- structured interviews with medical academics and undergraduate students, and focus group discussion with librarians, to explore their perceptions towards Information Literacy (IL) phenomena and to identify the factors which have an impact on the effective deployment and implementation of strategic IL programmes in the Faculty of Medicine at KU.

You have been invited to a focus group since you are Medical Librarians. Given your professionals experience in Information Literacy (IL) your views, opinions and perceptions are invaluable as part of this research. In particular, we are inviting the librarians who are working

at the Training and Information Literacy Department (TILD) and directly related to delivering IL sessions at Health Science Centre Library HSCL at Kuwait University (KU). The focus group discussion, in general will involve questions about IL conceptions, the importance of IL competencies to undergraduate medical students' academic attainment, IL educational practices at HSCL and the main factors that affect the strategic implementation of IL programmes in the Faculty of Medicine at KU.

4. How long is each interview, and will I be recorded?

The focus group is estimated to range from 60 to 90 minutes, and as part of consenting to taking part in this study, the discussion will be recorded, and then transcribed into text by the researcher. The recording will not be labelled with any personal information such as your name or date of birth, and it will be listened by only the researcher and his supervisors. However, the discussion will not be recorded if any one of the participants of the focus group is not willing for the discussion to be recorded. All recordings and the transcripts will be destroyed after a year of being awarded the Ph.D. by the lead researcher (e.g. May 2023).

5. What are rights for participant?

Participation in this study will be voluntary, and you can withdraw from this research at any time. You can refrain from answering any question in the interview, and you have the right of ask any question anytime that is related this study. Additionally, you have the right to end interview without any reason.

6. What are benefits and risks for participants?

In relation to potential harm to participants, the risks of participating are the same as those experienced in everyday life. This research aims to contribute theoretically to the IL field by enhancing our understanding of the role of IL models and frameworks as guidelines for teaching IL. The findings which emerge from this study will fill the knowledge gap that is not extensively explored in the literature, by developing the IL model for the Faculty of Medicine in the context of Kuwait.

Therefore, although there will be no direct benefit to participants, practically, this study will add positive value to those who are working in the educational field and healthcare environment in the context of Kuwait. The present research could form the basis for the design of a more effective IL curriculum: the model that will be developed can be used as a guideline by medical librarians and faculty to review their IL teaching and learning practices.

7. What will we do with the data?

Following the university policies, the data (generated from survey and interviews) will be stored in a password-protected system. It will be stored in the researcher's University of Sheffield Google Drive account. Additional copies of all research data will also be stored on an external drive and departmental laptop for backup purposes. All will be encrypted and password-protected and held in a secure and locked place when not in use. The lead researcher will transcribe the interviews and thematically analyse the data as well. Qualitative data will be analysed thematically using Nvivo software. The use of paper copies will be avoided unless essential and will be kept in locked storage in the Information School. The papers will be destroyed as soon as they are no longer needed.

Due to the nature of this research, other researchers may likely find the data collected to be useful in answering future research questions. For that reason, we would like to deposit the anonymized transcripts of the interviews to the Sheffield ORDA and embedded links to them in the final dissertation. Thus, we will ask for your explicit consent for your data to be shared in this way.

Your completed consent form will be held in securely locked storage in the Information School. It, as with other personal information, will be confidentially destroyed after a year of being awarded the PhD for the lead researcher.

8. Will my participation be confidential?

All the information that we collect about you during the course of the research will be kept strictly confidential and will only be accessible to members of the research team. You will not be able to be identified in any reports or publications unless you have given your explicit consent for this. If you agree to us sharing the information you provide with other researchers (e.g. by making it available in a data archive) then your personal details will not be included unless you explicitly request this. Data collected will be stored securely in a manner consistent with the General Data Protection Regulations (GDPR). All research data collected in this research will be stored on the University of Sheffield password encrypted drive. Printed documents will be stored in a locked cabinet, and they will be only accessed by the researcher. The audio recordings will be used only for analysis purpose. No other use will be made of them without obtaining your written permission, and no one outside the study will be allowed to get access to the original recordings. The interviewer will take notes on the discussion but any information you give during the interview will be fully anonymised and combined with the views and experiences of other participants who agree to take part.

9. What will happen to the results of the research project?

The results will be included in my dissertation which will be available on open access in the White Rose theses repository once the PhD had been granted, and that it will also be included in other scholarly publications and presentations.. The PhD thesis will be publicly published in the White Rose System [<http://etheses.whiterose.ac.uk>].

10. What is the legal basis for processing my personal data?

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11. Who is the Data Controller?

The data controller will be the University of Sheffield.

If you want to contact the researcher that related to study contact by email:

fsalenezi2@sheffield.ac.uk

If you have question that is related to the research you can contact his my supervisors:

First supervisor: Ms. Sheila Webber (s.webber@sheffield.ac.uk)

Second supervisor: Dr. Sophie Rutter (s.rutter@sheffield.ac.uk)

Name of participant:

Date:

Signature:

Name of Researcher [Fahad ALenezi]

Date:

Signature:

Note: Further information, including details about how and why the University processes your personal information, how we keep your information secure, and your legal rights (including how to complain if you feel that your personal information has not been handled correctly), can be found in the University's Privacy Notice <https://www.sheffield.ac.uk/govern/data-protection/privacy/general>.

If you have any difficulties with, or wish to voice concern about, any aspect of your participation in this study, please contact Dr Paul Reilly, Research Ethics Coordinator, Information School, The University of Sheffield (ischool_ethics@sheffield.ac.uk).



Participant Information Sheet (Medical Academics)

1. Research Project Title:

Information literacy conceptions among medical undergraduate students: a case study of the Faculty of Medicine, Kuwait University (KU).

Dear participants,

My name is Fahad ALenezi, and I am researcher in PhD program in Sheffield University, Information School, Sheffield, U.K. Undertaking semi-structure interviews and group discussion with participants who are part of my thesis. My research has received ethical approval from the University of Sheffield.

2. What is the research purpose?

The aim of this study is to develop a model of Information Literacy (IL) for Kuwaiti medical students. The achievement this aim depends on fulfilling the following objectives.

RO1: Discover the conceptions of IL held by medical students, academics and librarians in the FOM at KU.

RO2: Investigate the current state of IL education practices in the FOM at KU.

RO3: Identify the medical students' requirements of IL within the context of the FOM.

3. Why have I been chosen?

I will undertake a set of semi-structured interviews with medical academics and undergraduate students, and focus group discussion with librarians, to explore their perceptions towards Information Literacy (IL) phenomena and to identify the factors which have an impact on the effective deployment and implementation of strategic IL programmes in the Faculty of Medicine at KU.

You have been invited to a semi-structured interview since you are Medical academics who are delivering medical sessions and lectures. Given your professional experience in Information Literacy (IL), your views, opinions and perceptions are invaluable as part of this research. The interviews, in general will involve questions about IL conceptions, the significant

aspects of IL that medical undergraduate students need to achieve their educational attainment and the challenges and barriers that affect medical undergraduate students' effectiveness.

4. How long is each interview, and will I be recorded?

The interview is estimated to range from 30 to 60 minutes, and as part of consenting to taking part in this study, the interview will be recorded, and then transcribed into text by the researcher. The recording will not be labelled with any personal information such as your name or date of birth, and it will be listened by only the researcher and his supervisors. All interview recordings and the transcripts will be destroyed after a year of being awarded the Ph.D. by the lead researcher (e.g. September 2023).

5. What are rights for participant?

Participation in this study will be voluntary, and you can withdraw from this research at any time. You can refrain from answering any question in the interview, and you have the right of asking any question anytime that is related to this study. Additionally, you have the right to end interview without any reason.

6. What are benefits and risks for participants?

In relation to potential harm to participants, the risks of participating are the same as those experienced in everyday life. This research aims to contribute theoretically to the IL field by enhancing our understanding of the role of IL models and frameworks as guidelines for teaching IL. The findings which emerge from this study will fill the knowledge gap that is not extensively explored in the literature, by developing the IL model for the Faculty of Medicine in the context of Kuwait.

Therefore, although there will be no direct benefit to participants, practically, this study will add positive value to those who are working in the educational field and healthcare environment in the context of Kuwait. The present research could form the basis for the design of a more effective IL curriculum: the model that will be developed can be used as a guideline by medical librarians and faculty to review their IL teaching and learning practices.

7. What will we do with the data?

Following the university policies, the data (generated from survey and interviews) will be stored in a password-protected system. It will be stored in the researcher's University of Sheffield Google Drive account. Additional copies of all research data will also be stored on an external drive and departmental laptop for backup purposes. All will be encrypted and password-protected and held in a secure and locked place when not in use. The lead researcher

will transcribe the interviews and thematically analyse the data as well. Qualitative data will be analysed thematically using Nvivo software. The use of paper copies will be avoided unless essential and will be kept in locked storage in the Information School. The papers will be destroyed as soon as they are no longer needed.

Due to the nature of this research, other researchers may likely find the data collected to be useful in answering future research questions. For that reason, we would like to deposit the anonymized transcripts of the interviews to the Sheffield ORDA and embedded links to them in the final dissertation. Thus, we will ask for your explicit consent for your data to be shared in this way.

Your completed consent form will be held in securely locked storage in the Information School. It, as with other personal information, will be confidentially destroyed after a year of being awarded the PhD for the lead researcher.

8. Will my participation be confidential?

All the information that we collect about you during the course of the research will be kept strictly confidential and will only be accessible to members of the research team. You will not be able to be identified in any reports or publications unless you have given your explicit consent for this. If you agree to us sharing the information you provide with other researchers (e.g. by making it available in a data archive) then your personal details will not be included unless you explicitly request this. Data collected will be stored securely in a manner consistent with the General Data Protection Regulations (GDPR). All research data collected in this research will be stored on the University of Sheffield password encrypted drive. Printed documents will be stored in a locked cabinet, and they will be only accessed by the researcher. The audio recordings will be used only for analysis purpose. No other use will be made of them without obtaining your written permission, and no one outside the study will be allowed to get access to the original recordings. The interviewer will take notes on the discussion but any information you give during the interview will be fully anonymised and combined with the views and experiences of other participants who agree to take part.

9. What will happen to the results of the research project?

The results will be included in my dissertation which will be available on open access in the White Rose theses repository once the PhD had been granted, and that it will also be included in other scholarly publications and presentations.. The PhD thesis will be publicly published in the White Rose System [<http://etheses.whiterose.ac.uk>].

10. What is the legal basis for processing my personal data?

This research is governed by the legislation concerning data protection which is in force in the United Kingdom, and administered by the University of Sheffield. Further information about this legislation can be found on the website of the University of Sheffield <https://www.sheffield.ac.uk/govern/data-protection/privacy/general>.

11. Who is the Data Controller?

The data controller will be the University of Sheffield.

If you want to contact the researcher that related to study contact by email:

fsalenezi2@sheffield.ac.uk

If you have question that is related to the research you can contact his my supervisors:

First supervisor: Ms. Sheila Webber (s.webber@sheffield.ac.uk)

Second supervisor: Dr. Sophie Rutter (s.rutter@sheffield.ac.uk)

Name of participant:

Date:

Signature:

Name of Researcher [Fahad ALenezi]

Date:

Signature:

Note: Further information, including details about how and why the University processes your personal information, how we keep your information secure, and your legal rights (including how to complain if you feel that your personal information has not been handled correctly), can be found in the University's Privacy Notice <https://www.sheffield.ac.uk/govern/data-protection/privacy/general>.

If you have any difficulties with, or wish to voice concern about, any aspect of your participation in this study, please contact Dr Paul Reilly, Research Ethics Coordinator, Information School, The University of Sheffield (ischool_ethics@sheffield.ac.uk).

RESEARCH

Open Access



Compliance with hand hygiene practices among nursing staff in secondary healthcare hospitals in Kuwait

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Abstract

Background: Hand hygiene (HH) among healthcare workers, especially nurses, is the main preventive measure to control healthcare associated infections but compliance with hand hygiene (CwHH) remains low in various settings including Kuwait. This study aimed to assess the knowledge of, attitudes towards, and CwHH among nursing staff in secondary care hospitals in Kuwait.

Methods: A cross-sectional study was conducted on nursing staff in all six secondary care hospitals in Kuwait. Data on knowledge of, attitudes towards, and self-reported CwHH were collected through a self-administered questionnaire that was developed based on WHO's questionnaire, while the data on actual compliance were objectively collected through direct observation of nurses during routine care by two independent observers using WHO's observation form.

Results: Of 829 nurses approached, 765 (92.2%) responded and participated. Of all participants, 524 (68.5%) were able to list "My Five Moments for Hand Hygiene" fully and appropriately. However, several misconceptions (e.g. air circulation in hospital is the main route of infection) about HH were found among the nurses. CwHH was (25.0%) by direct observation while self-reported compliance was (69.5%) each varied significantly ($p < 0.001$) between different hospitals. Female nurses compared to male nurses and non-Arab compared to Arab nationalities were more likely to report CwHH in multivariable analysis. Several items on knowledge of and attitudes towards HH were also associated with self-reported CwHH.

Conclusion: Observed CwHH among nursing staff in secondary care hospitals in Kuwait was low, which highlights the need to make more efforts to improve HH practices. Interventions that have been used elsewhere and found to be effective may be tested in Kuwait. Despite the good overall knowledge on HH among nurses, there are several misconceptions that need to be corrected.

Keywords: Compliance, Hand hygiene, Nurse, My 5 moments for hand hygiene

Introduction

World Health Organization (WHO) has defined healthcare associated infections (HAIs) as "that affect patients during the process of care in hospitals or other healthcare facilities, which were not present or incubating at the time of admission [1, 2]". HAIs are a major public health problem, which lead to prolonged hospital stays

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