

**An investigation into the development and implementation of educational blogging to develop the learning and skills of student teachers in Saudi Arabia**

**THESIS SUBMITTED FOR THE DEGREE OF DOCTOR OF PHILOSOPHY (PhD)**

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# ABSTRACT

The advent and ubiquity of digital technologies have made a massive impact on the learning styles of students. The learners in the modern era are referred to as ‘millennial learners’ or ‘digital natives’. The educators and policy-makers in the education field have considered the integration of the digital learning technologies, also called social computing or Web 2.0, into the learning environment. The technological affordances of social computing applications, like social blogging technology, in terms of improving skills, construction of knowledge, enhancement of critical thinking and self-reflection have attracted the attention of both teachers and students. The successful development and implementation of social computing applications such as educational blogs, Twitter and Facebook in certain disciplines such as medicine and engineering have already provided a foundation for educational and training institutions in both the developed and developing world to integrate such technologies into their learning and programmes in order to improve performance.

This study aimed to assess the potential value of developing educational blogs to support the learning and skills development of Saudi student teachers. A student teachers educational blog (ST-Edublog) was developed and implemented in order to examine its impact on student teachers’ learning. A mixed methods research design was adopted to address the research question, which involved qualitative and quantitative research approaches. 20 students teachers completed a three surveys, and 20 students teachers took part in focus group interviews and completed reflective diaries.

The findings of the study showed that educational blogs are perceived to be powerful tools for developing the learning and skills of student teachers. In addition, ST-Edublog made a significant impact on student teachers, enhancing their self-determination (i.e. autonomy, competence and social interaction). Furthermore, several factors, including perceived enjoyment, sense of community, compatibility, usefulness and ease of use, impacted on the learning satisfaction of student teachers, which resulted in a positive influence on their professional development. Based on the data, it can be argued that a ST-Edublog has great potential for contributing to the learning and skills development goals of initial teacher education programmes as part of the digital transformation of Saudi education under Saudi Vision 2030.

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**CHAPTER ONE**

## 1.1. Introduction

Researchers investigating the effectiveness of training programmes have worked on developing models for enhancing the learning and skills of teachers (in-service and pre-service) and reported the deficiencies of the traditional training systems when delivering high-quality teacher education (Garet et al., 2001; Gersten et al., 2010; Desimone, 2011; Penuel et al., 2011, Desimone and Garet, 2015; Appova and Arbaugh, 2018). The data from these studies show that traditional approaches are not sufficient to support training outcomes. Empirical support from Sun (2009) of blogging technologies for Malaysian students raised the issue of the promising role of online technologies in increasing the effectiveness of the traditional training and skills development programmes for student teachers. Thus, online technologies might have some role in increasing the quality of educational programmes in Saudi Arabia.

Despite the availability of physical infrastructure, careful planning, and management of teacher training programmes in Saudi Arabia, feedback on the satisfaction of teachers with the professional development programmes is less than positive. Wei et al. (2009) reported low attendance of teachers at meetings, workshops and training sessions (short-term) organised under the professional development programmes in the US. The majority of teachers complained of the lack of opportunity for face-to-face interaction and collaborations with their instructors due to their working in large groups. In addition, opportunities for self-reflection and self-evaluation on training programmes could not be organized due to the shortage of time and staffing (Wei et al., 2009; Borko, 2004; Van Es and Sherin, 2008). Feedback from the teacher training courses often highlighted particular issues relating to their experience, the ability to harness technological developments for teaching students, and the problem of developing the relevant curricula from the abundant sources of knowledge available through online channels.

The survey conducted by the Organization for Economic Co-Operation and Development (OECD.), which included 75,000 teachers from 26 countries, reported that teachers have less opportunity globally to engage effectively in content-specific learning opportunities in traditional professional development programmes (OECD, 2009). The OECD’s report (2009) on educational programmes in developing countries found that most teacher training programmes organised by their institutions could not meet the teachers’ learning needs, had less impact on improving the competency, and included ‘no suitable professional development on offer’. This indicated the need for some alternative formats and strategies for motivating and training teachers effectively in developing countries, so that they might attain the skills and learning needed to improve the academic performance of students (OECD 2009). Heystek and Terhoven (2015) showed similar results for teachers’ development programmes implemented in South Africa, indicating the inefficacy of the traditional approaches to improve teachers’ professional development. These data can be extrapolated to the Saudi Arabian educational context, as it is also a developing economy, and it can be argued that traditional methods need to be improved through alternative training methods such as integration of online technologies into training courses developed for student teachers.

Beldarrain (2006) reviewed the role of emerging social technologies such as InstaColl, Imeem and Writeboard, observing that they have changed educational settings and added new opportunities for learning and training programmes for teachers. Advances in technological applications have led to the development of novel opportunities for teaching students in the distance education field. Communicative approaches have been developed to harness the power of technology in education. According to Jin (2009, p. 32), the communicative approach 'is a set of principles about teaching including recommendations about method and syllabus where the focus is on meaningful communication not structure, use not usage'. The application of technologies in education gave birth to a new system known as computer-mediated communication (CMC), which is mostly applied to improving student learning in the area of Communicative Language Teaching (CLT). Specifically, the blend of communicative technologies with the Internet produced a shift from traditional learning to online learning systems (Beldarrain, 2006). These findings further provide an insight into the value and potential of online technologies in increasing the professional development of teachers in Saudi Arabia. However, currently, there is a scarcity of data regarding the efficacy of online technologies in the Saudi educational context for improving the professional development of student teachers.

In support of web-based online technologies, Godwin-Jones (2003) suggested that Web tools including social application software could contribute to student learning if they are used under the control of educational institutions. They further highlighted that these tools include first- and second-generation Web tools such as discussion boards and emails are examples of the first type, which were developed in the first stages in the development of the Internet. The 2nd Generation tools involve podcasts, wikis and weblogs/blogs which offer learning services to users in an intercative environment. Similarly, Thomas argues that:

*Web 2.0 technologies burst onto the scene less than half a decade ago, and while a great deal of potential exists in areas such as virtual worlds, blogging, wikis, and podcasting, they are still used by a minority rather than a well- informed majority of instructors or learners*.

Thomas (2011, p.10)

Young (2003) also supported the increasing role of information communication technology (ICT) within classrooms in order to bring language learning and teaching into a new era of innovation after two decades of use, particularly in the field of English as a second language (ESL). They further argued that the Internet has moved Computer-Assisted Language Learning (CALL) from a cognitive approach to a socio-cognitive approach and the use of CMC is making the environments of language learning “more socially interactive, collaborative, communicative and student-centered” (p. 448).

Since Hymes (1971) and Canale and Swain (1980) discussed the idea of communicative competence and its implications for language teaching, CLT (Communicative Language Teaching) has become prominent (Kleinsasser and Sato, 1999). The prominence of CLT was the most featured change in language teaching in the last century and its ramifications are still felt. The communicative approach to teaching English, which emerged in the 1970s, became a driving force that shapes the planning, implementation and evaluation of English Language Teaching (ELT) programmes in most parts of the world (Canale and Swain, 1980; Nunan, 2004; Thompson, 1980, as cited in O'Sullivan and Stoynoff, 2012).

Frade and Borges (2006) was of the view that the communicative approach starts from a theory of language as communication. Therefore, Harmer (1991) placed great emphasis on training students to use language for communication. Despite the fact that there is an abundance of literature on the communicative dimensions of language, only a small amount has been written about the learning theory justifying it. Theories that underlie CLT have been described in more recent accounts (Frade and Borges, 2006) but of all these theories, no specific one dominated the justifications of CLT as an approach. Jager-Vanderwal (2004) argued that an interactionist view of language learning has had a great effect on this approach since the 1880s. CLT principles and the interactionist model of computer use in language learning found support in Vygotsky's theory and constructivism (Van der Wal, 2004; Frade and Borges, 2006).

Frade and Borges (2006) quoted Vygotsky's learning theory, and put an emphasis on the importance of social interaction in the learning process. Jager-Vanderwal (2004) posited that constructivists say that to acquire language is to understand it, and by interacting with others, such understanding is collaboratively constructed. Sharpe and Benfield (2005) suggested that many e-learning developments have been based on social constructivist approaches, which aim to change the roles of students and tutors in ways which are dramatic and obvious online. In brief, CLT, as described by Jager-Vanderwal (2004), is a paradigm shift which introduced the proficiency-based language learning model that played a vital role in improving foreign language instruction. Marmini and Zanardi (2007) suggested the emergence of two types of courses as a result of an integration of online communicative technologies into learning and teaching setups, which include online-only courses and blended-mode courses based on a combination of traditional and online methods. From these categories the blended mode of learning gained momentum at academic institutions because it combines traditional and online learning modes and the flexibility of delivering curricular content using different means (Ginns and Ellis, 2007; Zacharis, 2015).

In summary, the key message derived from the literature discussed here is that social applications and online technologies have proved their potential in the field of distance education, and for improving the reading and writing skills of students learning English as a second language. However, there are limited data regarding the efficacy of online technologies in improving training programmes for teachers in developing countries. Based on this, it can be argued that it Is important to explore how far social media applications can contribute to the improvement in learning and skills of student teachers in Saudi universities. As this study is set in the educational context of Saudi Arabia with its focus on advancing the training objectives for student teachers, it is important to discuss the background of higher education in Saudi Arabia. The next section will describe the context of the study.

## 1.2. Context of the study

This section describes the research context. As this research is designed in the higher education context of Saudi Arabia, the first subsection introduces the country’s demographic features, followed by an overview of the higher education system. Technological opportunities and their integration are discussed along with the trends of students adopting learning technologies.

### 1.2.1. Saudi Arabia: demographics features

Saudi Arabia is the largest country in the Arabian Peninsula, with a population of 29.19 million. In the South, it borders Yemen, and to the South-West of Saudi Arabia, Oman is located. United Arab Emirates lie to the East, while Iraq is located to the North-East. Iran, Syria, Lebanon and Jordan are located to the North of Saudi Arabia (De Bel-Air, 2014; Vassiliev, 2013) (Figure 1.1).



Figure 1.1: Position of Saudi Arabia on the world map, showing its neighbouring countries.

The country is blessed with natural resources including gas reservoirs, minerals and oil, which have all provided a great impetus to the Saudi economy in the last three decades. The Saudi government emphasises the importance of the continuous development of the economic and social infrastructures, which in return demands the recognition of advances in the domains of technology, science and research (Mallakh, 2015).

As a result, the education industry of Saudi Arabia is expanding rapidly with the establishment of new universities, research institutions and degree-awarding institutions throughout the country as part of the economic development plan for the country. Free education from pre-school to university is provided to all citizens, as well as training for teachers and students to support their functions in the relevant professions (Prokop, 2003; Al-Rasheed, 2013).

### 1.2.2. Higher education in Saudi Arabia

The Saudi Arabian government showed its commitment to improving the education of students and teachers through continuous incremental additions to its budget. For example, the education sector was the recipient of the largest share of the budget, compared to other sectors (Figure 1.2). The report stated that an increase in the education budget was to provide a high-quality, value-added education to all citizens through the incorporation of emerging technologies including Artificial Intelligence and Industry 4.0, which involves the internet of things, and social and cognitive computing.

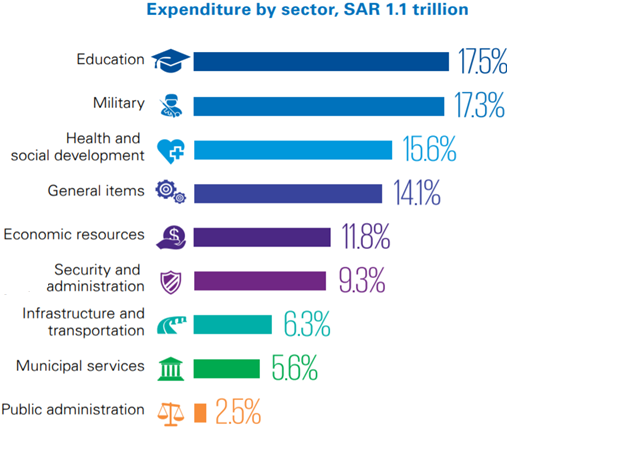


Figure 1.2: Expenditures by sector in Saudi Arabia taken from Kingdom of Saudi Arabia (KSA) 2019 budget highlights. The percentages show the increase in expenditures compared to the KSA 2018 budget highlights.

The Saudi government introduced several new degree-awarding institutions and universities to fulfil the higher educational needs of the increasing Saudi population. Currently, there are 40 universities and 35 ‘degree-awarding’ institutions in Saudi Arabia (Figure 1.3), which cater to a variety of their citizens’ educational needs in the teaching, medicine and engineering sectors, and so on.

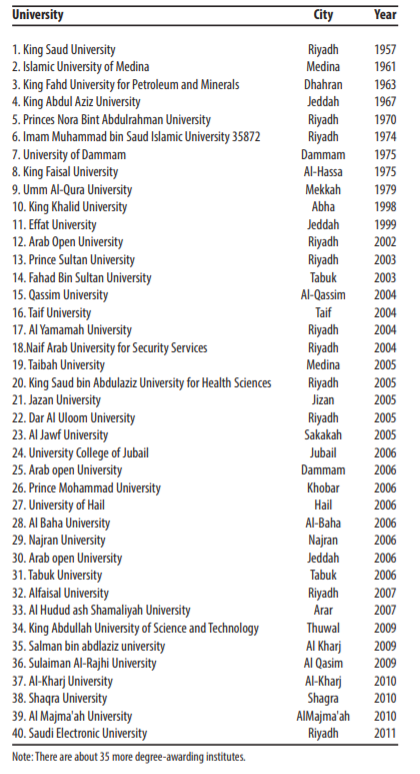


Figure 1.3: Number of Saudi universities with location and year of establishment (Source: Meo, 2015)

Meo (2015) reported that 6.7 million students were studying in the Saudi universities and degree-awarding institutes. He further showed that 124,000 students were studying abroad to obtain higher education from prestigious universities in the developed world.

These data discussed in this section highlight the increasing number of educational institutions aiming to provide quality education to Saudi students. The government has increased funding and resolved to improve the quality of education through several initiatives which have opened the way for instruction via social technologies into the educational programmes delivered at Saudi universities. The next section outlines opportunities for technological integration in Saudi Arabia in the light of the recently introduced government initiatives.

### 1.2.3. Opportunities for technological integration in Saudi education

There are now many opportunities for developing the integration of technology in Saudi Arabia. Beldarrain (2006) described the utilities of many applications, including voice and video conferencing, whiteboards, interacive tools for presention, applications for sharing information, live chats and e-mails, which develop the interaction and collaboration between students and teachers. Nevertheless, he notes the importance of the second-generation technologies in fostering the sense of connectedness between members of a group. The Saudi government has paved the way for reaping the benefits from the affordances offered by digital learning technologies in the Vision 2030 programme.

Vision 2030, which was launched in April 2016, places emphasis on ‘digital transformation’ through the creation of five common digital platforms among the public entities, the launching of 29 digital initiatives in virtual sectors, and the investment in a number of national digital assets. In 2017, the Ministry of Education (MOE) started to implement the goals of the Education Digital Transformation Programmes by offering educational services for educators and learners in the higher education sector and in schools. The MOE also encouraged researchers to investigate, develop and implement digital learning platforms in order to foster innovation and creativity (MOE, 2019). As part of the Saudi digital education strategy, the MOE launched several initiatives including digital skills development programmes for teachers, improving pedagogical practices by enhancing the use of digital applications like interactive whiteboards, and transferring the curriculum and contents to digital platforms in order to improve accessibility for learners (Pahnwar et al, 2017). Moreover, academic staff capacity-building measures, via the development and implementation of innovative digital platforms, are at the core of transforming education through the incorporation of digital technologies. The development of Smart Schools and National Learning platforms are some additional initiatives which have gained popularity among academics and learners (Nurunnabi, 2017).

The MOE aims to replace the traditional learning experience for learners in schools and universities with an interactive digital learning environment, promoting technological adoption among learners in higher education to gain constructive educational experiences. Platforms and discussion boards for sharing course material and exchanging feedback on activities and assignment are the prime objective of Vision 2030. The MOE has also trained 150 teachers in phase 1 to teach students how to use digital technologies, and in phase 2 (2018/2019), it intends to train 350 teachers by 2019, and 1000 teachers by 2022. Based on the goals of Vision 2030 and initiatives launched by MOE, it can be argued that digital technologies present a tremendous opportunity in Saudi educational institutions for transforming pedagogical and training strategies for students and pre-service teachers. Moreover, Vision 2030 provides guidelines for adoption of the digital technologies in order to build learners’ creative skills, their programming and computational thinking, and designing, delivering and evaluating the learning and training events in higher educational institutions (MOE, 2019).

#### 1.2.3.1. Digital literacy trends in Saudi Arabia

The Saudi Gazette (2018) published a study conducted by Cambridge Assessment International Education about ‘digital literacy in Saudi schools’. The survey identified that 16.6 percent of Saudi students were reported using smartphones as an educational aid. There were also 14 percent of students that used iPads and tablets in order to find further information about the contents of lessons delivered by teachers. Interactive whiteboards are being used as part of their teaching strategy by 50 percent of teachers during lessons in Saudi Arabia, which is higher than in the US, Spain and China.

Although the newer online learning technologies are being utilised in Saudi Arabia, however, the statistics relating to traditional learning methods have not changed much. The Saudi Gazette (2018) revealed that, globally, 18 percent of teachers were still dependent on the blackboard for teaching students, while 82 percent of the students were still using pen and paper in the classroom. These data indicated that many teaching staff and students employ traditional classroom-based training methods for learning new concepts and knowledge. It is not clear from this survey how many of these teachers and students also use online learning technologies.

Some studies have shown that some private schools launched ‘digital school bags’ by introducing activity sheets and textbooks stored in tablets (Alshahrani and Al-Shehri, 2012; Nassuora, 2012). Nevertheless, the public-sector-based educational institutions in Saudi Arabia are finding it hard to implement digital technologies to promote learning due to the predominant view among students that learning tools are entertainment applications (Mohamed et al., 2008). The integration of such technologies for learning purposes through changing the attitude of students and teachers is a major hurdle for widespread integration of learning technologies across Saudi educational institutions. A huge problem lies in motivating learners to adopt digital learning technologies to maximise their learning and skills. This warrants further research in order to investigate the motivational affordances of digital technologies in the context of Saudi educational and training institutions.

Teacher training systems constitute an important component of the educational system in any country. Saudi Arabia’s higher educational system is committed to training teachers in order to foster economic and social developments through training and developing human resources. Nevertheless, Abo Kodher (2015) argues that the educational system in Saudi Arabia is facing some challenges such as the lack of quality output from educational processes in the form of successful students, and the low capacity among staff to keep up with modern educational technological updates.

Smith and Abouammoh (2013) believe that traditional systems fail to meet the needs of learners who are technologically savvy, and who spend more time with digital gadgets and social media applications in order to develop their learning, update information and gain skills such as communication, interpersonal communication, reading, writing and reflection (Alamer, 2014). In this scenario, several scholars have argued that digital learning technologies are the most suitable alternative to target the needs of learners in Saudi Arabia, which is due to the dependence of Saudi students on communicating with peers and teachers (Elyas and Picard, 2013; Alnahdi, 2014; Alamer, 2014).

However, the educational and training systems in Saudi Arabia, especially pre-service teacher education and training systems, could not keep up with the pace of technological advances and integration of technology into learning systems, in contrast with other sectors such as petroleum, health, engineering and agriculture (Al-Otaibi, 2007). Khodan and Abdulrahman (2014) stressed the urgent need to develop teachers' performance through online technological interventions, which would most likely represent great value for the investment in upgrading the educational infrastructure to meet the organisational productivity objectives. Educational institutions need to move away from traditional methods and take the benefits from technology-assisted remote communication to cover all educational training needs for students at different levels of educational programmes. They further argued that universities and schools cannot give their students the whole experience, thereby qualifying them for the labour market, by only traditional methods. This is due to a reliance on the traditional methods of teaching, training teachers, and educating students.

Al-Jarf (2006) argues that integration of technology into the educational system within Saudi Arabia is hampered by the lack of the organisational support, as the leadership of the educational institutions are accustomed to the traditional ways of educating and training students. Al-Zahrani (2015) pinpoints that the lack of the digital infrastructure (computers and laboratories) is another obstacle to successful implementation of digital learning technologies in educational institutions. Abu-Arrad and Fosaiel (2006) suggest that the internet accessibility for teachers and students is not uniform across all educational institutions, which raises another challenge for the implementation of learning technologies.

The most important challenge is the attitude of students and teachers towards the utility of online learning technologies in improving their knowledge and skills, as argied by Al-Kathiri et al. (2015) . Al-Jarf (2007) suggests that there is a lack of empirical research in the area of behaviour and attitude of Saudi students and teachers. The low levels of awareness of the real advantages of technologies also demotivate students and teachers who might use state-of-the-art online technologies for learning and skills development in Saudi Arabia. The poor understanding of Saudi students and teachers about the applications of digital technologies is reported to be a barrier against the effective use of online learning technologies in Saudi educational and training systems (Bingimlas, 2010; Al-Mulhim, 2014). Al-Zahrani (2015) and Al-Mulhim (2014) conclude that there is a paucity of research showing the perceptions of pre-service teachers with regard to online learning technologies. They suggest that future research should focus on investigating the impact of online digital technologies on the learning and skills development of students and teachers in Saudi educational institutions. Therefore, it is paramount that the motivational affordances of online learning technologies for promoting the learning and growth of students are explored.

In summary, the above discussion suggests that the future of digital technologies and their integrative potential within the educational system is quite promising in Saudi Arabia and should be explored through research projects which aim to explore the behaviours and attitudes of learners around acceptance of digital technologies as learning tools. This also opens up avenues for investigating the development and implementation of new digital platforms for increasing the learning and skills of the learners. In this study, I focused on the potential of social networking sites in Saudi higher education for increasing the skills and learning of student teachers. The next section describes the potential of social networking sites as learning tools in Saudi higher education.

#### 1.2.3.2. Adoption of social networking sites in Saudi higher education

Alwagait et al. (2015) conducted a study on the usage of social media platforms such as Facebook and Twitter, and reported that social media could not improve the academic performance of students. The students in this study could not manage the time between leisure activities on social media and the use of social media to learn about their subjects and solve problems. However, another study conducted by Al-Khalifa and Garcia (2013) suggested that the use of social media platforms is promoted by higher educational institutions in Saudi Arabia due to the aptitude of Saudi students for embracing new technologies for learning. They argue that successful implementation was observed in the language, engineering and medicine disciplines. Alsuraihi et al. (2016) explored the usage patterns of medical students on YouTube, Facebook, and Twitter. They found male students mainly preferred to communicate with peers using Wikis and Twitter. YouTube was reported to be the favourite and most commonly visited platform for both male and female students seeking help about course contents. Binsahl et al. (2015) reported on the use of social networking sites, including Facebook and Twitter, among female Saudi students studying in Australia. They found that students mostly use Facebook for maintaining connections with their family members and friends in Saudi Arabia.

A study carried out by Fattah (2016) explored the use of blogs with students from the Qassim University Computer Science department in Saudi Arabia. It was a quantitative study and they found that blogs were an effective learning and teaching tool, with students being very positive about collaboration in the sharing and creating knowledge. A further study conducted at King Khalid University in Saudi Arabia by Faqeeh (2011) found that EFL students also viewed blogs positively, enabling them to create social exchanges and develop interactive relationships with real-time readers. From the perspective of teachers in Saudi higher education, the qualitative study carried out by Alghanmi et al (2018) shows that there are a number of issues around motivating students to use online learning, not least the teachers’ own limitations in using such tools and universities’ policy of blocking the Edublogs site. However, Alghanmi et al (2018) also found that students were resistant to group work and had little confidence in using technology, resulting in a need for teachers to be very dedicated to the process of blended learning to continue the process. This was a study carried out with female university lecturers from one Saudi university; therefore, there might have been a different result if the study had included male students. Findings may also differ according to the specialist subject of the participants, as those with a background in technology or sciences may produce significantly different results from those with a background in humanities.

It is clear that several studies have been conducted to explore the learners’ experience of using ICT in interacting with others and their feedback on the experience (Lin, 2014; Aydin, 2013; Incecay and Genc, 2014). However, it has been revealed that there is limited research on the effectiveness of blogs in an educational context. Although a few studies have emerged from Saudi Arabia, barriers to the use of blogs have been indicated in some universities. There is a need for more research on the use of Edublogs in different contexts within Saudi Arabia to demonstrate whether their effectiveness in promoting learning can overcome the suspicions that some universities may have relating to their usage.

Taken together, there is very little research on the value to participants of blogs in an education context. Blogging has become a phenomenon in its own right, which continues to grow, but the effectiveness of blogging in education and the value of the content shared are not yet clearly understood. The potential of social networking sites has not tapped into the field of training student teachers in Saudi Arabia, as most studies have focused on the application of social networking sites for learning English as a second language and medicine, which leaves a research gap around assessment of the motivational affordances of social networking sites for professional development of pre-service teachers.

Sun (2009) argued that the educational applications of weblogs/blogs are gaining popularity among students and teachers across the world due to their growing role in improving the knowledge of students. Unfortunately, there is little research about the implementation of blogs in education in the Arab World, particularly the Saudi context. In addition, many student teachers at university level in Saudi Arabia, based on my experience as an instructor of student teachers in training programmes, are shy to participate in classroom-based discussions, which might be due to a lack of confidence in communicating with each other, even when they have performed well in their written exams. The time restrictions in the classroom-based learning environment are not a useful motivation for self-reflection and thoughtfulness among students. This motivated me to explore the potential of an Edublog as a technology tool that satisfies some of the educational and social needs of student teachers in Saudi Arabia. Therefore, this study aims to assess the motivational affordances of education blogs in developing the learning and skills of student teachers. The education blog is selected due to its developmental potential for constructive knowledge, as described by studies in this section. The aims and objectives of study are discussed in the next section.

## 1.3. Aim and Research Questions of the Study

The aim of the current study was to investigate the feasibility of implementing blogging technology as a learning tool to develop the learning and skills of student teachers in Saudi Arabia. The overall research question is: “How successful is the use of blogging technology as a tool for developing the learning, skills and self-determination of student teachers in Saudi Arabia?” To address this overarching question, the following subsidiary research questions were as follows:

1. What perceptions do a group of Saudi student teachers have of blogging technology in comparison to other social computing applications (e.g. Facebook, Twitter, Snapchat)?
2. How did Saudi student teachers perceive the ease of use, usefulness, compatibility, enjoyability and interactive elements of the blog used in the Edublog project?
3. What impact did the blog have on student teachers’ development of skills and knowledge?
4. What impact did the blog have on the three key elements of self-determination – autonomy, competence and relatedness - of student teachers?

These are explained further in Chapter Four.

## 1.4. Outline of Thesis

This section describes the outline of the thesis.

This first chapter has presented the context of the study and the rationale for conducting the research on the topic, setting out its aim and research questions. The second chapter discusses the outcomes of previous studies on social computing applications, characteristics of learners, and affordances of blogs as learning tools for improving the knowledge and skills of students. Chapter Three outlines the conceptual framework for the study, together with an extensive discussion of factors relation to an examination of the effectiveness of the proposed blogging platform.

Chapter Four presents the methodological tools that were used to address the research questions. An extensive discussion of research design, and the choice and justification for the chosen research methods are provided in this chapter. Chapters Five, Six and Seven outline the findings. Chapters Five considers the student teachers’ perceptions of social computing applications in general, Chapter Six addresses the second and third research sub-questions, and Chapter Seven considers the data in relation to the effectiveness of the ST-Edublog in improving students’ self-determination, which impacts on learning and development.

The conclusion of the study is presented with a summary of findings in Chapter Eight. This chapter outines the limitations of the study and discusses the implications of the outcomes for research, policy and practice.

## 1.5. Summary

This chapter has elaborated the research background with regard to the integration of digital technologies for developing the skills and knowledge of students. It has been argued that the traditional training methods utilised to train pre-service teachers are insufficient to fulfil the learning needs of students in the modern digital era. This observation motivated me to consider social computing applications as an alternative strategy for developing the knowledge and skills of student teachers in Saudi Arabia. Digital learning technologies can be integrated into the educational and training systems of Saudi Arabia in order to meet the goal of Saudi Vision 2030, which envisions the transformation of the Saudi educational system through digital technologies. Therefore, this study aimed to examine the feasibility of developing and implementing an educational blog to meet the training needs of student teachers. The next chapter presents a literature review of research focused on the pedagogical affordances of digital technologies, and particularly of educational blogs.

# CHAPTER TWO

# LITERATURE REVIEW ON SOCIAL COMPUTING TOOLS IN EDUCATION

## 2.1. Introduction

This chapter aims to provide a detailed discussion of the various concepts related to E-learning 2.0 in order to gain in-depth understanding of the tools being used for educating students in the digital era. The chapter reviews literature concerning the changing learning paradigms in the digital era, and explores the nature and use of Web 2.0/social computing tools to support learning in the digital era. The chapter also considers the affordances and limitations of the use of blogs in an educational setting.

## 2.2. New Learning Paradigms in the Digital Era

This section presents the opportunities and challenges for the education and training systems that arise from the technological advances, which have shaped innovative learning patterns. According to Paily (2013), new learning styles and patterns have emerged from the exposure of the younger generation to the varied digital technologies which influence the way people think, interact, live and learn from their surroundings. Redecker et al. (2009) called the young generation “new millennium learners” who demand specific learning environments, rich with digital technologies, to achieve better learning outcomes from education and learning systems. The next subsection encapsulates the changing attitudes of these NMLs towards learning, the dynamic learning patterns and the associated opportunities for administrators of education and training programmes.

### 2.2.1. New millennium learners

The generation which was born after 1982 was surrounded by digital technologies, which were not only an inextricable part of their lives but also helped shape their social interaction and societal norms, and caused the emergence of different learning patterns. Different authors have described them with different names in order to distinguish them from their predecessors, such as the “Net Generation” (Olbinger and Olbinger, 2005), “Digital Natives” (McLester, 2007), “New-millennial Learners” (Baird and Fisher, 2010), “Millennials” (Pedro, 2006), and “new millennium learners” (OECD, 2009). Some other studies dubbed them the “Gamer Generation” (Carstens and Beck, 2005) due to their attachment to video games and the “Instant Message Generation” due to their use of instant messaging for communication with each other (Lenhart et al., 2001). As all of the aforementioned terminologies represent the same notion of influence of digital technologies on learning and interaction patterns and people’s obsession with digital gadgets, therefore, the term new millennium learners (NML) will be used in further discussion.

The knowledge-management and peer-to-peer communication facilitated by digital technologies are the hallmarks of the NMLs (Pedro, 2012). The ways NMLs entertain themselves and communicate with each other has resulted in new avenues for acquisition of knowledge and skills development. The popular social computing applications which shaped the learning environment due to the preferences of the NMLS for learning included instant messaging, wikis, blogs, and tagging (Baird and Fisher, 2010; Pedro, 2006). The increasing use of social media by the young generation led policy-makers and thinkers in higher education to exploit this opportunity for promoting the knowledge and learning which are at the core of the mission of training and education systems (Chaka, 2010; Ganzerla et al., 2015).

It should be acknowledged that all young people do not fulfil the definition of NMLs, simply because accessibility of the technologies is not even across social strata. Many children in economically weak situations are unable to enjoy state-of-the-art technologies (Unicef ,2017). This is more evident in developing countries, where the division between ‘haves’ and ‘have-nots’ is sharper. It is also recognised that there is a danger in giving all in a particular generational cohort a common title, as everyone is an individual, and there can be as many differences within a generation as across a generation. In addition, the notion of ‘digital natives’ has also been critiqued. However, the definition of NMLs is applied to Saudi young people who have the knowledge of and access to technologies in the context of the present study.

Howe and Strauss (1993) identified seven general characteristics of the Millennial student:

* Millennials feel they are special. A core element has an impact to feeling of specialness is the significant association between students and their parents. Parents play essential role models to the millennial student and they are unique and principal resource for advice in the university life. Getting awards participation in extra-curricular activities has facilitate this feeling.

parents are strongly participated university student life now days and play vital role in decisions related to academic life and both of them represent co-partnership (Howe and Strauss, 2004).

* Millennials are sheltered. Millennials are described as the “core of the all sweeping youth safety movement in American culture.” “Baby On Board” signs and safety of children’s locks similarity this generation developing up with safety as a most priority.
* Millennials are team oriented. They are less pleasure and comfortable when working independently and prefer to working collectively.
* Millennials are confident and highly optimistic. They recognised having full and more strong access and sharing information together whole day, (Prensky , 2000). This lead to instant access and immediate responses. The use of email is considered to be more delayed, while using of messaging and text messaging tools can lead to immediate response.
* Millennials are pressured. They activated on continuous feedback and become more paralyzed, sometimes facing some difficulties to continue, within the absent of feedback and instructions.
* Millennials have a strong desire to achieve. During their childhood, Millennials had feeling that they are unique and are desired to gain good things. In fact, some people think that the Millennials are supposed to be future greatest generation (Lowery, 2001).
* Millennials are conventional. They respect cultural diversities and respect each other and try to leave in good way.

### 2.2.2. Technological expertise

NMLs are described as ‘hardwired’ due to their ability to employ different and multiple web- based participatory social media platforms simultaneously in order to communicate with and learn from each other (Meyers et al., 2013; Williams, 2014). They are characterised as an ‘always-online’ generation, as a technologically savvy generation that has grown up with web-based technological advances. According to Ruthven (2014), NMLs are creative in nature and adept in using new technologies. As they have grown up with these new technologies, they are responsive to new digital ways of communicating information and learning styles, and are well-poised to use a variety of digital media intuitively (Williams, 2014). It should be noted, all NMLs cannot be equally creative with the same abilities to handle digital information in the right manner. Social background, educational status and exposure to a variety of experiences during academic life and professional career are the key determinants of NMLs’ overall characteristics. Some users of digital technologies might not be able to benefit from them, so they might not be called NMLs in the strictest sense.

Some studies have pointed to the shallow nature of the technological knowledge among NMLs (Carstens and Beck, 2005; McLester, 2007). According to Oblinger and Oblinger (2005), while NMLs are able to utilise technological devices without an instructional manual, they lack a detailed and in-depth understanding of the purposes of social computing applications. This lack of understanding has led to the use of such applications to fulfil ordinary daily functions of communication and gaining information about their environment, rather than for acquiring the constructive and productive learning and skills aimed for by training and educational institutions.

### 2.2.3. Changes in the patterns of social interactions

Garcia et al. (2013) suggest that NMLs are open-minded, welcome diversity and variations in opinions and thoughts, and are oriented to share knowledge and information. Kang et al. (2011) argued that NMLs are comfortable with meeting strangers on the Internet, and are happy to be friends of friends. According to McLoughlin and Lee (2008), NMLs are open towards sharing their personal and emotional information with each other. They are connected with each other, whether they are sitting with their families, in class or in social gatherings. They are oriented to work in teams: for example, setting up groups on social media platforms to manage group work, divide tasks and report to each other about their completion. They are open to admit their failures, and share their stories of success and failure with peers (Kaczmarczyk et al., 2013).

Hence, it can be argued that NMLs are highly social in nature and have developed the team spirit to accomplish a variety of tasks of different natures (Chaka, 2010). Baird and Fisher (2010) argue that a peer-to-peer approach among NMLs is found to be common, which strengthens the relationship of NMLs and results in the generation of communities of practice on the Internet. Sometimes, NMLs consider their peers more credible than their parents or teachers. According to McLester (2007), although NMLs are social, they also have prevailing concerns about web-security issues.

The characteristics of sociability and team-work spirit have created opportunities for educational and training institutions to use social media platforms for educating and delivering skills to students (Kang et al., 2011). In addition, communities of practice on the Internet use this avenue for fostering professional learning and skills development among the members of communities such as teachers that use social media applications in the advanced countries to develop each other (Aroldi et al. 2011; Kind and Evans, 2015). However, evidence of the use of social computing applications and establishment of communities of practice is limited due to either late adoption of technologies among the users or less focus from the educational and training institutions on the incorporation of digital technologies into learning and training systems (Allen et al., 2012; Pedro, 2012).

### 2.2.4. Engagement and working attitude

Many learners in the digital era show active involvement in creative activities, solving social problems, individually or in groups. The striking feature of such learners is the continuous engagement with processes, systems and people in their surroundings through social computing applications (Brouns et al., 2007; Ananiadou and Claro, 2009). This not only keeps them updated about the latest developments in their surroundings, but it also motivates them to work together to find solutions to prevalent social issues (Lamb and Johnson, 2012). Many NMLs use social media platforms to talk about things, do things and think about the pressing matters in society (Greenhow, 2008). This offers an opportunity for training and educational institutions to capture the interest of NMLs so that they become engaged in intellectual debates, increasing their interest and belief in the importance of technology and science (Fullan and Langworthy, 2013).

Furthermore, McLoughlin and Lee (2011) reviewed the literature on traditional pedagogical methods versus online pedagogical strategies, and came to the conclusion that NMLs have an experiential nature, learn from their failures and through observations of their surroundings, make discoveries inductively, figure out patterns, and formulate and test hypotheses. Gibson et al. (2015) argue that the foregoing characteristics are vital for gaining utilitarian knowledge, collaborating with others to implement complex projects, and encouraging ‘out-of-the-box’ thinking and risk-taking behaviour to innovate processes and develop together within a community of practice.

Seale (2013) concluded that some NMLs are oriented to take part in community-based activities, which lead to the solution of practical issues such as environmental problems. The continuous engagement of many NMLs with people and technologies may create a sense of achieving goals within a specific timeframe, enabling them to achieve their career ambitions. The ambitious and goal-oriented characteristics of these learners can be captured by education and training providers to set goals for learning and enable learners to achieve them through creating a global collaboration and engagement in the virtual environment (Wolfe and Andrews, 2014; Beetham and Sharpe, 2015). However, this is not a simple task, as it requires the commitment of education providers, and sufficient infrastructure and person-power to deliver the educational resources using social computing applications. There is a need to develop and test the utility of social computing applications-based research projects for refinement of digital-technology-mediated learning among NMLs (Lindsay and Krysik, 2012; Franklin and Hamelen, 2007).

### 2.2.5. Availability and use of multiple media types

According to Al-Qallaf and Al-Mutairi (2016), the visual literacy of NMLs mediated via blogs is very high, which is due to the continuous exposure of fifth-grade students in English as second language classes to the different visual media posted by teachers on blogs. They found that grammar, writing skills and pronunciation of students were significantly improved by the blog-based teaching strategy. The learning capabilities of NMLs are reported by many other studies to increase with image-rich media compared to the media involving textual material, videos and images. Textual materials on the Web are quickly scanned by NMLs, who find the articles and pieces of information with images and explanatory notes more attractive (McLester, 2007; Oblinger and Oblinger, 2005).

The aforementioned data suggest that learners in the digital age may be oriented to learning through images, that presentation of textual material alone may make them bored of the learning process, and that a learner’s attention span may be reduced by text-only material. This offers an opportunity for educational and training institutions to use multiple visual media such as videos, cartoons and other figures to explain basic and key concepts to learners.

Visual content is exchanged between undergraduate students through social media platforms, such as Snapchat, Facebook and blogs, which enables learners to adapt quickly to the learning process, and makes them engage with the learning material. Consequently, the application of visual media for learning in training and academic institutions is more likely to enhance the learning experience of NMLs (Hemmi et al., 2009; Paily, 2013). Hemmi et al. (2009) further proved through a critical review of the literature on technology and training and education of students that social computing technologies have significant potential as a new collaborative, volatile and challenging environment for improving the formal training and education of students in the higher education setting. Similarly, Paily (2013) provided a model based on the integration of social computing applications/Web 2.0 technologies for creating a constructivist learning environment for students in higher educational settings. They argued that the constructivist learning environment refers to a situation in which interaction and connectivity of students and teachers stimulates the exchange of visual and textual materials via social computing applications through collaborative activities and open communication channels, which subsequently results in creating a useful knowledge base for students.

However, there may be some disadvantages to NMLs’ reliance on visual media for learning. It was observed that text literacy had decreased among students that depend on images for learning (Pedro, 2012; Minocha, 2009). Baird and Fisher (2010) recommended that academic and training institutions should motivate learners to interweave texts with images during processes of communication and learning, so that students can experience both textual and visual materials while learning in the classroom environment.

### 2.2.6. Instant communication and concept of accessibility

According to Redecker (2009), the desire to access information immediately has sharpened in learners in the digital technological era. The instant communication characterised by cellular conversations, instant messaging through social media applications and fast-reacting communications is enabled by speedy internet connections (Pedro, 2012; Thompson, 2013). Another study pointed to the instant gratification of learners from learning resources apart from the instant reception of information (McLester, 2007).

The concept of immediacy and fast-paced accessibility of information gave rise to challenges for educational and training institutions (Livingstone, 2012). On one hand, they struggle to finance the dynamic and emerging digital technologies to gratify the needs of learners; on the other hand, they find it hard to control the speed of assimilation of the information provided to the learners (Corn et al., 2011). The immediacy and accessibility can be easily managed when it comes to accessing friends and relatives, responding to a question and contacting services in a particular social domain (Jones and Lea, 2008). Nonetheless, the accuracy of the information and synthesis of new ideas based on it becomes jeopardised with the implementation of speedy delivery of knowledge to students (Teo, 2016). It warrants the development of learning applications with training for learners as to how to use and synthesise new knowledge from the available information. This adds another responsibility to the expanding portfolio of responsibilities of training and educational institutions (Davidson and Goldberg, 2010).

As a result of immediacy, some argue that learners have become impatient, with displays of ‘grasshopper mentality’, which alludes to the desire of learners to skip from one subject to another quickly and without having achieved the desired learning goals from the presented topics (Redecker, 2009). Bouhnik et al. (2014) argued that learners in the digital era display irritated behaviour if they are not given the opportunity to access the information instantly, which can endanger the success of traditional learning systems which tend to deliver the information in segments, such as through workshops, lectures, and training events. The mere reliance on these traditional systems can slow down the learning performance of students (Davidson and Goldberg, 2010; McLoughlin and Lea, 2010). Livingstone (2012) posited that slow progress of students under the traditional learning system necessitates the consideration of developing social computing applications for dissemination of knowledge to students along with traditional methods of learning, so that maximum benefits can be achieved in increasing knowledge and developing the desired skills among learners.

Many studies have pointed to the shortened attention span among NMLs when non-interactive and non-engaging methods are used in the classroom to teach concepts; scholars argue that this results from NMLs’ extremely impatient nature and desire to obtain all relevant information instantly (Thompson, 2013; Davidson and Goldberg, 2010). These studies are often focussed on the effect of social computing applications on the learners of English as a second language and small groups of participants, which might question the generalisability of the outcomes of this research. In addition, there are sometimes methodological challenges to investigating students’ attitudes and behaviour. Therefore, there is a need to conduct studies in a variety of situations to test the real impact of social computing applications in different disciplines of knowledge.

Jones and Lee (2008) also point to the debilitating effect of the alleged short attention span of students on the ability to reflect. The authors conducted studies on undergraduate students in three UK-based institutions by following qualitative and text-based methods. They found that students paid little attention to the nitty-gritty of textual material in the digital environment, which affected their ability to reflect upon the learning material and subsequently construct new knowledge. Corn et al. (2011) supported the outcomes of the study carried out by Jones and Lee (2008) involving tech-savvy teachers. Corn and his colleagues found that tech-savvy teachers were dependent on laptops for teaching students. The short attention span regarding curricula was caused by the adoption of new technologies, which affected the communicative and instructional abilities of teachers in Carolina high schools.

McLoughlin and Lee (2010) concluded that training and educational institutions need to focus on development of interactive and multiple-stimuli-based, engaging methods to increase the attention paid to learning material, so that the desired learning outcomes at the end of training and educational courses might be achieved.

### 2.2.7. Skills for handling digital information and learning

According to Paily (2013), NMLs live in a world overloaded with information, which may be accurate or inaccurate, consistent or inconsistent. The advantage of the Internet is that it submits a variety of information sources to NMLs for comparison and selection of the most viable and suitable information channels. Redecker et al. (2009) argue that NMLs show little tendency to differentiate between the correct and incorrect information, as all types of information are equal to them. This raises the danger for NMLs to fall prey to socially unacceptable sources of information, which can jeopardise institutional credibility or social norms (Warlick, 2009). However, a counter-argument to this is that the availability of multiple sources of information for comparison may induce the desire among NMLs to seek, sieve, and synthesise the new information rather than relying on a single source of information such as a teacher’s lecture, book, or television (Bower et al., 2010). Redecker et al. (2009) were of the view that no NML can process information in the right way, because of the fact that they are not trained to distinguish right from wrong. However, with training in skills to manage the overload of information sources, critical thinking about the available information channels can be promoted among learners. Pang (2009) studied the learning abilities of students via social computing applications at University of Maryland University College in the US and revealed that information management strategies based on integration of digital technologies could be a useful option for educational and training systems to teach graduate classes.

Besides the delivery of web-based information management strategies, learners should be equipped with skills to counterbalance the deficiencies of different learning styles, or to meet the challenges posed by the digital society to cognitive and emotional developments. Siemens (2006) and Redecker et al. (2009) argue for the delivery of the following additional skills to bridge the gap between natural learning styles and internet-based learning strategies in the higher educational institutions in Europe:

*Connecting with each other*: The establishment of information networks and communities of practices in order to stay updated about the latest developments in the specific domain of the knowledge or profession.

*Anchoring*: Focussing on only the desired and relevant information rather than being carried away by a deluge of it.

*Filtering*: Only extracting the most authentic, reliable and viable information from the abundance of information in order manage the acquisition of productive knowledge.

*Creating and deriving meanings*: Understanding web-based information and knowledge, and the ability to interpret and derive meanings, which can have a positive impact on the social and cognitive development of learners.

*Evaluation and authenticity*: The evaluation and authenticity of the searched or viewed information is important for assessment of the value and quality of knowledge gained from online sources.

*Altered processes of validation*: The validation of ideas and opinions of others within a specific context.

*Critical and creative thinking*: The synthesis of knowledge through creative and critical-thinking processes applied to reviewed information.

*Navigating the knowledge landscape*: To achieve the learning outcomes, the navigation between the appropriate knowledge repositories, accessing the relevant ideas, people and technologies.

Equipping learners with the aforementioned skills can ensure the counterbalance between the overflow of information from the internet sources and the intended use of digital applications for advancing knowledge, cognitive abilities and skills (Teo et al., 2016; Thompson, 2013). Redecker et al. (2009) argue that the skills and learning attitude of students are highly dependent on how training and educational institutions manage the mixture of social orientation and skills of computing applications to provide them with a better learning experience in the virtual learning environment.

In summary, some scholars have argued that learners in the digital era show highly complex traits of learning patterns which are characterised by digital literacy, learning through images, and enjoying accessibility and immediacy of information. The multimedia learning environment is found to be more suitable to fulfil their learning needs. It is argued that the connectivity of learners with each other and multi-tasking makes them learn from their peers and teachers equally, and they feel more comfortable communicating with each other to solve their issues. They give more credibility to their peers rather than their parents and teachers. This creates a fabulous opportunity for training and education institutions to consider the option of the use of social computing applications to equip them with knowledge and skills. Some of the studies reviewed in this section were geared more towards the theoretical focus on the characteristics of NMLs rather than support from empirical research, and therefore it can be posited that many of the generalisations made in this field are questionable. Qualitative studies might be useful for divulging the factors affecting the attitudes of NMLs towards the acquisition of knowledge. The discussion on the social technologies and engagement of NMLs as students with such technologies can provide a useful insight into facets of technologies which can be useful in an educational context. Care should be exercised that all students are dubbed NMLs, as there are inherent variations in the adoption and acceptability of communication technologies as learning tools.

The next section will discuss the emergence of e-Learning 2.0 concepts as a result of new learning paradigms, and their relevance in the educational context. The discussion of various social computing applications that have utility for educational and training institutions is presented as well.

## 2.3. Emergence of the e-Learning 2.0/Web 2.0 Concept in Education

Bates (2010) asserted that the change in learning paradigm from teacher-centred learning to the student-centred learning process gave birth to the concept of e-Learning 2.0. Discussing the learning characteristics of e-Learning 1.0 (the traditional application of e-learning tools), Bates (2010) argued that it is more distributive in nature, focuses on the transmissive tasks of teachers and follows the *broadcasting logic* for communicating the learning material to students. Teachers are considered the main source of knowledge and guidance to achieve the ultimate learning outcomes (Sclater, 2008; Williams et al., 2011). In contrast to e-Learning 1.0, e-Learning 2.0 emphasises the collaborative learning principle and proactive role of learners while turning the teacher into a coordinator or facilitator of learning activities. According to Schneckenberg et al.:

…learning is perceived in this perspective (e-learning 2.0) as an interlinked social process, in which students use web 2.0 tools to develop learning outcomes. They collaborate, create personal learning environments and not only reflect distributed class material but extend their learning activities to open content on the Internet.

Schneckenberg et al. (2011, p. 749)

Web 2.0 has led to, as various authors suggest, the development of social computing applications. The term ‘social computing’ is widely used to denote the social interactions of students with each other and with teachers; therefore, the term ‘social computing’ is used in this thesis. According to Redecker et al. (2010, p.19), the “user-driven applications such as blogs, podcasts, wikis, social networking websites, search engines, auction websites, games, voice over IP and peer-to-peer services.....[are] referred to as social computing”. Social computing applications exploit the internet connection to establish networking between users, and to create and disseminate user-generated content. All social computing applications give the user a central position, whether it comes to generating content (blog, wikis), expressing emotion and taste (Amazon, del.li.cious), selling/buying goods (eBay, Amazon), establishing and maintaining contacts (MySpace), seeking feedback/reputation (TripAdvisor, eBay), looking for server or storage capacity (P2P) or intelligence (business social computing) (Redecker, 2009; Pascu, 2008).

Pascu (2008) described the three main characteristics of social computing applications, which include the development and change of interaction patterns between users, collaboration among the users to accomplish a particular task, and sharing of knowledge/experiences with each other to build professionalism in certain areas of practice (e.g. teaching, medicine, reading, writing, languages). Schneckenberg et al. (2011) described the following key properties of e-Learning 2.0 supported by social computing applications:

● Learning has become ubiquitous. It is no longer restricted to the classroom but evolves in many different contexts.

● Learners increasingly take on the role of organisers.

● Learning is a lifelong process. It has many episodes, and it is not exclusively linked to educational institutions.

● Learning takes place in communities. Learners participate both in open and restricted learning communities.

● Learning is informal; it takes place at home, at the work place and during leisure time, and it is no longer centred around teachers or institutions.

Schneckenberg et al. (2011, p. 748)

From the characteristics described by Pascu (2008) and Schneckenberg et al. (2011), it is clear that one of the objectives of social computing tools is to increase the construction of knowledge either by modifying existing theories or presenting knowledge in innovative forms. Loh et al. (2016) argue that building new knowledge through collaborative activities on social computing platforms may take either the constructivist approach or constructionist approach. They differentiated both approaches as follows:

Social constructivism is present where student groups construct knowledge for one another, collaboratively creating small cultures of shared resources (e.g. using scaffold activities in wiki); and in constructionism, students construct their knowledge and understanding through a set of experiences based on solving set problems (e.g. virtual reality learning through Second Life).

(Loh et al., 2016, p. 132)

The aforementioned characteristics are used to exploit the social computing applications to support the learning process, which gave rise to the concept of e-Learning 2.0. Teaching students through the use of social computing applications is also referred to as ‘Education 2.0’ by Rosen and Nelson (2008) and ‘e-Learning 2.0’ by Redecker (2009). Rosen and Nelson (2008, p. 213) defined Education 2.0 as learning and teaching practices which apply digital tools “to transform teaching and learning by having learners, as well as teachers, participate in knowledge creation and interactively build distributed communities, or networks, of learning”. Many authors argue that social computing tools which support e-Learning 2.0 or Education 2.0 provide collective wisdom which goes beyond individual interests, and has converted traditional classrooms into adaptive, interactive and participatory living entities for the production of knowledge and content (Newland and Byles, 2014; Arquero and Romero-Frias, 2013).

McLoughlin and Lee (2011) argue that the main reason behind the choice of the e-Learning 2.0 tools for learning and professional development is the ubiquity of computing and internet-based devices, which change the learning patterns among students, especially outside the classroom. This forces educational and training institutions in both the developed and developing worlds to consider the possibility of introducing social computing applications in order to allow students to benefit from digital applications the way they do outside the classroom (Fullan and Langworthy, 2013).

Taken together, the literature reviewed in this section offers explanations about the potential of Web 2.0 applications in educational settings. In the modern era, the growth of social applications is on the rise, hastening since 2003. This is due to the increasing communication needs of young people, which opens new avenues for educational institutions. With the passage of time, the technological market has witnessed the appearance of a plethora of social computing applications; however, lately, the growth of such tools has slowed down, indicating the development of social applications has reached a mature stage. Redecker (2009) was of the view that social computing applications are not developed and optimised for the construction of knowledge, or to be used in educational settings. Careful analysis of the characteristics and communication types supported by social computing applications can reveal the potential of such applications for supporting the learning and communication needs of students. Therefore, in the following subsections, the prominent social computing tools that have relevance for the education and training of students and teachers are discussed.

## 2.4. Social Computing Applications

As this study intends to explore the potential of the main social computing applications in the educational context, it is paramount that the potential of such applications to transform individuals’ experiences and opinions into a practical form of knowledge and skills is reviewed. It would be interesting to know how social computing application projects have revolutionised learning patterns and contributed to the creation of knowledge for users. In this section, the main social computing applications and their features are described.

### 2.4.1. Online office applications

Online office applications are also referred to as ’Web desktop’ or ’Web-office’ and involve email services, various software packages including Microsoft Office and multimedia presentations (Anderson, 2007, Bartolome, 2008). These tools allow learners to communicate with each other by sharing documents, editing files and sending learning material in the form of large attachments, and giving feedback and assessing learners’ needs through email communication and presentations. Prominent examples of online office applications include Stikkit, which enables the users to send emails, save contacts, keep meeting records, and Microsoft Outlook, which enables users to communicate with each other, and share documents via email communication. Google Docs is another online office application which is useful for users to create presentations, spreadsheets and documents. Backspace is also considered a useful online office application which allows users to access information shared by other users, and receive and send updates about key events and meetings (Redecker, 2010).

The main advantage of online office tools is that they allow users to produce documents in a collaborative manner, save the history of communications for future referencing, share common information, and facilitate implementation of knowledge management systems in any organisation. Zhou et al. (2012) described a collaborative project completed using the Google Docs presentation application with 40 teachers collaborating on 500 entries. This collaboration was mediated by an online office application which helped construct new, useful knowledge for students belonging to different disciplines. The content was freely produced, reviewed and authenticated by the experts in the collaboration project, which generally helped increase the reliability of the user-generated content.

Another advantage of online office tools is that they are cheap, and facilitate distance collaboration among users across the world, individual assessment of students and assignment planning, in addition to other academic activities. Furthermore, a chat feature allows students to post questions, receive answers and make comments on posts from other users. Wagner (2007) implemented the Google Slides presentation application to conduct workshops for training primary school teachers and administrators.

The core limitations of online office applications are the lack of voice messaging and call facilities, the unavailability of the screen-casting instrument or screen-sharing facility and the lack of a signing-in system for external participants to take part in presentations and workshops. Due to these features, widespread applications of online office tools are limited in the learning and training of students and teachers (Redecker, 2009; Wagner, 2007).

### 2.4.2. Media-sharing services

Media-sharing applications are based on user-generated content, and allow users to create and display their media for self-gratification, appreciation and recognition, and to share knowledge with others in a different format. The most common example of such services include YouTube (for uploading and downloading video), Flickr (for uploading and downloading images and videos), Scribd (for documents) and SlideShare (for presentations; Redecker et al., 2009; Lewis et al., 2010).

With the advent of camera technology built into mobiles and digital cameras, the trend of posting photographs has become one of the common online activities of creating content. According to estimates presented by Pascu (2008), one million photos are updated daily onto media-sharing online services. Similarly, approximately 40 million videos – equivalent to 70,000 videos a day – are uploaded onto YouTube, and tens of billions of videos and photos are tagged on YouTube and Flickr.

Educators became interested in posting educational videos on YouTube: for example, biology lecture series and cooking classes are taught to students through YouTube videos (Huang et al., 2013; Hsu et al., 2014). TeacherTube has emerged as a powerful online teaching service, which contains more than 20,000 items in picture and video formats for students. The benefit of TeacherTube services being specific to teaching is that it enables the student to learn different complex subjects without being exposed to offensive content (Veeramanickam and Radhika, 2014; Sweet, 2014). Several studies have provided direct empirical evidence in support of customised video technology for teaching in the classroom for undergraduate students, medical students and English-as-a-second language students (Dabbagh and Kitsantas, 2012; McConnell et al., 2013; Paily, 2013). Jones and Roodt (2013) pointed to the integration of YouTube into the classroom-based instructional methods for postgraduate students at the University of Cape Town in order to obtain the real benefits such as engagement of students with the learning material, innovation and creativity. The opportunities for video-sharing technologies in learning and training systems will be discussed in section 2.6.

### 2.4.3. Social networking sites

Social networking sites can be defined as the online social spaces which are designed to foster instant collaboration, communication and sharing of user-generated content between contacts within the social networks (Cachia, 2008; Childnet International, 2008). Users obtain the benefits from using social networking sites in the form of meeting new people, sharing ideas including personal and emotional information, images, videos and audio content, and communicating through instant messages and emails. The important examples of social networking sites are Facebook, MySpace, WhatsApp and Snapchat for socialising and social networking and LinkedIn for professional networking (Margaryan et al., 2011). The main benefit of social networking platforms is that they allow the user to express their emotions, thoughts and views, appreciate comments from friends, rate items uploaded by friends and create online communities of common interest (Ruthven, 2014; Meyers et al., 2013).

Social networking platforms are recognised as the third most commonly used sites in Europe, and they were reported to contain more than 250 million profiles (Pascu, 2008). Another study showed similar results for the US, showing around 55 percent of young people have active profiles on social networking applications. The studies also reported that people in the age range of 9-17 years spend as much time on Facebook (10 hours per week) as they do watching television (Childnet International, 2008; Attwell, 2007). The Childnet International (2008) survey showed that more than 60 percent of users were found to discuss education-related issues and concepts with each other, while 50 percent of teens were found to chat about their school work.

Social networking tools, according to Davies and Cranston (2008), are mostly used for the purpose of making friends, obtaining recognition from peers, staying in touch with friends, keeping up-to-date about social changes, and engaging in debates on political affairs. Bennett and Maton (2010) argued that engagement with peers and sharing ideas and self-expression are the main motives of users joining social networking platforms. Popovici and Mironov (2015) reported the usage of social networking sites is not only limited to developing contacts, but it is also extended to accessing educational material. They further concluded that the creation of educational content and sharing professional experiences are related to the curiosity about establishing an identity within an online community of practice.

Many authors have supported the application of social networking platforms for creating additional opportunities for young people to learn from each other and their surroundings to foster establishment of responsible citizenship and learning communities and stimulate the urge for self-directed learning (Kind and Evans, 2015; Kang et al., 2011). However, Chen and Bryer (2012) emphasised that the independence and participation of young instructors in social networking platforms under controlled conditions (university-managed social media platforms, secured portals, quick feedback on students’ assessments) in the US can lead to better outcomes for learning, exploration and discovery of their own selves and about social norms. The authors revealed that a learning environment supported by social computing applications was able to stimulate increased engagement, enriched discussions and broad connections.

Bossu and Tynan (2011) expanded on controlled implementation of social networking platforms by highlighting the involvement of education and training institutions to determine the needs and creative potential of learners. Awareness of the benefits of social networking sites is critically important for achieving the desired educational benefits for learners through integration of social networking platforms into instructional technologies (Clark et al., 2009). Training and educational institutions can benefit from the real potential of social networking platforms through development of online spaces for different learning communities so that the exchange of ideas, achievements and self-expression can be mediated (Allen et al., 2012). In addition, learning in a digital environment protected by copyright and data protection policies can further enhance the use of social networking platforms for improving learning and skills development (Bossu and Tynan, 2011).

Apart from creating communities of practice sharing common interests in a subject, educational and training institutions can improve the responsible use of such media by sending clear-cut messages to users that the authorities are aware of the online spaces enjoyed by learners (Rapetti and Cantoni, 2010). However, these changes need support from empirical research to support the arguments above. Cultural and social factors might act either as facilitators or barriers in the way of implementation of social networking platforms in the knowledge-management systems controlled by educational and training institutions (Clark et al., 2009).

## 2.5. Evolution of Blogs: Overview of Blogs

Blogs first appeared in late 1999 (Descy, 2004; Blood, 2004) and they are among the tools of Web 2.0, which include wikis, podcasts, and social networks (Beldarrain, 2006). The word *blogs* is the shortened form of *weblogs,* which was constructed from two words: *web* and *logs* (Huang et al., 2011)**.** It originally described a *web* page that *logs*hyperlinks toweb sites that interest the surfer (Huang et al., 2013). In December 1997, Jorn Barger joined the two words together to create the new word *weblogs,* which later became blogs (Descy, 2004). The content and the purpose of the blog depend on the interests and the purpose of its author. Blogs have many forms – journals or diaries, brief articles, an article with pictures, updates of a project, or a literary work (Descy, 2004), but they are ultimately communication tools.

Past research has revealed attempts to define blogs. Eastment (2005) defines them briefly as online diaries. She adds that they are logs of ideas, reflections, and events in the life of their author. They are a space for anyone to write anything, as the reader is given the chance to comment on what s/he reads. Other researchers describe them as web pages that are frequently modified (Qian and Scott, 2007). Downes (2004) points out that blogs in their purest form mean 'personal publishing' (p. 18). Finally, the important information to add to these definitions is that blogs belong to the environment of computer-mediated communication (CMC) and it is argued that they are among its most effective tools in allowing peer-to-peer communication without word-count restrictions in messages and posts (Godwin-Jones, 2006), although there has only been limited research on this and some of that was inconclusive (Kim, 2008), especially when related to an educational context. In fact, blogs are growing increasingly. There were more than 60 million blogs all over the world in May 2005 (Huang et al, 2005). This significant number has undoubtedly doubled by now. Educators should react to the situation positively and open their doors to the blogging wave. Policy-makers and educators should search for new possibilities within that can supply students with a good education. Halic et al. (2010) conducted research on the role of blogs in increasing reflective practices, and found that blogs have potential value in increasing collaboration, reflection and a sense of belonging to a group. Lenhart and Fox (2006) reported that blogs are seen as an appealing platform among a younger demographic. They further found that more than half (54 percent) of American bloggers were under 30 years of age, compared to just a quarter of that same age group being internet users. The authors further argued that the main topic for bloggers was to express their own experiences and share stories.

More recent analysis of blogging statistics comes from Crestodina (2018), This provides more background to the phenomenon. Much effort goes into the writing of blog posts and Crestodina (2018) reports that the average length of time taken has risen 44 percent from 2.5 hours in 2014 to 3.5 hours per post. This indicates the amount of thought that goes into each post, suggesting that there is a certain amount of research and reflection involved. Original research has significantly more impact on results (Crestodina, 2018). It implies that blogs are being accepted more as professional output, rather than meanderings of individuals, and that they are gaining recognition as a valid source of information.

Taken together, the foregoing data indicates that blogs can be an effective communication platform, which is used for some educational disciplines; however, the studies cited in this section emphasised the design and implementation of blogs in an institutionally controlled environment rather than in the public domains in order to obtain the real benefits out of it. Based on purpose and the type of contents communicated on blogging platforms, there are different blog formats in educational settings, which are described in the subsequent subsection.

### 2.5.1. Types of blogs in Education

According to Campbell’s (2003) classification, there are three specific types of edublogs in education and training systems.

#### 2.5.1.1. Tutor blog

Atutor blog is administered by the teacher. The content of the blog might be limited to the syllabus, provide information on the course, materials and assignments, and include teacher feedback. However, the teacher may write about his or her personal life. S/he may invite students to discuss the local culture or the target culture and language. In this kind of edublog, sometimes students are allowed to comment on the teacher’s posts but they cannot blog their own posts. Some teachers also provide a chatroom where students can ask questions. Hernandez (2018) argues that tutor blogs interweave language and culture so that language teaching can be taught in context

#### 2.5.1.2. Class blog

A class blog is the result of a cooperative effort of a whole class. Teachers and learners participate alike. This type of blog can be manipulated in many ways. For example, it can be an extension of classroom discussion in an extra-curricular activity. In class blogs, learners have more freedom of participation than in tutor blogs. There is more freedom for learners than in the tutor blog and they are guided more by teachers than in the learner blog (Campbell, 2003).

#### 2.5.1.3. Learner blog

These blogs are administered by learners themselves, whether as individuals or as small collaborative groups. They can be useful in reading and writing classes. Learners can create their own blogs and publish their opinions on a reading assignment. Furthermore, learner blogs can be a good place for practising writing or even for self-expression. Stanley (2005) asserted that this kind of blog requires more effort and time on the part of the teacher, who should follow up learners’ blogs. However, Stanley also claimed that the learner blog is more beneficial than the two other types of edublogs (Stanley, 2005). Learner blogs tend to be areas where participants share experiences and can sometimes read like diaries or journals (Martinez and Stanger, 2013).

As blog usage has increased and developed, others have added to Campbell’s original classifications (2003). Three years after Campbell, Richardson (2006) categorised edublogs as follows: class portals; online filing cabinet; e-portfolio; collaborative space; knowledge management; and school website. A year later, Tomé (2007) retained teacher blog, student blog and class blog in their categorisation, but added blogs as educational websites along with recognition of audio (audio-blogs) and video (vlogs) contributions. Different criteria continue to be used as edublog development and technology advances, enabling new ways of communicating and maintaining interest. The many factors that make blogs interesting include the social presence they give learners (Anderson, 2004), and the opportunity to work independently and autonomously (Wheeler, 2009). Blogs act as a medium for critical information-sharing (Macduff, 2009) and for reflection upon experiences (Xie and Sharma, 2005). The opportunities and benefits of the blogs in the educational context are detailed in section 2.6.

Consideration of the design characteristics of blogs is important, as this study aimed to develop the educational blog in order to assess its potential to improve the learning and training experiences of student teachers. The literature reviewed in the subsequent section helped to create an understanding of the design features from the user’s perspective.

### 2.5.2. Design characteristics of blogs

The underlying technology behind blogging makes it a mainstream form of asynchronous communication over the Internet. Davi, Frydenberg and Gulati (2007) explained the underlying technology that makes blogs an improvement in CMC. In blogs, posts appear in reverse chronological order; newer material is shown first. Students can create their own blogs, which they can control, and they own the content. This makes students 'part of the blogging phenomenon that is increasing in the “real world”’ (Davi et al, 2007, p. 2). The most important feature of blogging technology is that it motivates students to become engaged with out-of-class discussions on the web. Anyone can set up, manage, and update a blog freely and easily using one of the providers available on the web such as *Blogger.com*, *LiveJournal.com*, and *WordPress.com*. This availability also allows bloggers to become familiar with blogging without needing any additional support. In addition, readers of blogs can check in on their favourite blogs occasionally by visiting the blog website to see if there is any new material published there. Davi et al. (2007) explained how blogs are designed to make the follow-up easy for the reader:

Blogs make use of a 'publish-subscribe' model, in which the author publishes content, and subscribers use a program called an aggregator, which checks the blog periodically and then notifies the subscriber that new content has been posted. This method of really simple syndication (RSS) is possible because the content of the blog is represented in a standard XML (extensible mark-up language) format enabling aggregators to check and manage any new content. Those who manage several class blogs, or those who subscribe to many different blogs, will find the ability to subscribe to a blog and let an aggregator do all of the management work, to be valuable.

(Davi, et al., 2007, p.13)

From the above quote, it is clear that blogs enable users to post their content for the target audience who are subscribers to the blogging platform. The aggregator, which is embedded in the architecture of the blogging platform, acts as a middle person and manager to sift and manage the communication between the users. This feature comes in handy to manage the chronological order of posts.

Lui et al (2006) listed the basic contents of a blog interface. The first page of a blog usually contains:

● A number of the latest entries appearing in reverse chronological order

● A list of the latest responses of the blog readers

● A search box to look for certain materials on the blog

● A list of links to an archive, categorised by months or by entries.

After clicking on a particular entry, a single-entry view appears which contains all the comments given by readers of that entry, and a form that allows the current reader to leave another comment (Chung et al., 2007). Furthermore, the reader can easily navigate weblog entries by category or by date.

Chung et al (2007) explain another aspect of the technology called trackback which is useful in informing users about the entries posted in the past, and also gives updates about the entries posted by other bloggers through the universal locator (Chung et al., 2006). This measurement of posts tends to quantify the information that is shared with others and may serve to help people find ways of improving (Rettberg, 2014). Tracking can also provide a sense of pride in what has been done (Ruckenstein, 2014), namely the information that has been disseminated.

The texts, pictures, links to other sites, audio and video clips that can be generated and posted in blogs (Wassell and Crouch, 2008; Merchant, 2009) make the experience more interesting for learners and can enhance their learning as it captures their interest. As blog posts are stored, users can go back and read them at their own leisure, depending on the information they wish to access. Furthermore, as these postings are from real people, they provide an immediate sense of being involved with others. However, Rettberg (2014) suggested that bloggers may filter the information they wish others to see; in other words, they may not always relate experiences as accurately as they might due to their own biased perception, or they select which particular knowledge they wish to share. The choices made when selecting which information to share are made in real time; therefore, they may show progression as they are updated (Rettberg, 2014).

Being able to provide an ongoing narrative encourages personal responsibility and ownership among bloggers (Godwin-Jones, 2003); that is not evident in other contexts, where learners are restricted in commenting and sharing personal experiences. Godwin-Jones (2003) was one of a number of educators who saw the potential of blogs in foreign-language teaching, and this potential continued to be promoted as their usefulness as a resource continued to develop (Damascelli, 2017; Sundqvist and Sylven, 2016). Technology facilitates the use of blogs as ways of communicating with learners from other cultures and languages (Hernandez, 2018), thereby making them especially useful in foreign language teaching. The feature of social participation associated with blogs specifically, and Web 2.0 spaces in general, is considered important by Merchant (2009), as it allows users to rate, rank and comment on the content posted by subscribers.

From the discussion in the previous paragraphs, it is clear that blogs have useful design features such as posting short to long messages to communicate with peers. In addition, blogging platforms are useful in supporting different forms of communication, such as audio and video clips, which can provide users with an insight into the dynamic nature of events and processes. The essays and articles written by users on blogs can enhance their functionality as an education platform, as it helps teachers to assess the quality of written material and students’ understanding of a specific topic. Reading the essays and articles posted on blogs can also increase comprehension skills. Hence, blogs can afford a variety of benefits to students/users, ranging from providing students with multiple sources of information and allowing teachers to assess students’ learning progress, to improving communication between teachers and students. As this study intends to harvest the benefits and potentials of blogging to achieve the training objectives for student teachers at the selected university in Saudi Arabia, it is vital to review the literature regarding affordance of blogging in education, which is presented in the next section.

## 2.6. Affordances of Blogging in Education

Gibson (2014) defined the term ‘affordances’ as follows:

…affordances of the environment are what it offers to animal, what it provides or furnishes, either for good or ill. I mean by it something that refers to both the environment and the animal in a way that no existing term does. It implies the complementarity of the animal and the environment.

(Gibson, 2014, p127)

Hence, Deng and Yuen (2011) posited that the affordances of blogging represent the possibilities and opportunities offered by the blogging environment to students, and vice versa, for developing the knowledge and skills related to specific educational disciplines. The affordances of blogging in the educational setting have been reviewed in detail in the next subsections. The discussion is focused on the construction of knowledge, reflection, social interactions, and collaborations in the pedagogical domain

### 2.6.1. Affordances for social constructivism

Vygotsky presented the theory of social constructivism, which introduced the concept of knowledge development through social interaction (Vygotsky, 1962, cited in Wang and Hsu, 2008). Lee et al. (2012) conducted a study involving American undergraduate students who used blogs by applying concepts from social constructivism, finding that blogs enhanced the interactions of learners from two perspectives: through interacting with learners to learn, and collaborating with teachers/trainers to accomplish tasks of higher significance for achieving learning outcomes. The method employed by Lee et al. (2012) to collect the data was qualitative interviews. Similarly, Kang et al. (2011) explored the premise of blogs as a networking platform for graduate students in Korea using the qualitative research method, discovering that blogs provide a multi-layered and multi-dimensional interactivity between students and teachers. The authors further concluded that, although collaboration and social interactions overlap with each other, the interactions with the knowledge community on blogs and attracting the attention of peers is essential before embarking on a collaboration phase.

Kosnik et al. (2018) used social constructivism as a framework in order to assess the impact of blogs and some other social media tools (Facebook, Twitter) in a large-scale study involving 28 literacy/English teacher educators from four countries: the US, England, Canada and Australia. They presented findings from six student teachers using the constructivist learning approach. They reported that student teachers interacted with peers and teachers in the online communities to develop their learning and skills. They shared their experiences with each other by creating online communities. Drawing on their strengths, they collaborated with other teachers using blogs and Facebook. However, they pointed out that realisation of development of knowledge-construction was dependent on the richness of experiences, presence of a strong class community, and the flexibility and fluidity of the blogging platform. The outcomes reported by Kosnik et al. (2018) highlighted the pivotal role of social media in supporting the development of new knowledge among student teachers in developed countries. However, due to the methods used and variations in socio-cultural backgrounds, these outcomes cannot be generalised to student teachers in Saudi Arabia. Social constructivism cannot be realised without the incorporation of effective social interactions, which means that blogs should afford the social interaction among users, an issue which is discussed in the next section.

### 2.6.2. Affordances for the social interaction

Social interaction is the prominent feature of blogs, and it can be used by educational institutions in a productive manner. Byington (2011) argued that social interaction between learners on blogs is the precursor to the establishment of a community of practice. The author posits that face-to-face communication makes the exchange of knowledge between students and teachers cumbersome due to the many challenges posed by the digital era, such as time, resources and learner availability. The social interaction of learners with other learners takes place when they face issues, which motivates them to ask questions, read posts, share posts, open the links posted by others, and show they like to posts. All these factors lead to strengthening the interaction of learners with each other, which then mature into collaborations and cooperation to help resolve the major issues in learning. Therefore, exchanging ideas and giving feedback are considered the cornerstone for social interactions as mediated by blogs (Meinecke et al., 2013; Robertson, 2010). Kim (2008) also showed that seeking help from peers, analysing conflicting point of views, justifying arguments, cross-referencing and seeking external sources to develop a higher level of understanding are the outcomes of social interactions among students and teachers in blogs.

Several studies have provided empirical evidence in support of the positive relationship between the proportions of posts and social support from other readers on the weblogs. For example, Rains and Keating (2011) analysed 121 bloggers to examine their social interaction and its relationship with the supportive communication on health-related blogs. They found that the proportions of posts posted by readers significantly correlated with the perceived social support from other blog readers in the form of liking posts and commenting on them. This provided a clear indication that social interaction is highly important for achieving the learning outcomes of the target audience, or that the culture of ‘liking’ posts is prevalent.

Top et al. (2010) conducted a study on the use of blogging in pre-service teacher education courses, using a survey instrument, and found that blogging has the potential to promote information sharing through the instant communication between teachers and students. The blogs also promoted the sense of being part of a learning community, which enhanced the satisfaction of student teachers with the learning material. The interesting outcome of the study was that students had less aptitude to benefit fully from instructional blogs. This necessitates the need to investigate the factors preventing students from being engaged with the communities of practice on instructional blogs.

Similar findings were reported by Beldarrain (2007), who showed that blogs, along with other emerging instructional technologies, increased the interaction between students and teachers. In the socially interactive environment of blogs, students were able to harness the opportunity to pose questions, receive answers and critically analyse the posts from their peers on distance education courses. Top et al. (2012) performed a quantitative study to find the predictors of perceived learning through blogs among students. They found that sense of community was the best predictor of perceived learning among students. This provided direct evidence that blogs are socially interactive virtual spaces that promote participation from people with same or similar interests, thereby facilitating the exchange of ideas and experiences in the virtually social environment.

Sun and Chang (2012) carried out an exploratory study involving six Masters level students studying Teaching English to Speakers of Other Languages (TESOL) in Taiwan, and revealed that student motivation to develop knowledge, writing abilities and reflection practices were increased by increasing the number of users participating in the discussion on blogs, which suggests that effectiveness of a blog as a vehicle of learning can be enhanced through participating with members of a community of practice. According to Etienne and Wenger-Trayner (2015), the community of practice refers to “the group of people who share a concern or a passion for something they do and learn how to do it better as they interact regularly” (p. 1). Lee and Bonk (2016) revealed while examining the social network of learners’ relationships and online interactions in a postgraduate course using weblogs and reflective journals that, “the social network patterns and values are measured by peer relationships and were noticeably changed at the end of the semester, when compared to that at the beginning” (p. 35).

Taken together, social interaction is the dynamic feature of blogging and beneficial for the sharing of knowledge, experiences and opinions. Blogs might be used as a communication tool for strengthening the line of communication between the novice and experts in a specific discipline of knowledge, which might allow the exchange of useful information between groups of people with different levels of experience in the community of practice. However, some authors have expressed concerns regarding the exploitation of social interactions for building the communities of practice, which should be overcome in order to make blogs into an effective instructional model.

### 2.6.3. Affordances for collaborative learning

The collaboration of individuals with each other to strengthen their knowledge and develop new meanings and skills for classroom-based practice and beyond the classroom-learning environment is one of important benefits offered to learners by blogging tools (Wheeler, 2010; Nawaz, 2013). While dissecting the advantages and affordances of blogging for learners from the perspective of collaborative learning, Minocha et al. (2009) reviewed the literature on the educational applications of social software, and reached the following conclusion:

…social software seems to match well with modern thinking about the educational practices. In particular, it promises learners new opportunities to be independent in their studies and research. Social software tools encourage a wider range of expressive capability. They facilitate more collaborative ways of working and they furnish a setting for learners’ achievements to attract an authentic audience.

(Minocha et al., 2009, p. 354)

Several scholars posit that the interactive design of blogs is helpful in facilitating collaboration among students and teachers to produce productive knowledge, which can be useful for both academic organisations and social developments in a wider context (Zuniga, 2009; Wang, 2009). The exchange of views, guidance from the teachers to students and flow of knowledge among peers leads to an active learning which, in the view of Hemmi et al. (2009), is not possible without collaboration. The active learning communities on blogs provide a healthy learning environment to students and teachers, which results in the development of a constructivist learning environment, as dubbed by Noel (2015). Minocha (2013) recognised that the active learning, reflective practice and learning journals supported by blogs are useful instruments for the higher education system for improving the academic achievements of students.

Minocha et al. (2009) further concluded that blogs have the potential to create collaboration between teachers and students in the domains of higher and further education, after analysing 26 case studies from UK-based educational and training institutions and systems. The outcomes of the study reflected that collaborative processes on the blogs can include the teacher providing feedback on assignments, answering study/research questions, tracking the students’ progress and delivering lectures in the highly interactive environment of customised blogs. Students taking part in such weblog-mediated collaborative activities might enjoy benefits including the synthesis of new knowledge, innovation in thought, and new collaboration skills to interact with professionals in a real-life environment. Dabbagh and Kitsantas (2012) argued that the learning experience of students could be developed via face-to-face interactions and collaborations, but such collaborations could be undermined by spatial and temporal constraints. Nevertheless, the learning environment created through blogs is free of such constraints, thereby facilitating the achievement of learning outcomes through one-to-one or one-to-many interaction patterns on the blogging platform (Chu et al., 2012).

However, many authors have emphasised that the streamlined weblog-mediated collaboration with well-focused objectives is important in terms of the productivity it yields through collaboration among the learning communities on blogs (Wheeler, 2010; Goh et al., 2010; Churchill, 2009). Many studies reported that collaborative projects for learning were successful in terms of increasing teamwork and achievement of goals in the group learning within organisationally controlled environments (Nawaz, 2013; Goh et al., 2010). For example, universities involved in teaching students learning and skills achieved higher success rates using blogs controlled by the organisation itself compared to publicly available blogs (Phillip and Nicholls, 2009).

Another challenge identified by Minocha (2009b) is the absence of clear-cut instructions and policies for setting up the collaborative projects on blogs at educational and training institutions, which hampers the ability of educators to design effective collaborations such as giving and assessing the incorporation of feedback in assignments and the construction of group reflective blogs. Therefore, it can be argued that the regulation and control of learning environments, coupled with clarification of guidelines and policies, are highly important when using blogs as a collaborative tool for development of learning and professional development at educational and training institutions and systems.

Langhorst (2006) developed and implemented three blogs – Daisy the Duck, Duck Diaries, and Trout Diaries – at US-based primary schools for teaching the students historical novels and awareness of the language of literature. They allowed collaboration between different groups from the community including students, authors of novels, parents and story-tellers. The collaboration of students with real actors in society involved in writing poems and novels increased the motivation level of students to learn about literature. This shows that blogging has great potential for increasing students’ motivation, participation in discussions and overall improvement in the quality of knowledge through the collaborative element in the blogs.

In summary, blogs are effective instruments for creating collaborative projects in higher education due to their capability to support peer-to-peer communication with the dynamic functionalities of browsing, posting links, threads, and exchanges of information to resolve issues based on experience. Studies reviewed in this section were mostly qualitative in nature, and explored the premise of weblogs in establishing the correlation. However, they could not measure the effect of such correlation on the efficiency of the collaborative projects. Most studies were limited to undergraduate students in English language classes; however, there was limited data regarding the efficiency of blog-supported collaboration in the student-teacher training system in developing countries such as Saudi Arabia. The current study intends to fill in this research gap by developing and evaluating the effectiveness of educational blogs on the learning and skills development of student teachers in Saudi Arabia.

### 2.6.4. Affordances for reflection and cognition

Blogging offers a unique opportunity in the area of reflection and cognition. Many scholars have described the utility of blogging in terms of supporting reflection and self-expression, such as publishing thoughts, promoting ‘out-of-the-box’ thinking, expressing feelings, and documenting experiences (Deng and Yuen, 2011; Robertson, 2011). The blogs afford opportunities for learners to engage in projection of the social and emotional aspects of their lives, which leads to learners’ development of cognitive abilities (Lee et al., 2012; Chu et al., 2012). Garrity et al. (2014) argued that when the thoughts and feelings are correlated with experiences, it results in streamlined thinking and subsequent innovation of thought in the light of other people’s experiences.

Brescia and Miller (2006) were of the view that blogs can be emotional in nature, which is evident from the personal diaries. The writing of emotional blogs involves reflection on emotional stress, and drives the self-learning process about the management of psychological stress (Nardi et al., 2004). In addition, blogs afford the multi-modal projection of thoughts, experiences and emotions: for example, learners can share content in the form of pictures, audio clips, and video clips with other users in the blogging space (Hall, 2018; Merchant, 2009).

Deng and Yuen (2011) emphasised the importance of interaction with a real audience, discussing and publishing work with experts in the field to create a constructive learning environment. This process not only promotes the critical analysis of the students’ learning activities, but also stimulates self-expression and self-reflection. Several studies have highlighted the contribution of blogging to the development of self-reflection. Yang (2009) investigated the effect of blogs on critical reflection and community of practice of 43 teachers in two different teacher-education programmes. After analysing 1000 messages, they found that student teachers showed significant improvement in the critical analysis of teaching theories, critical reflections on comments and thoughts shared by student teachers with each other on blogs. They further concluded that student teachers found the blogs useful for enhancing their critical reflection and community of practice.

Similarly, Farrand et al. (2010) investigated the impact of reflective blogs on cognitive behaviour and the self-reflection and self-practice of student teachers using group methodology involving the qualitative approach. They demonstrated that reflective blogs were effective in developing the self-practice, self-reflection and cognitive behaviour of the student teachers during training programmes, thereby suggesting the affordance of reflective blogs in increasing the performance of training programmes. Dabbagh et al. (2012) showed that blogging was useful for students to develop their cognitive thinking about the content of courses, allowed the growth of learning communities and encouraged critical reflection among students in their personal learning environments.

Robertson (2011) described the role of reflective blogs in self-directed learning, and outcomes of the study showed that reflective blogs were used by students to take feedback from peers on assignments. In addition, the motivation and encouragement to comment and praise and critically analyse posts by other users were found to be prominent among students, showing the implication of blogs in the development of cognitive and reflective abilities among students. Novakovich (2016) reached a similar conclusion on revealing the impact of reflective blogs on students’ writing. The author found a significant relationship between the improvement of critical comments and self-reflective practice and the use of blogging software. They concluded that blogging can be used as a tool to foster critical thinking and the development of cognitive behaviour and reflection among university-level students.

Blogs are a critical source of enhancing the integration of deeper learning and the integrated process of knowledge synthesis, which are part of the learner’s reflective practices (Dos and Demir, 2013; Yang, 2009; Wheeler, 2009). Kori et al. (2014) conducted a literature review in the context of the technology-enhanced learning environment. They found that most of the studies provided argumentative discussion on the link between critical reflection and use of technology, including blogs, while some studies provided concrete evidence to show the positive impact of blogging practice and other learning technologies on reflective practices. They stressed the need to conduct qualitative and quantitative studies in order to establish the correlation of blogging with students’ reflections in different socio-cultural contexts.

Taken together, the abovementioned data show the positive impact of blogging on critical reflection, thinking processes, and learning abilities of the learners in educational and training institutions and systems. The studies demonstrated the role of blogs in enhancing self-development through self-reflection and improved cognitive and psychological processes for attaining higher levels of achievement. Hence, there is compelling empirical evidence that establishes the association of blogging with reflection, and there is a need for further studies to support the relationship between reflection and blogs from intercultural perspectives.

### 2.6.5. Affordances for constructivist learning development

Paily (2013) argues that blogs afford the support for development of constructivist learning activities, especially in the areas of social interaction and cognitive development. According to constructivist learning theories, the learners construct their own understanding, meanings and effective knowledge through engagement with the learning material. They draw on previous experiences, building on the thoughts actively collected from different learning materials (Cuhadar and Kuzu, 2010). Noel (2015) supported the role of blogs in improving constructivist thinking involving social constructivism and cognitive constructivism. Blogs are reported to increase the understanding of learning material through supporting the learning at the intellectual level, which enables learners to look at different aspects of meanings, interpretation of the topics from their own experiential perspectives, and synthesis of novelties and innovations at the conceptual level (Kala et al., 2010).

These cognitive and intellectual developments mediated for learners by blogs is in accordance with the concept of cognitive constructivism (Tang and Lam, 2014), which stresses the cognitive developments of individuals through interaction and engagement with the learning content rather than passive reception of learning material. For example, when the learner receives comments from other blog users, he/she analyses the comments, critically reflects on them and then responds to them (Kang et al., 2011). Thus, blogs actively make the learners engage with the learning material, which leads to improved performance of students in terms of knowledge acquisition and implementation to solve their problems in real life.

Noel (2015) argued that blogs influence the cognitive development of learners through a variety of ways; however, motivation was one of the most highly researched concepts in the context of the impact of blogging on constructivist learning. Several scholars have pointed to the significance of motivation in enhancing constructivist learning. Comas-Quin et al. (2009) found that student motivation plays a fundamental role in learning from the course content, engagement with teachers, and interaction with students on blogs, which provided better control and flexibility, enabling students to handle the pace of learning. Furthermore, weblogs are electronic journals organised according to student needs, compatible to their life-styles in the digital era, and allowing them to make quick decisions in terms of selection of learning material, facilitating the communication to peers and teachers in multiple ways, and offering them a considerable degree of privacy (Huang et al., 2009; Sawmiller, 2010).

Furthermore, blogs offer learners the advantage of social recognition and appreciation for learners, which motivates them to generate high-quality learning material for the other users dispersed all around the globe (Halic et al., 2010). Heo and Lee (2013) described blogs and social networking sites as activity systems which motivate learners to acquire knowledge, reflect on the concepts, and establish practice-based online communities. Hence, the construction of knowledge and development of the learning process are strengthened through the application of blogging in the higher education system. Sawmiller (2010) concluded with similar outcomes by showing that blogging serves as a vehicle to provide “click-to-push” results of student performance, to show the quality of the students’ work, and to provide a voice for the “silent students”. These factors result in constructive activities on blogs and are motivations for student to learn through blogs. Similar findings were reported by various studies that showed the impact of blogs on reading (Huang et al., 2008), speaking (Shih, 2010), and writing (Amir et al., 2011).

Taken together, there is plenty of empirical evidence regarding the contribution of blogging activities towards the development of learning and learners’ cognitive abilities. Blogging can be utilised by the educational system to cater to the cognitive and learning needs of students. The commitment to the use of technology in a constructive way is the first step to harnessing the real benefits of social computing applications. Cordoba and Piki (2012) warned that blind implementation of social computing could lead to side-effects on learning and the cognitive development of learners. Stockwell (2013) stressed the importance of a survey of learners’ needs prior to planning and implementation of blogs in educational and training systems.

### 2.6.6. Affordances for pedagogical practices

Blogging has proved to be successful as a pedagogical tool for improving the performance of teachers and students in the classroom (Nambiar and Thang, 2016). Dittmar and McCracken (2012) point out that studies investigating the impact of blogging on pedagogical practices of teachers are still limited, which warrants further investigation into the success factors in relation to the application of blogs as teaching and learning tools for teachers and students. Murugaiah et al. (2010) suggested that schools and universities are apt in adapting the blogs to fulfil their educational and training needs; however, the studies reporting on the success of blogging projects in educational and training institutions do not, unfortunately, keep up with the pace of the adoption of blogs.

Pedagogical practices are improved through experiences, learning from peers and a continuous training process. Blogs serve as a virtual training spaces for pre-service and early career teachers, as they allow them to be in touch with people in the teaching field (Joshi and Chug, 2009; Hourigan and Murray, 2010). The communication of teachers with each other is usually facilitated by face-to-face interaction, which is a traditional way of learning through physical collaborations. The issues pertaining to the delivery of content, assessments, feedback and management of students in the classroom fall within the domain of pedagogical practices, which can be discussed and solved in the dialogue spaces provided by blogs to teachers, regardless of the stages of their teaching careers (Jimoyiannis et al., 2013; Dema and Moeller, 2012). Ovarec (2002) argued that “weblog development can empower students to become more analytical and critical; through actively responding to Internet materials, students can define their positions in the context of others’ writings as well as outline their own perspectives on particular issues” (p. 618).

Al-Qallaf and Al-Mutairi (2016) analysed the effects of blogging on professional practices of teachers engaged in teaching English as a foreign language (TEFL), and reported that blogs can serve as vehicles to provide quality information and knowledge-building practices, which ultimately improves the practices of teachers. The opportunities for social interaction and critical reflection enable teachers to correct their mistakes in instructional design and learn new strategies to provide better learning experiences to students beyond the classroom.

In addition, while discussing the advantages of blogging for student teachers, Zandi et al. (2014) revealed that student teachers in the Iranian higher education sector were motivated to learn and develop their in-depth understanding of the topics discussed in class, when teachers posted the hyperlinks of internet resources related to the subjects under discussion. These outcomes clearly reflect that blogging can be advantageous to teachers as a virtual tool for improving pedagogical practices. Furthermore, students can download resources, critique the learning material and contextualise the learning resources to the problems in hand (Prestridge, 2014). The feedback from students on teachers’ abilities to resolve educational issues results in self-evaluation which might be the source of amending the weaknesses in teaching strategies employed by teachers of English as a second language (Ozkan, 2011; Sun, 2010). Farmer et al. (2008) explored the premise of the weblog for liberal arts students using case study research design. They found that the process of self-evaluation, writing in a careful way, and provision of authentic information to students were key components of the knowledge-building process for students supported by weblogs.

Richardson (2006) reported the effect of blogging on learning and acquisition of knowledge for both teachers and students, suggesting that blogs give the “legitimate chances to participate” to both teachers and students for fostering the sharing of knowledge and clarification of complex ideas and issues. According to outcomes reported by Williams and Jacobs (2004), 55 percent of students surveyed reported that blogs helped them to clarify concepts and ideas that were discussed in the classroom. Also, 77 percent of the students in the study were of the view that blogs facilitate “the level of meaningful intellectual exchange between students” (p.8). The authors concluded that blogs can be beneficial tools for cementing student-student and teacher-student interactions, which can lead to learning support for students and the promotion of student autonomy simultaneously.

Joshi and Chugh (2009) argued that pedagogical practices should move away from the procedural and traditional style of teaching, which is only possible when innovative digital technologies such as blogs are used. They concluded that blogs can replace the existing learning strategies such as memorisation of content and following the professional standards including teaching guides as an ultimate source focused on self-evaluation, self-reflection and analytical methods for teaching and learning.

From the earlier discussion, it is evident that a plethora of studies are available to show the contributions of blogs in increasing the effectiveness of pedagogical practices. The studies reviewed in this section were both qualitative and quantitative. However, there was a scarcity of studies using the mixed method approach to gain in-depth understanding of the factors leading to growing role of blogs in the improvement of pedagogical practices. Only a few studies used the pre-and post-evaluation model to assess the impact of blogs on teaching practices. Research involving the pre-and post-implementation of blogs could reveal the effects of blogs on various dimensions of teaching practices, such as competency and confidence of teachers to deliver curricular content to students in the classroom or online learning environment. This warrants further research to bridge the gap in the existing literature concerning the use of pre-and-post-implementation evaluation models for assessing the impact of blogs on confidence and competence of student teachers. This study contributes to filling this knowledge gap in the context of the Saudi higher education system by developing and evaluating an educational blog for student teachers in the selected university.

After reviewing the literature related to the affordances of blogs in the areas of development of pedagogical practices, constructivist learning, collaboration, reflection and cognitive development, it is also important to highlight the limitations of blogs. This is critical, as it can inform researchers and academics as to how to avoid issues while designing and implementing blogs in the educational environment. The next section reviews literature regarding the limitations of blogs in education.

## 2.7. Limitations of Blogs in Education

Although it was discussed extensively in section 2.6 that there are amount of benefits of using blogs in education, and that they offer promising opportunities for learners and educational/training institutions as vehicles of learning, nevertheless, they potentially carry some negative influences on constructive knowledge-building and professional development in communities of practice, especially due to side-effects resulting from the unorganised and unsupervised collaboration and intellectual engagement.

Carrington and Robinson (2009) reported that blogs are useful in offering opportunities in the area of cognitive development of learners. However, they do not necessarily help users to establish the conceptual links or cognitive associations between the concepts discussed in blogs, which is observed in two important domains of professional development: engagement with other users, and self-reflection/self-evaluation (Biggs, 1996). Robertson (2011) reported that poor performance of learners in intellectual engagement arises from the plethora of material posted by users from a variety of experiential and educational backgrounds. The reading of material and developing solid and coherent concepts from the posts emanating from different sources on blogs creates chaos rather than improving understanding, in the case of an unsupervised learning process (McGill and Hobbs, 2008). Therefore, Carrington and Robinson (2009) argued that it is important for students and teachers to manage the workload based on the individuals’ learning capabilities in order to motivate students to become engaged with the learning material posted on blogs.

The process of creating meaningful engagement of learners with the learning material on blogs necessitates pinpointing the level of difficulty of the learning material and the time required for students to assimilate the posted concepts thoroughly (Pi et al., 2010). Noel (2015) noted that poor quality learning occurs on blogs, where learners are overwhelmed by plenty of material and are expected to contribute to the learning process. As a result of this haste, some students read quickly and try to post short answers; this unsuitable approach is does not do justice to the posted material and results in poor engagement of some learners with the key concepts and learning outcomes expected by the educators (Warlick, 2009). For instance, Biggs (1997) revealed that short answers from students significantly affected critical thinking, which was essential for developing the learning of meaning and constructive engagement with complicated ideas. The authors further noted that longer texts enable the student to think more about the subject matter before writing, which improves the reflection and critical analytical abilities of learners (Barton and Ryan, 2014).

Some studies have contributed to enhancing understanding of the negative effects of blogs on the conceptual and cognitive development of learners (Noel, 2015; Robertson, 2011; Purcel and Xie., 2014). For example, it was shown that students are not fully equipped with the required reflective abilities for processing the data posted on blogs in order to produce cognitive connections with the material, thereby resulting in poor performance when mapping concepts to existing theories and real-time scenarios (Deng and Yuen, 2011; Kerwalla et al., 2009).

In section 2.6.4, it was discussed that blogs afford the incremental development of cognitive abilities after being exposed to learning material on blogs. For example, the student might reconsider or restructure the concepts in the light of newly learnt material on blogs. Nonetheless, this affordance of blogs is only possible when the students possess an adequate level of critical thinking and reflection on the subject matter. Kerwalla et al. (2009) revealed that the students in their study could not meet the expectations of the instructors in terms of development of critical reflection. Another study reported that only 20 percent of students were able to develop an adequate level of critical reflection over the learning material posted on blogs as required by the instructors (Hall and Davison, 2007).

Furthermore, blogs are also shown in some contexts to restrain the occurrence of meaningful peer interaction because conversations are usually shorter and the frequency of replies/posts is lower than what is required for effective collaboration. The time constraints and the lack of resourcefulness are considered to be main factors resulting in the poor peer-peer interaction on blogs (Halic et al., 2010; Deng and Yuen, 2011). The meaningful interaction happens between two users on blogs, if both of them contribute equally to the process of building knowledge and solving problems. Infrequent and short conversations hinder the abilities of users to expand thoroughly on the nuances of the subject matter, which not only affects the realisation of the affordance of blogs in areas of peer-peer collaboration, but also in that of social interactions (Du et al, 2010). Kerwalla et al. (2009) demonstrated that on reviewing the comments and posts from students, instructors found shallow discussions and a lack of meaningful dialogues during peer-peer interactions.

Some authors have attributed the poor peer-peer interaction and effective collaboration to the blog ownership (Deng and Yuen, 2011). Noel (2015) argued that blogs are usually owned by individuals or private companies which do not allow the users to make modifications to the direction of discussion or to take control of the discussion, although this is not the case in educational institutions which mostly control the digital technologies at the institutional level. The lack of content-driven discussion and learning means students feeling demotivated about participating and collaborating with other users, and promotes more social communication rather than intellectual dialogue among the blogging members of learning communities (Halic et al., 2010; Deng and Yuen, 2011).

Taken together, it can be argued that the efficacy and efficiency of blogs as an educational tool can be limited if the needs of students and educational institutions are not considered at the design phase. The cognitive development of students at various levels needs to be understood, and academic institutions should control the design and implementation phase, as teachers are a great source of providing reliable information regarding the academic progress of students. In addition, control by educational institutions can direct the communications on blogs to useful topics and materials to meet specific educational targets.

After having reviewed the literature on limitations of blogs as a learning tool, it is important to recognise the factors which assist their implementation in the educational environment. Reviewing the enabling factors of blogs provides me with knowledge that can either contribute to the success or failure of the proposed educational blog in this study. The next section will review the enablers for blogs in the educational context.

## 2.8. Enabling Factors for Blogs in the Educational Context

Regarding the affordances of blogs, it is clear that they have great potential in improving the learning processes. However, the success of blogs as a learning tool is highly reliant on a number of factors. This section discusses the key enablers for blogs in the education context.

### 2.8.1. Accessibility and availability

The information regarding social computing applications and their utilisation have become widespread, informing the decision-makers of a plethora of options to select from. In addition, social computing devices tailored to cater to the educational needs of specific audiences are also available: for instance, blogs for language learners, medical practitioners, teachers and students are tested and implemented in various educational backgrounds. Training programmes for teachers are freely available and accessible. Several countries have launched social computing projects including blogs in order to assist the learning and education process (Redecker, 2009).

For instance, Germany launched the “Schule2.0” project, which aims to train teachers in social applications and applications in the classroom through promoting collaboration between students and teachers. Similarly, the “INTERACTiC 2.0” project was initiated in Portugal and proposes to promote constructive thinking, critical reflection, collaboration between educators and between students and educators, and integration of digital learning culture in the school (Redecker, 2010, Redecker, 2009). These data showed that developed countries have sufficient expertise, infrastructure, training, and experiences in initiating and implementing blogs in the educational system for creating a digital learning environment.

However, the situation in developing countries is quite different: the digital divides between regions are quite high; variations in educational culture present the stark differences, such as private schools and public schools having starkly different educational cultures and learning/teaching resources (Heo et al., 2010). These factors might impede the integration of social computing applications. Access to information and communication technologies is fundamentally important for making social computing projects successful in the educational context. Many studies have reported that student access to social computing applications, awareness of use, and availability of training for teachers can promote the success of computing applications such as blogs in the educational setting (Meisalo et al., 2011; Fullan and Langworthy, 2013). Redecker (2010) explained a mature institutional infrastructure is needed for supporting the e-Learning 2.0 project, to successfully pilot and launch the learning projects through the integration of social computing applications. This institutional maturity depends on a number of factors such as previous exposure to e-Learning 2.0 applications in learning; teachers; training resources; and infrastructure. Redecker (2009) posited that availability of social computing tools for promoting educational purposes is required for the successful implementation of projects.

Taken together, the accessibility and availability of the social computing tools, opportunities for training for teachers and institutional maturity in handling the e-Learning 2.0 projects are the key success factors for implementation.

### 2.8.2. Functionalities and user skills

The functionalities of social computing tools constitute another factor for deployment of an e-Learning 2.0 project in educational and training institutions (Dwivedi et al., 2011). Scantlebury (2008) explored the impact of different social networking tools on the professional development of lecturers at the Open University (UK); they found that social computing tools have different levels of functionality for different users, and even the experienced users with IT skills struggled to familiarise themselves with the functionalities supported by the social computing tools. They further stated that participants showed their frustration with some of the complicated functionalities.

Another study reported the lack of face-to-face support for maintaining weblogs. The outcomes of the study showed that though a personal weblog is an important element of the Educational Blogs Project, the continuous support to converting weblog as an e-portfolio is critically important for adoption of blogs into the educational system (Chuang et al., 2008). Tuten and Marks (2012) found that participants often struggle to manage the functionalities such as accessing the data without having control or a chronological structure to the data. The lack of time to grasp the functionalities, prior knowledge of the blogs’ functions and interest in using the blogs were found to be main factors behind the poor engagement with the blogs’ functionalities.

Several other studies have reported that ease of use, in terms of handling the objects and elements in the design of blogs, is another factor for promoting the successful adoption of blogs (Lai and Chen, 2010; Tyagi, 2012; Dhume et al., 2012; Churchill, 2009). Similarly, the IT skills of users, such as browsing blogs, writing posts, creating new content and communication within the interactive environment of blogs helped students to adopt blogging technology for learning and productive engagement with peers (Churchill, 2009; John, 2015; Vurdien, 2013; Papstergiou et al., 2011). These studies argued that both students and teachers are required to show an understanding of the functionalities and design and IT skills required in order to obtain productive learning and teaching outcomes.

Murugaiah et al. (2010) posited that students and teachers who become acquainted with social media applications during their daily engagement with digital devices should not be taken for granted in relation to their expertise in handling the functionalities of blogs for educational purposes. Therefore, educators and designers of blogs should focus on simple design and provision of ample support to students and teachers for adopting blogs to enhance their learning and skills.

### 2.8.3. Students’ attitudes towards blogs

Students’ attitudes towards the blogs is another important factor which can play an important role in making educational blogs either a successful educational project or an utter failure (Bakar, 2009; Shih, 2010). The students are recipients of services from the technologies; therefore, their attitude towards blogging projects in this context is given high priority by most scholars. Makri and Kynigos (2007) reported three types of attitudes among the mathematics teachers in Greek, which include the “blog sceptic”, the “blog frequent visitor”, and the “blog enthusiast”. Burgess (2006) posited on students’ attitudes towards blogging that some of students have accepted “blogging like ducks to water, while others were bemused, reluctant or downright hostile to the idea” (p. 35).

Halic et al. (2010) observed that continuous use of blogging motivates users to use it more, which exerts an amplifying effect on that user. The increasingly motivated users showed productive engagement with peers and an improved learning process. In other words, acceptance of the blogs by students for learning warrants the success of blogging as a learning tool. Yang and Chang (2012) reported that integration of needs, preferences and attitudes towards blogging is highly important prior to consideration of development and implementation of educational blogs.

Kerawalla et al. (2008) noticed some distinct behaviours among the students towards the adoption of the blogging tool. Some students used this tool for providing educational support to each other, while some students only employed blogs for enhancing their critical reflection. Some of the student utilised blogging to establish the subject-specific resources for seeking help from peers. Similar findings were produced by Farmer et al. (2008) while studying the styles and behaviours of the students at the University of Melbourne (Australia).

In summary, considering the preferences, needs, and learning styles of students can help the educational and training institutions to design and implement the robust blogging tools that can be successfully adopted by students, with better impact on the learning process.

### 2.8.4. Peer interaction patterns

The research has showed a pronounced impact of peer interactions, knowledge of participants and the interaction patterns for communication with each other in blogs based on collaborative projects. Scantelbury (2013) observed that although the functionalities of blogging tools and other social computing applications have been critically important in the adoption of such tools among students and teachers, they assume secondary importance when the enthusiasm for social networking is considered. The sharing of common interests, supporting a common cause and clear definition of communication objectives are important drivers for establishing the learning communities and collaborative learning activities. Poor quality discussion, line of debate or input from the members in collaborative-learning projects can demotivate the participants, thereby decreasing the participation in social-computing-supported learning projects.

Cho et al. (2007) supported the contribution of pre-existing social networks of individual and communication styles to the establishment of the online learning communities. The achievements of the members of online learning communities were recorded as higher than those who individually tried to establish contact with dispersed social members, which clearly highlights the positive impact of coordinated communication and structured learning on the success of social computing tools for learning.

Previous studies have found different interaction patterns among students participating in collaborative projects. Liu and Tsai (2008) investigated the peer interaction patterns among undergraduate computer science students who were using the ‘discussion forum’. They found that students with heterogenous abilities could exchange knowledge with each other effectively, while the students with similar educational backgrounds and experience levels in using discussion forms were able to exchange the knowledge more effectively. They suggested that teachers’ involvement in increasing the performance of students through blogging as a teaching tool is important for facilitating the effective knowledge-sharing between student-student and student-teacher.

Oliveira et al. (2011) found that social cohesion was an important factor in promoting the emotional bond between users, which was necessary to enable the smooth flow of knowledge between them. The propensity of participants to cooperate with each other and respect each other’s views are reported to be paramount in terms of enabling the exchange of knowledge among users through group interactions (Heo et al., 2010; Tinoca et al., 2010). Lee and Bonk reported similar outcomes for postgraduate students using reflective blogs. They showed that a ‘sense of community and peer connectedness’ are highly valuable for making the use of reflective blogs successful.

### 2.8.5. Institutional support for blogging projects

Several studies have indicated that the scaffolding of the learning process through provision of technical and emotional support along with financial incentives and appreciation are vital for facilitating the implementation of social computing projects in educational and training institutions. Research conducted by Wang and Woo (2007) investigated the perceived performance of students in face-to-face discussions and online communications, and revealed that more time and support from educational institutions was required for success with online discussions compared to face-to-face discussions. Several other studies emphasised that there is ample time for students to enable them to become acquainted with functionalities of blogs and other social computing applications along with adequate guidance and supervision for achieving the improved learning outcomes for students (Scantlebury et al., 2008; 2012; Redecker et al., 2009).

Scantlebury et al. (2008) concluded that support from the training institutions becomes important in the event of delivery to a group with heterogenous abilities and with cultural diversity, through the collaborative projects on blogs. Similar findings were generated by Ellison and Wu (2008), who found that administrators of education and training programmes to university students through collaborative projects could find success if ample guidance is provided to students regarding the reviewing strategies and critiquing the posts. Furthermore, de Frietas (2007) argued that effective implementation of blogging projects for learning could be achieved through planning support activities along with design considerations.

Support and guidance are critical factors for enabling students to use blogs for self-reflection, learning and discussion with peers and teachers. Several other authors have found that institutions planning for improving cognitive development, critical thinking and reflection among students through blogging projects need to offer appropriate mentoring and guidance to students in order to improve their performance in the aforementioned areas of learning (Kanuka et al., 2007; Carletti et al., 2008; Antoniou and Siskos, 2007). Fovet (2009) also stressed the need for institutional support and guidance to students regarding how the management of online discussions, critiquing the learning material and reviewing online information can improve the success of social-computing-based collaborative projects.

Several studies have provided evidence of different levels of support in the beginning and later stages of collaborative learning projects supported by the social computing applications (Conole et al, 2008; de Freitas, 2007, Redecker, 2009). For instance, teachers can provide pedagogical support and guidance in the beginning phase of the blogging project for learning, which can progressively transform into a facilitative approach aiming to coordinate activities of students on social computing platforms (De Laat, 2007; de Freitas, 2007). These factors can cumulatively increase the chance of successful adoption of the social computing-based learning projects in the educational and training institutions (Blin and Munro, 2008). The next section will present the barriers for the use of blogs in education.

## 2.9. Barriers for the Use of Blogs in Education

Luján-Mora and de Juana-Espinosa (2007) reported that barriers to the adoption of blogs are low as they are part of the ubiquitous technological framework which surrounds the learning environment in educational institutions. Despite all the affordances of the blogs in education, there are some of difficulties or challenges which may slow down the adoption of the blogs in educational and training systems.

### 2.9.1. Security and privacy concerns

Most of the blogs are hosted in free active server pages (ASPs) and public domains, which exposes them to malicious hacker attacks, and the use of marketing companies to advertise the products. These factors discourage the students from signing into the weblogs for learning purposes. Luján-Mora and de Juana-Espinosa (2007) reported that students can become reluctant to use the weblogs for security concerns. The free blogs hosted in public spaces on the web enable inauthentic users to sign in with fake names and profiles. This might lead to the dissemination of false information or unreliable data, thereby affecting the overall quality of the learning. The security concern in terms of the community of practice on weblogs is heightened due to the possible loss of data or misinterpretation of posts by other users and sometimes employers (Dema and Moeller, 2012; Chuang, 2010). These concerns can be a potential barrier to the use of weblogs as learning instruments at educational and training institutions. Several scholars have emphasised the need for private servers or institution-sponsored servers to host the weblogs for students, so that they can enjoy a hassle-free learning process (Ching and Hsu, 2010; Hemmi et al., 2009; Minocha, 2009).

The online conflicts between communities with opposite views can lead to a series of inflammatory and insulting posts, which can lead to the instability of the online learning space. The users in weblogs do not have face-to-face interactions with each other (Luján-Mora and de Juana-Espinosa, 2007). The posted material can be interpreted by other users in different ways, which, if not clarified by the individual who posted it, can cause provocative reactions from other users. The training of learners to use the weblogs productively and teach tolerance towards each other’s views is critically important for implementing weblogs in educational and training institutions (Hemmi et al., 2009).

### 2.9.2. Teachers training and skills in using digital applications

The lack of confidence in social computing applications from teachers or training institutions is considered a main barrier in the way of adoption of social media platforms for development of skills and knowledge. Hussein et al (2013) posited that low levels of technological expertise, less awareness of technological utilities and limited empirical evidence supporting the use of social computing applications are major contributory factors to decreased confidence in social media platforms. A survey conducted by OECD (2008) showed that teachers are technologically competent, but they are not motivated to take advantage of their competencies to use social media applications for training and educational purposes.

Balula and Moreira (2014) offered three reasons to explain the paradoxical behaviour of teachers towards integration of online learning technologies in educational and training courses for teachers. Firstly, both the government and educational/training institutions are reluctant to provide incentives or motivational packages to innovate teaching and training methodologies. Secondly, training and educational institutions show little aptitude for using empirical evidence to identify effective pedagogical strategies. Thirdly, teachers lack vision and practical exposure to the wonders which can be achieved through technologically- mediated educational and training events. These reasons suggest that there is a need to revise the training portfolio of teachers in order to motivate them to use social computing applications as part of their learning and skill development programmes.

The low level of exposure of teachers to innovative methods is partly attributed to the fact that during training programmes teachers are trained by traditionalists who put more emphasis on the traditional approaches rather than technologically enhanced pedagogical practices, thereby resulting in limited attention to the exploitation of technology related competencies (Deshpande et al., 2014; Istambul, 2012). A transformation in teaching practices and skills development can only mediated if teachers are trained by innovators and ‘out-of-the-box’ thinkers during training events (Higgins, 2014).

In addition, most teacher-training events are based on face-to-face communication, which raises some additional challenges in terms of successful adoption of online learning technologies for learning and skills enhancement among students and teachers (Bullen and Morgan, 2016; Jones and Sclater, 2010). The advice and information received by teachers in most of the developing world, and in some cases in the developed world such as the UK and the US, are not given in accordance with the latest developments in technology (Istambul, 2012). Bossu and Tynan (2011) argued that a radical restructuring of the social and cultural environment is essential, along with the transformation of training programmes to facilitate the use of social computing applications in educational and training systems.

Instructors and teachers are not fully trained to harness the real benefits of social computing applications, such as blogs, in the education system. Shoffner (2009a) highlighted the difficulties tutors face in assessing students’ assignments, and other learning material through the participation of students in blogs. Wopereis et al. (2010) pointed to several factors which need to be considered while assessing the students’ achievements such as quality of posts, student participation in the online discussion, individual postings, and group grading. Furthermore, subjective appreciation is very important for increasing the motivation of learners that use blogs. However, these activities are not fully utilised by teachers, which can be a barrier to the implementation of blogging as a learning tool in the educational and training institutions (Shoffner, 2009b).

### 2.9.3. Accessibility and digital skills of students

Different scholars have argued that the introduction of digital technologies in homes and schools can be a source of inequalities in the education system (Sharpe et al., 2010). Accessibility is considered an important factor in reducing the spread and proliferation of digital media in educating the young generation in the digital era, which is mainly due to the lack of equal opportunities among all homes and schools to teach children using the digital technologies (Gibson et al., 2015; Hussein et al., 2013). In addition, the users of the digital technologies are not in possession of the right skills to benefit from the learning mediated by the e-Learning 2.0 tools, thereby putting experienced users at a greater advantage of learning and acquiring skills compared to the relatively less experienced users with lower levels of accessibility to such learning technologies (Seale, 2013; Beetham and Sharpe, 2013). Therefore, several studies have pointed to the fact that implementation of e-Learning 2.0 tools for students and teachers cannot be a successful endeavour until and unless a framework is created with equal opportunities in terms of acquisition of digital skills and accessibility in the educational and training institutions (Wolfe and Andrews, 2014; Lemoine and Richardson, 2015).

The technological use and expertise of students may be another barrier in the way of successful adoption of blogs in the educational context. The expertise of learners in using the blogging technology for learning varies from student to student (Hemmi et al., 2009). Currently, there is an assumption among educational administrators that all students are expected to benefit from social computing applications such as blogs. This notion should be replaced with the more realistic and pragmatic approach of assessing the abilities of students to use blogging for learning. Based on the findings of the surveys and assessments, educational blogs can be structured to enable all students to gain an equally advantageous position (Stockwell, 2013; Dema and Moeller, 2012). Cordoba and Piki (2012) argued that the disparity among students in learning from blogging results from the variations in the levels of their use of technological. In addition, the cost of learning through online technologies, such as the rising prices of internet, or lack of sufficient infrastructure, such as computer laboratories and personal computers, can threaten the widespread application of blogs in educational settings. This issue can be more obvious in the developing regions of the world such as Asia and Middle East, which is mainly because of the lack of infrastructure and funding to support technological projects and teachers’ motivation to adopt the digital technologies in the classroom.

The Communication and Information Technology Report (2010) suggested that internet usage had increased among Saudi people due to the government-sponsored campaigns to provide internet facility in each and every corner of the Kingdom. There was an increasing trend of laptop use compared to desktop use from 2007 and 2009, which was related to the easy mobility of the computing devices. The report also mentioned a 44 percent increase in internet use in 2007 and a 4 percent increase in internet use between 2007 and 2009, which represented a slow adoption of the Internet. The main reason behind this slow adoption of internet or internet-based communication was reported to be the lack of skills in browsing, searching information and communicating through digital devices (Communication and Information Technology Report, 2010). These statistics indicated that the lack of accessibility and digital skills among all Saudi citizens might cause a threat to the successful implementation of social media projects for increasing learning and development of skills among teachers and students.

## 2.10. Conclusion

Digital technologies have created a plethora of opportunities for educational institutions and training systems to innovate their pedagogical research designs in order to improve the learning outcomes of students. These opportunities have mainly resulted from the changing learning characteristics and attitudes of learners: the desire for instant communication, accessing learning material using online channels, communicating through digital applications, working in teams, and learning through collaborative strategies rather than teacher-centred approaches. The ubiquity of digital devices and social media platforms has given rise to the phenomenon of learning through social networks and the interactive environment. Educational and training instructions are more focused on exploitation of the social computing platforms to educate and train learners in the ever-evolving digital era.

There are various applications of social computing, which involve blogs, online office applications, media-sharing platforms such as YouTube, social networking sites such as Facebook, blogs, wikis and LinkedIn. Though social computing platforms are being applied by educational and training institutions in designing educational and training programmes, blogs have caught the attention of students and educators equally to provide a space for productive interaction, exchange of learning material, reviewing posts, and critically analysing the learning material for assessments and feedbacks. This has resulted in the creation of different forms of blogs such as teacher blogs, student blogs, and class blogs. Blogs have attracted learners due to the interactive environment, accessibility of posts communicated in the past with other users, and the different options of uploading and accessing the learning material such as the picture format, and video and audio formats.

Due to these characteristics, blogs afford the development of social networks, collaborations with other users, and improvement in the reflection and cognitive abilities of learners. Blogs can also support a constructivist learning environment for construction of new forms of knowledge, and development of innovative pedagogical practices. However, the impact of these affordances can be restricted in terms of the absence of active institutional support, less time to interact with others, and shorter communication bursts. These obstacles need to be overcome in order to enable the widespread use of blogs in educational institutions. Despite these limitations, some factors such as students’ positive attitudes towards blog-based learning, institutional support, and peer interactions characterised by in-depth analysis of posted material can enhance the opportunities for reaping the full benefits from the implementation of blogs in educational institutions. Careful planning at the design stage of blogging applications, along with integration of students’ preferences in the blogging-based instructional designs, can be helpful in increasing the effectiveness of blogs in educational and training institutions.

Based on data reviewed in this chapter, students’ motivation to use blogs was a key factor in the increase in adopting them. The collaboration of like-minded users with each other via blogging platforms generates a sense of community leading to the development of communities of practice. The peer interactions and networking within communities of practice are the key determinant for the future proliferation of blogs in the educational context. This leads me to develop the following research hypothesis: blogs can be an effective medium for achieving learning objectives (the construction of knowledge and skills) among students. This hypothesis will be tested by adopting the conceptual framework based on self-determination theory, which will be discussed in the next chapter.

# CHAPTER THREE

# CONCEPTUAL FRAMEWORK

## 3.1. Introduction

In the previous chapter, the empirical data regarding the applications and affordances of digital technologies, especially in the field of blogging in the educational context, were discussed. In this chapter, the conceptual framework is presented, which forms the underlying basis of this study, it discusses self-determination theory (SDT). A detailed discussion on the utility and application of SDT in the context of the acquisition of skills and competencies in the digital based learning system is presented with a focus on three key dimensions that should be supported in any virtual learning system, which are autonomy, competence and relatedness. The chapter closes by focusing on the development of an evaluation framework for the proposed blogging platform.

## 3.2. Choice and Justification of the Theoretical Framework

The main aim of this study is to assess the potential of social computing applications with a focus on blogs as a learning and professional development tool for student teachers in Saudi Arabia. I therefore engaged with self-determination theory (SDT), which integrates all elements into the motivational framework in order to facilitate the professional development of students in terms of acquiring new knowledge and constructing knowledge, combining the autonomy and competency activity theory, social learning theory and constructivist learning theory into one organic whole (Deci and Ryan, 2012). This is because SDT captures all relevant dimensions of learning in the virtual environment. Therefore, this theory was chosen to structure the conceptual framework for this study. SDT also helped me to satisfy the aims and objectives of this study from ontological, epistemological and methodological perspectives. This study is based on the assumption that peer-to-peer interactions in the virtual environment of digital technologies leads to the acquisition of knowledge and skills development, which ultimately form the basis of the professional development of student teachers. Social interactions can be productive virtual events.

## 3.3. Self-Determination Theory

SDT is recognised as one of the empirically tested macro-cognitive theories of motivation in different educational settings (Niemiec and Ryan, 2009). This theory was tested by several researchers in online learning systems to examine the effects of SDT on the learning outcomes of students in L2 learning and online learning environments. For example, Cheng and Dörnyei (2007) found a link between extrinsic motivation and the achievement of second-language students in Taiwan by applying SDT theory. They rated teachers’ opinions in terms of the efficiency of their motivational strategies, and revealed that teachers whose intrinsic motivation was increased through autonomy were effective in achieving the learning objectives for second-language students. A similar conclusion was reached by Yashima (2009) who found, for Japanese students, that both extrinsic and intrinsic motivational strategies were important for improving the academic performance of the second-language students in Japan. Chirkov (2009) applied SDT to investigate the achievement of study goals among foreign students using questionnaires, and demonstrated that the career-oriented goals played an important role in enabling international students to achieve their academic goals.

Several scholars have successfully assessed the learning outcomes mediated by intrinsic and extrinsic motivation using concepts from SDT (Fortier et al., 2012; Stone et al., 2009; Shogren et al., 2016). Stone et al (2009) posited that SDT is important from the perspective of assessing factors which can either promote or forestall the growth-oriented learning process of students in a specific learning structure. Therefore, SDT provides a tremendous opportunity for educators to gain a deep insight into the learning potential of students, which can be exploited to tailor the learning structures based on the learning needs of students (Nikou and Economides, 2017). SDT also recognises the external factors acting on students to promote the learning process, and it allows educators to test their contingencies or external controls for achieving learning outcomes in educational and training systems (Ryan and Deci, 2008).

Ryan and Deci (2000a, p. 68) posit that SDT investigates “people’s inherent growth tendencies and innate psychological needs that are the basis for their self-motivation and personality integration”. This statement shows the real function of SDT is to discover the means/factors in learners’ personalities and in their surroundings, so they can be motivated to adopt a particular learning process. Put another way, Roth (2014) noted that educational institutions can apply SDT to foster the inner resources of students in order to enable them to enhance self-regulation. They went on to say that the application of SDT with consideration of social values and learning styles can enable teachers to induce an intended learning behaviour among students. Hence, SDT can be an important part of the learning and knowledge management systems.

Deci and Ryan (2012) state that the main emphasis of SDT is on the motivation of learners to achieve learning objectives. Motivation, as defined by Ryan and Deci (2000b, p. 54) , is“to be moved to do something”. A person who does not feel any urge to do or complete any task is characterised as an ‘unmotivated’ person, “whereas someone who is energized or activated towards an end is considered motivated” (Ryan and Deci, 2000b, p. 54). The greatest challenge for researchers and practitioners lies with a complexity of factors affecting the motivation of learners. Therefore, Ryan and Deci (2000a) argued that motivation is not a singular or unitary phenomenon due to the plethora of factors involved in affecting the experiences and outcomes of the activities (see sections 3.4.1 and 3.4.2).

Learners can be motivated to adopt learning pathways because of the value attached to the learning process/activity or because of the presence of a strongly coercive element in the learning process emanating from either teachers or parents (Ryan and Deci, 2008). They can also be urged to perform certain learning actions, such as gaining expertise in reading or writing skills, due to a mere ‘abiding interest’ in the learning activity. Students may be motivated to accomplish homework due to their curiosity or interest or because of the urge of gaining appreciation, rewards or approval from teachers/parents/friends (Ryan and Deci, 2000a). Similarly, the acquisition of new skills by learners, such as using different functions of social computing applications or the application of social computing for improving writing and communication skills, may be because they feel that such skills are highly valuable for achieving higher grades, finding employment in the market, and in assuming leadership positions in solving issues encountered by peers.

SDT assumes that motivation is mediated by multiple factors, and the degree of the motivation of learners can be varied with different learning activities. The learners can be motivated from their ‘inside’ (intrinsic motivation) or external pressures (extrinsic motivation) can lead them to accomplish learning actions; the contrast between internal forces versus external pressures are obvious to everyone (Niemiec and Ryan, 2009). However, whether people may stand behind their behaviours or may be regulated by external factors is matter of debate in every culture. The propensity to perform actions based on willingness or to accomplish things based on social-culture pressures varies from culture to culture (Ryan and Deci, 2008, 2011b; Zhang, 2005). This necessitates the exploration using SDT of factors affecting the motivation of learners in individual cultures, so that a clear insight can be developed about the internal and external motivational factors. Consequently, such data can be useful for educators to plan, develop and implement a comprehensive learning framework for learners within a particular socio-cultural context (Zhang, 2005; Ryan and Deci, 2011a). The following section sheds light on the concepts of intrinsic and extrinsic motivations as defined by SDT in the context of learning systems.

### 3.3.1. Intrinsic motivation in the context of learning system

According to Ryan and Deci, intrinsic motivation is the:

…doing of an activity for its inherent satisfactions rather than for some separable consequence, when an intrinsically motivated a person is moved to act for the fun or challenge entailed rather than because of external prods, pressures, or rewards.

Ryan and Deci (2000b, p. 56)

Otoshi and Heffernan (2011) argue that the ultimate objective of motivation is to accomplish a certain process or activity, and the satisfaction with the outcomes of the activity leads to the continuance of the motivation level. The persistence of the motivation of learners results in better learning outcomes as a consequence of the adoption of learning technologies. The concept of intrinsic motivation was empirically corroborated by White (1959) who used the animal model to show curiosity-driven behaviour, playfulness and engagement in exploratory activities without seeking any material reward.

The psychological research comparing the instincts of animals and humans concluded that animals exercise their abilities or extend their capabilities through curiosity-driven behaviours; humans also engage in such behaviours in order to learn new concepts and skills (Ryan and Deci, 2000b). It should be noted that human beings are described as more curious and inquisitive in nature since their birth than animals, and the level of curiosity and demonstration of learning different and innovative knowledge and skills increases as they continue to acquire knowledge and skills compared to animals (Deci and Ryan, 2012). This innovation, curiosity and inquisitiveness among humans classifies us as intrinsically motivated animals adopting the learning process throughout our life journey (Nguyen et al., 2011). Put another way, it can be argued that desire to engage in innovative activities in order to gain knowledge and strengthen skills is embedded in the socio-physical and cognitive developments of human individuals. The acquisition and application of novelties and creative potential are part of human nature, but it also impacts on the performance of human beings as learners and their wellbeing in all fields of life (Stone et al., 2009). However, the views of Stone and his colleagues can be challenged by considering variations in the academic achievements and social wellbeing of learners, which indicates that all learners are not able to fully utilise their creative potential.

The presence of intrinsic motivation between the activities and individuals is supported by different scholars in the field of human motivation (Ryan and Deci, 2000a, 2000b; Otoshi and Heffernan, 2011). Based on this, some scholars have defined intrinsic motivation in terms of the satisfaction of an individual achieved by ‘intrinsically motivated task engagement’. Niemiec and Ryan (2009) have raised the question as to how the reward of the intrinsically motivated person lies in the task, which initiated the research projects exploring the task characteristics leading to the induction of the intrinsic motivation of learners in the education discipline. The researchers have applied the tenets of the learning theory proposed by Hull (1943) suggesting the adoption and accomplishment of tasks is based on physiological needs. The activities that can motivate learners intrinsically such as appreciation, rewards and accepting challenges are reported to exert a positive influence on the “satisfaction of innate psychological needs” (Ryan and Deci, 2000b, p. 55). The intrinsically interesting properties of tasks formulate the sound basis for arousal of intrinsic motivation. Moreover, SDT supports the presence of three innate psychological needs including autonomy, competence and relatedness for adopting and accomplishing the learning tasks, which are discussed in section 3.5.

Further, Deci (1981) investigated the effect of the controlling behaviour of teachers versus autonomy-supportive behaviour on students’ autonomy and academic achievements. They showed that intrinsic motivation to become engaged with the learning material was increased significantly among students with autonomy-supportive teachers compared to the ones with controlling teachers. Grolnick and Ryan (1987) demonstrated that students who study mathematics to teach others were better intrinsically motivated compared to the ones who learnt mathematics to take exams.

Similar results were produced by a study in Japan by Kage and Namiki (1990) who involved students from schools and used three experimental conditions: self-evaluation, criterion-referenced evaluation, and norm-referenced evaluation. The authors used questionnaires to collect data. The data showed that intrinsic motivation was higher among the criterion-referenced group and self-evaluation group compared to the norm-referenced group, which was due to the higher autonomy experienced by these two groups. Black and Deci (2000) showed a similar effect of the autonomy-supportive behaviour of teachers on the intrinsic motivation of students. Lee et al. (2005) showed that intrinsic motivation was improved by increasing the enjoyable and fun aspects of learning for undergraduate students in the internet-based learning medium. Deci and Ryan (2010) argued that learners who play and learn together were better intrinsically motivated to perform well and achieve higher grades compared to the one who focused on only learning. Another study conducted by Vansteenkiste et al. (2004) demonstrated that college students showed effective engagement with peers, wellbeing and personal growth in the environment where teachers supported the autonomy of students. In addition, the intrinsically motivated students showed higher performance in terms of achieving higher grades and persistence in their performance and achieving their life goals.

In an online learning environment, some studies have reported the positive effects of social interactions on the intrinsic motivations of learners. The value of the task and sharing of information also put a positive influence on the intrinsic motivation of students to acquire knowledge and new skills (Yang et al., 2006). Xie et al. (2006) applied SDT to the online learning system, and found that intrinsic motivation was increased as a result of peer-to-peer feedback and positive associations between the students, while a careless attitude from other learners in the online discussion decreased the intrinsic motivation of students to participate in it. Barak et al. (2016) used SDT in order to determine the effect of MOOC-assisted learning on the intrinsic motivation of studying undergraduate courses in Arabic and English language instruction in Saudi Arabia. They used a mixed methods research design involving 315 participants from the classes using English and Arabic MOOC platforms for delivering course contents. They found that problem-solving and networking of students with each other as supported by the MOOC exerted a positive influence on the intrinsic motivation of learners to engage in the online learning process.

Taken together, intrinsic motivation is associated with building an autonomy-supportive learning culture, along with creating opportunities for learning, networking and enjoyment in the learning process. Xie et al. (2006) rightly pointed to the drawback of the traditional learning system in hampering the existence and development of the aforementioned factors in the learning environment. Online learning, if properly managed with respect to improving the fun and productive discussions, can lead to higher student performance in the context of achieving knowledge and developing new skills.

### 3.3.2. Extrinsic motivation

Though intrinsic motivation constitutes an important type of motivation, it does not cover the engagement of learners with tasks and activities designed to meet learning objectives. SDT proposed the extrinsic motivational construct to refer to the engagement of learners with activities leading to achievement of separable outcomes rather than having personal enjoyment or fun (Niemiec and Ryan, 2009). This definition shows the contrast between extrinsic motivation and the intrinsic motivation. Though many scholars have argued that extrinsic motivation belongs to invariably nonautonomous behaviour, SDT reinforces the alignment of extrinsic motivation with autonomous behaviour to different levels (Ryan and Deci, 2000a, 2000b).

For example, the learner who completes their homework due to fear of punishment from teachers is extrinsically motivated to do so in order to achieve the separable outcome, though it does not involve his/her personal choice. Similarly, if a learner gains a set of skills in order to obtain promotion or it is needed for employment, he/she is extrinsically motivated to achieve those skills. In the latter example, the extrinsic motivation is the personal choice. In both examples, the key message is that extrinsic motivation may be different from the perspective of autonomy level (Ryan and Deci, 2000b). It should be acknowledged that the relationship between the extrinsic motivation, autonomy and achievement level is complicated, and is affected by several contextual factors such as social pressures, intrinsic choices made by learners and the level of support offered by the learning environment for students to be autonomous and innovative.

The issue faced by educators is how to motivate the students to participate in learning activities. Motivating students in the classroom to engage in the learning material carries the element of extrinsic motivation due to external pressures. In other words, the design of the activities should carry some personal interest or intrinsic value for students in order to stimulate the self-regulation and self-appreciation of activities (Niemiec and Ryan, 2009). This issue is addressed by SDT with the incorporation of the concept of internalisation and integration of values associated with learning tasks (Deci and Ryan, 1985). According to Deci and Ryan (2000b, p. 60), “the process of taking in a value or regulation, and integration is the process by which individuals fully transform the regulation into their own so that it will emanate from their sense of self.”

The internalisation refers to the different levels of motivation ranging from the state of complete unwillingness to engage in the learning activity, which is called amotivation, from the state of passive compliance to the state of active compliance with the integration of personal commitment. With an increase in the personal commitment level, the learner becomes more self-regulated and shows higher levels of persistence to complete the work. Subsequently, the higher quality of engagement and positive self-perceptions are the outcomes of the greater level of internalisation associated with a certain task.

SDT proposed the taxonomy of human motivation, which involves the stages of motivation (Figure 3.1).

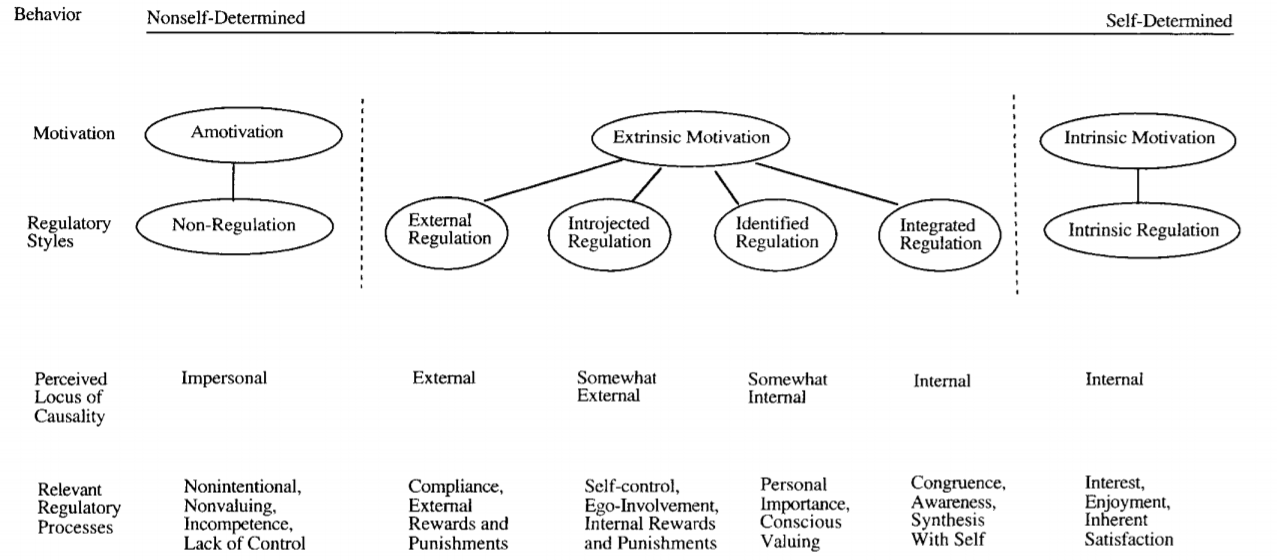


Figure 3.1: Different levels of motivation as proposed by self-determination theory (Ryan and Deci, 2000a)

Amotivation is the state in which learners feel that the given task is unlikely to yield the desired outcomes, which results in the disappearance of two elements – sense of personal causation and intentionality –which are usually required for the accomplishment of the given learning tasks. The sense of incompetence also leads to the state of amotivation, which is related to a learner’s belief that he/she does not possess the required level of skills to complete the job (Deci and Ryan, 1987) or the lack of any value attached to the job also gives birth to amotivation among learners (Deci, 2004).

### 3.3.3. External regulation

The SDT model in Figure 3.1 also highlights the different stages of autonomous extrinsic motivation including external regulation, introjection, identification, and integration. The category of external regulation represents the set of behaviours which are triggered to achieve the externally controlled reward contingencies or to fulfil the externally imposed demands. The learners showing externally regulated behaviours retain the locus of causality outside of the personality, indicating the alienation of actions from the sense of self (Ryan and Deci, 2000a, 2004). The externally regulated motivation was recognised by the operant theorists such as Skinner (1953) and was well-researched in the early debates on motivation and laboratory studies (Ryan and Deci, 2000a). Of note, Skinner’s work on motivation to perform and repeat certain behaviour (operant conditioning) is criticised for its failing to explain the cognitive and inner mental factors leading to the execution of learning and displays of behaviour (McLeod, 2015). The relevant regulatory processes which cause the actions of the learners include compliance with coursework, standards of assessment, rewarding the learners with high grades and appreciation and the punishment of students with failure or low grades (Deci and Ryan, 2010).

#### 3.3.3.1. Introjected regulation

The second category of extrinsic motivation is called introjected regulation, which pinpoints the presence of both internal and external regulations: for example, when a learner participates in the activity to gain pride or avoid the feeling of embarrassment/guilt. The winning of pride and appreciation provides a sense of pleasure to learners, while avoiding guilt is an external locus of causality arising from the involvement of assessors to examine the performance of learners in a particular learning activity (Deci and Ryan, 2004). Therefore, Ryan and Deci (2000a) described the introjected regulation as a “regulation by self-esteem”; the classic example of introjected regulation is the ‘ego involvement’, which motivates the person to accomplish certain tasks in order to gain higher social status, having the feeling of being valued and maintaining self-esteem.

#### 3.3.3.2. Identified regulation

The regulation through identification constitutes the third important form of extrinsic motivation, which represents the more autonomous and self-determined behaviour of an individual. The consciousness of the learner becomes involved in assessing the value and worth of learning the task. After assessment of the worth of learning the task, it is owned personally by the learners, leading to increased autonomy over the learning process. For instance, if a student recognises the importance of memorising spellings for writing effectively, it may become a life goal of learners to memorise spellings due to extrinsic value attached to the task (Ryan and Deci, 2000a, 2000b; Deci, 2004).

#### 3.3.3.3. Integrated regulation

The fourth category of extrinsic motivation is integrated regulation, which reflects the most autonomous form of extrinsic motivation. Ryan and Deci (2000b, p. 62) posited that, “integration occurs when identified regulations have been fully assimilated to the self. This occurs through self-examination and bringing new regulations into congruence with one’s other values and needs”. Several proponents of SDT emphasised that internalisation of the values and worth of the task into the self is critically important for regulating the learning process autonomously. The higher the level of internalisation and assimilation of the value of the task, the higher the level of self-determined and extrinsically motivated behaviour is observed for completing the action (Deci, 2004). As the integrated regulation provides maximum autonomy to learners to regulate tasks, it shows greater similarity with intrinsic motivation (Ryan and Deci, 2000b). For example, both forms are autonomous, and lead to the acceptance of a task by the learner without any dispute regarding the value and worth of the action to be adopted. The involvement of ‘will’ and approval from the self for the execution of the action under the integrated regulation brings this form of extrinsic motivation closer to intrinsic motivation (Ryan and Deci, 2000a). However, the behaviour motivated by the integrated regulation is still controlled by the external outcomes rather than associated with the behaviour in itself (*ibid.*). The factors leading to the improvement in the integrated regulation and subsequently a greater degree of autonomous behaviour are discussed in the following section.

## 3.4. Facilitating internalisation for learning

The extent to which the values and regulations attached to learning tasks are internalised and integrated into the self leads to the betterment of learning process. Educators and researchers are more focused on the increasing internalisation of the values of courses and skills provided to students, which in turn increase the integrated regulation of the externally motivated behaviour to own and regulate the tasks (Deci, 2004; Stone et al., 2009). SDT suggests the critical role of three psychological needs in increasing the integrated regulation or highly autonomous learning process leading to the self-regulation of learning activities, which include the need for autonomy, competence and relatedness (Ryan and Deci, 2000a).

### 3.4.1. Need for autonomy

The concept of autonomy is controversial in the context of human autonomy, which is often portrayed as being ‘antagonistic to relatedness or community’. Some theorists have equated the concept of autonomy to independence and individualisation which reflects the state of isolation and limited relatedness to the surroundings. However, SDT portrayed autonomy in a different way,: for example, SDT refers to autonomy as a, “feeling of volition that can accompany any act, whether dependent or independent, collectivist or individualist” (Ryan and Deci, 2000a, p. 3). Studies have provided empirical support to the assumption of SDT: for example, Kim et al. (2007) revealed a significantly positive association between autonomy and collective learning. Similar outcomes were drawn from the research conducted by Ryan and Lunch (1989) and Ryan et al. (1994) in the context of autonomy and relatedness to parents. These studies clearly support the idea that autonomy cannot be equated with selfish behaviour, individualism or detached/independent behaviour.

Noels (2009) reaffirmed the original meaning associated with the concept of autonomy in this way: autonomy does not imply that one acts independently of environmental influences, and/or acts counter to the influence of generalised norms or the demands of specific individuals. If, upon reflection, we concur that such mandates are consistent with our values and interests, we would be acting autonomously (Noels, 2009, p. 302). The more holistic view of autonomy, supporting the self-regulated extrinsic motivation towards learning, emphasises the “sense of choice, volition, and freedom from excessive external pressure towards behaving or thinking a certain way” (Ryan and Deci, 2000a, p. 3) Therefore, autonomy facilitates the internalisation of values into the self through independent thinking and reflection over the given learning tasks. Drawing on the preceding data, it can be suggested that the student teachers might be in better position to internalise the values in their profession when the engagement in the online professional communities would stimulate a reflective process on teaching tasks.

According to Niemiec and Ryan (2009), autonomy in the context of a learning system allows the flow of freedom, and the exercise of choices and volitions in terms of accepting or rejecting academic activities through the reduction in the authoritative control over students’ choices. Zhou (2016) conducted research with 475 Chinese university students to determine the factors influencing the motivation of students to use Massive Open Online Courses (MOOCs). They used SDT and the theory of planned behaviour as a research framework. The authors revealed that any tool of coercion or existence of inflexibility and demanding evaluative pressures on students are detrimental to the growth of autonomous self-determined extrinsic motivation, which is essential for students’ productive engagement in the learning material. The previous studies have highlighted the positive impact of the teaching practices supporting autonomy on students’ perceptions of the learning and improvement in the outcomes experienced by students (Cheng et al., 2011; Dabbagh and Kistantas, 2012). The study conducted by Chirkov and Ryan (2001) demonstrated that improvement in the students’ academic performance and motivation to learn innovative concepts through classroom-based learning activities was significantly increased as a result of autonomy support from parents and teachers for students at Russian and US-based high schools.

Reeve et al. (2002) viewed that the justification and rationale for conducting academic activities are reported to be key factors, which have a convincing effect on the conscience of students, thereby increasing the autonomous self-regulated extrinsic motivation. The authors found that teachers’ explanations about the rationale and purpose of academic activities caused higher degrees of internalisation of the academic motivation among students compared to the students not receiving any meaningful rationale about the academic tasks. Furthermore, the time and efforts put forward by students to participate in the learning activities was dependent on the internalisation facilitated by the description of the importance of the learning material to students (Reeve et al., 2002). These arguments can be extrapolated to the current study involving the effect of engagement of student teachers with peers and instructors in the teaching profession can provide them with the purpose and justification of classroom-based tasks allocated to them during the training programme. Once the student teachers recognise the importance and understand their responsibilities and duties in relation to the given tasks, they may have an improved level of autonomous self-regulated extrinsic motivation.

Sierens et al. (2009) applied SDT to determine autonomy support and its impact on the self-regulated learning. They surveyed 526 students and found that teaching practices which allowed students to select the topics of discussion, plan the study activities and reflect on the learning material facilitated the internalisation of academic motivation by students. These results suggested that autonomy-supportive practices are useful for improving self-regulated learning.

Gillet et al. (2010) supported the role of autonomy support for improving the need for satisfaction and learning achievements. They further demonstrated that the students’ autonomy increases the active learning, participation in the learning activities and critical thinking among the students (Gillet et al., 2010). The confidence level can be increased by giving students freedom to choose their learning activities. However, it does not mean the withdrawal of teacher support. Several researchers emphasised that the teachers’ job is to make the learning activities interesting and appealing for students, so that self-regulated learning can be used as a tool to promote the internalisation of those values (Deci and Ryan, 2010; Vansteenkiste et al., 2006). Reeve (2009) stressed the teacher’s role as coordinator of the activities in the way that they can attract the personal interests of students. The author suggested that values of learning and personal interest can be blended in the environment characterised by psychological freedom and a sense of volition. Soenens et al. (2007) differentiated the SDT view on autonomy support from independence by arguing that volitional function is the key ingredient of autonomy, which must be fostered through embracing the differences of opinion, anger and irritations emanating from the learning process, and offering a meaningful rationale and explanations to help students select from the available learning options. The students with higher levels of autonomous support building their confidence outperform in their exams and develop the behavioural persistence needed to achieve the deep-learning objectives (Buff et al., 2011; Reeve, 2009).

In contrast, a learning environment characterised by controlling language and actions leads to poor performance outcomes in achieving learning objectives. The rewards, punishments, strict evaluative structures of learning and monitoring of students for the purpose of punishment curtails independent thinking and critical reflection, which results in sanctions on the volitional functioning of learners (Vansteenkiste et al., 2005; Deci and Moller, 2005). Niemiec and Ryan argue that:

…under such controlling conditions, however, the feelings of joy, enthusiasm, and interest that once accompanied learning are frequently replaced by experiences of anxiety, boredom and alienation. This creates a self-fulfilling prophecy so evident in many classrooms, whereby students are no longer interested in what is taught, and teachers must externally control students to make learning occur (Gillet et al., 2012).

Niemiec and Ryan (2009, p. 134)

SDT is mainly empirically tested in Western cultures where there is a predominance of individualistic norms, which leads to the notion that autonomous extrinsic motivation promulgated by the SDT might be related only to individualistic cultures. Furthermore, the utility of SDT and its dimensions are not widely applied to the learning systems in collectivist societies such as in Asian and Middle Eastern countries, which follow the traditional teacher-centred learning structure (Schneckenberg, 2008). Jones (1995) studied a case of students in Cambodia to investigate the role of self-access centres in promoting autonomy. They found that students’ upbringing, family values and school culture in collectivist societies like Cambodia were not well-poised to promote autonomy among students, although they did observe partial autonomy promoted by self-access centres in Cambodia. In contrast, Kormos and Csizer (2014) studied the autonomy among Hungarian English-language students, and found that the proactive approach of students in locating learning resources and their use of technology were important determinants of learning autonomy compared to the traditional learning methods. They determined the autonomy in terms of time management, using the learning technology and control over the learning process. These data indicate that academics and educational institutions might need to take different strategies in order to promote autonomy among students.

Some scholars are of the view that autonomous extrinsic motivation supported by satisfaction of autonomy needs might not be as important for collectivist cultures as they are in individualistic Western cultures. For example, Noels (2009) emphasised that the relevance of autonomy for developing learning might be diminished in cultures characterised by interconnectedness and respect for authority. Researchers have argued that students are more inclined to perform better under externally controlled environments in collectivistic learning systems. The application of the autonomy component of SDT in collectivist culture might not be successful in improving students’ achievements. The arguments extended by Noels might be applicable to students at the elementary and high school levels, as revealed by Chiu and Chow (2010). The authors conducted quantitative research on 193,841 15-year-old students in 41 countries, and found that countries where parents played a dominant role in their children’s learning, an improvement in academic achievement was observed. These data indicated the link between control over students and academic achievement is dependent on the cultural values and traditions of individual countries. However, adult learners such as student teachers, regardless of cultural variations, cannot be innovative in an externally controlled environment. Autonomy seems to be a prerequisite for professionals who are expected to play a leading role in teaching and education systems (Palfreyman, 2003). The authors presented data from European and developing countries, and concluded that autonomy is the fundamental right of adult learners and strongly linked with the extrinsic and intrinsic motivations to be innovative.

In light of the above discussion, it is important to empirically question the validity and relevance of supporting autonomy for learners in collectivistic cultures. Moreover, creating interest in the learning activities and offering rationales and explanations for the learning material are the key factors associated with autonomy support, which are most likely to increase the learning of students in a defined learning system.

### 3.4.2. Need for competence

SDT supports the idea that satisfaction of competence needs is required for sustainability of intrinsic and extrinsic motivations (Ryan and Deci, 2000a). Ryan and Deci (2000b) argue that internalisation of the values of increasing the autonomous extrinsic motivation is dependent on the perception of competence, which refers to the efficacy of students that they can achieve their extrinsic goals. The goals set by students to acquire special skills and knowledge hinges on the understanding of the goals, and the relevance of skills and knowledge for promotion of their employment and further education in a particular subject. Van der Blij et al. (2002, p. 43) defined competence coupled with actions, and referred to it as action competence. Hence, action competence is defined as “the ability to act within a given context in a responsible and adequate way, while integrating complex knowledge, skills and attitudes”.

Several other researchers defined competence in a similar manner as Van der Blij did (Cheng et al., 2011; Wan, 2011; Wang et al., 2010). According to Schneckenberg et al. (2011, p. 751), “the concept of action competence combines cognitive and motivational components into one holistic system of knowledge, skills and attitudes”. The learning process is put at the core of the development of competence, which is subsequently enhanced by autonomous extrinsic motivation. Therefore, Ryan and Deci (2004) have emphasised competence and autonomy together as prerequisites for the satisfaction of students’ learning needs.

The relationship of competence to the development of cognitive and mental capabilities as envisioned by SDT makes measuring competence a challenging task. Researchers have focused on action competence to measure it, as the actions are tangible, observable, and measurable (Pereira et al., 2009). In addition, competence cannot be measured as a standalone factor in any context; its assessment involves observations of roles and specific responsibilities, interactions with people, institutions and groups that build sets of skills and knowledge. Wang (2011) argued that the distinction between competencies and skills is still fuzzy in the existing literature. Competence is defined by Schneckenberg et al. (2011, p. 6) as an ability used by individuals to perform certain tasks as required by institutional demands and expectations and involving a “sufficient degree of complexity in actions and knowledge implementation”. However, the automatisation of knowledge and dispositional factors involved in performing the tasks are categorised as skills.

Clements and Cord (2013) argue that competence is applied to problem-solving practices containing higher degrees of complexity. As complex tasks are set by employers, institutions, or members of organisations, a competent individual is required to solve problems; it can be argued that autonomous extrinsic motivation lies at the heart of the demonstration of competencies in the complex environment of learning or working. The intrinsic reward associated with such a display of competence come in the form of rewards, appreciation, feedback and professional development. Within a complex working or learning system, Schneckenberg (2008) produced a model of action competence which puts learning at its core, suggesting poor development of competence stems from the absence of adequate learning support. Learning is mediated by the interplay of three key dispositions: skills, knowledge, and attitude. The demonstration of ability to mix and match the skills, knowledge, and attitudes gives rise to four key competencies including social, personal, subject matter and methodical competencies. The whole process translating competence into concrete action is driven by intrinsic motivation (Schneckenberg, 2008; Figure 3.2).

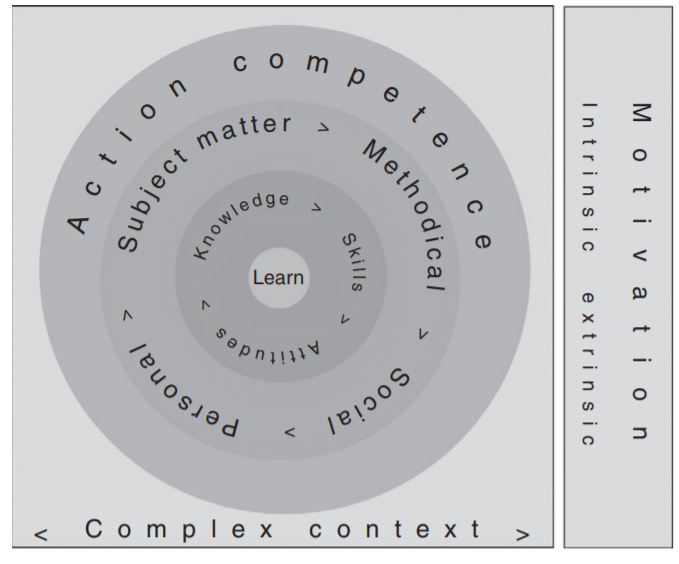


Figure 3.2: The interplay of motivation and competence affecting the learning process (Schneckenberg, 2008)

Several researchers have suggested competence-oriented learning outcomes will translate into professional competence (Abdous, 2011; Keengwe and Kidd., 2010). The long-term exercise of particular practices and continuous learning to innovate with practices are considered to be influential factors in determining the level of competence developed by teachers and students in their professional field (Dabbagh and Kitsantas, 2012; Wilson, 2014). Furthermore, one of the prominent models for developing professional competence was presented by North and Reinhadt (2003), which was later modified by Schneckenberg and Wildt (2006) to fit into the context of higher education. The adapted model showed the different stages involved in the development of professional expertise. According to Schneckenberg (2011, p. 752), “the competence development builds on practical applications of knowledge, motivation to act and the ability of students to assess their actions against defined standards, which indicate if their performance has met specified expectations”. Figure 3.3 shows the model.

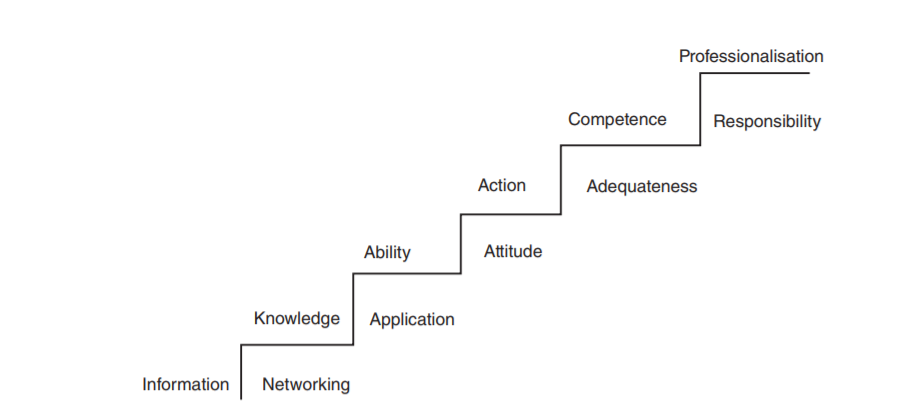


Figure 3.3: Steps leading to the development of professional competence (Schneckenberg and Wildt, 2006)

The model of competence development shown above starts with the identification and acquisition of new information which is further networked with existing knowledge in the individual’s cognitive store, peers, institutions and other sources of information in order to derive the useful meaning and conclusions. Hence, the learner’s reflection applied to the information leads to creation of new knowledge which is integrated into the self, thereby generating new capabilities in specific professional practices (Wang, 2011; Nussbaumer et al., 2015). The coincidence of learners’ capabilities with attitudes in specific learning settings leads to the expression of activities demonstrating the learners’ competence. The attitudinal factor in the model covers the systems of values of both intrinsic and extrinsic motivations. Schneckenberg et al. (2011) discovered in the context of higher education that when teachers’ actions met the ‘standards of adequateness’, it led to the acquisition of competence. The process of combining social responsibility with competence results in the process of professionalisation (Esterhuizen et al., 2013; Azeiteiro et al., 2015).

Schneckenberg et al. (2011) argued that the last three steps in the above model are difficult to achieve within a traditional learning structure; however, they can be easily managed in e-learning scenarios. This suggests that an e-learning environment supports the acquisition of professional competence through provision of all necessary steps for development of professional expertise. This is mainly due to the self-controlled and interactive environments offered by e-learning systems to learners. Schneckenberg (2008) posited that e-learning platforms provide value-laden and experience-oriented learning opportunities to learners, which are preconditioned for the development of actions, competencies and professionalisation. The institutional design of improving professional competencies is closed in nature, thereby failing to allow learners to benefit from experiences in the real world. These data justify the research question developed by the current study regarding the potential role of e-learning platforms (e.g. social media platforms) for improving student teachers’ competence. Compared to the traditional environment, Saudi student teachers can come across a variety of online opportunities for learning through engagement with peers and teachers in a blog-mediated online learning environment.

The internalisation of innovative values as a consequence of encountering unpredictable and complex scenarios is an important component for the development of professional competence (Clements and Cord, 2013). When learners face a challenging situation, they explore the existing stores of knowledge, create different patterns of existing skills and knowledge, and test to see if they can cope with the unpredictable situation successfully. This process leads to internalisation of the new values and systems as suggested by SDT (Wilson, 2014). Deci and Ryan (2008) emphasised the internalisation process as a prerequisite for competence-based learning, because of learners’ dependence on the norms, values and rules, emotional factors and motivational considerations when coming up with innovative solutions. The internalisation processes cannot be completed successfully unless the learner puts himself/herself in open situation involving episodes of anger, irritation, social interactions, problem-solving events and authenticity in the learning environment. These factors cannot be realised fully in the traditional, institutionally controlled learning environment. However, e-learning platforms provide learning situations rich with problem-oriented scenarios, allowing learners to come in to conflict with their own values, values held by others during their interaction with groups, and a variety of approaches for addressing problems (Pereira et al., 2009; Inglis and Ehlers, 2009).

The internalisation of new values for competence-oriented learning can be realised within e-learning environments, which serve as substitutes for the conventional face-to-face learning systems. Several scholars have emphasised the development of collaborative learning spaces for enabling learners to interact with each other, exchange their views, experiences and opinions with their peers. These data provide justification for the design of the current study, which aims to foster professional competence among student teachers through the creation of collaborative spaces via the development and implementation of a blogging platform.

The next section presents strategies for designing an e-learning environment for the promotion of a competence-oriented learning process.

#### 3.4.2.1. Strategies for competence-oriented learning in e-learning environment

Inglis and Ehlers (2009) conducted a content analysis of the studies outlining the differences between Web 2.0 and Web 1.0, and found that most studies reported the efficacy of the former in building the competence of students and teachers. Poikela et al. (2015) conducted a study in Finland to assess the impact of e-learning technologies in improving the working experiences of nurses during internship programmes. They applied a computer-based simulation technique and qualitative interviews as data collection tools. They found that computer-based simulation teaching created a relatively healthy influence on the training experiences of nurses. They further posited that e-learning technologies have changed the face of pedagogical practices by enabling human interaction, and if the higher educational institutions would continue to adhere to the traditional pedagogical practices, they are most likely to lose their competitive advantage due to the loss of competence among teachers. Wilson (2014) supported the views of Poikela et al. (2015), and posited that Web 2.0 technologies have changed the paradigms of learning and student-teacher interactions patterns, resulting in creating the need for the inclusion of Web 2.0 technologies in pedagogical methods and training systems for teachers.

Several authors have supported the role of cognition, reflection and situated learning in improving the professional competence of learners, and these opportunities are provided by the application of Web 2.0 technologies or social computing applications. For example, Schneckenberg et al. (2011) reviewed literature regarding the recent trends in applications of e-learning tools in building teacher competencies. They illustrated the increasing role of Web 2.0 technologies in supporting the collaborative learning environment, which resulted in competence development among students. Schneckenberg and Wildt (2006) reviewed the e-competence models for academic staff, and reported that Web 2.0 technologies allowed learning to take place in self-organised environments, wherein the learners construct knowledge, encounter experiences from different people, and synthesise new forms of knowledge. Pereira et al. (2009) and Clements and Cord (2013) linked the e-learning environment to the building of action and professional competencies. The detailed discussion on affordances of social computing applications can be found in Chapter Two, sections 2.2 and 2.6.

Schneckenberg et al. (2011, p. 754) argued that e-learning tools have attributes of “self-organization, interaction, social exchange and cooperation. These attributes provide reference points for the learning environment that actively encourage the development of learner competence”. Kolb and Kolb (2005) proposed a well-known experiential learning cycle which is useful for improving competence development and learning processes, which consists of four key phases: concrete experience, reflective observation, abstract conceptualisation, and active experimentation (Figure 3.4).

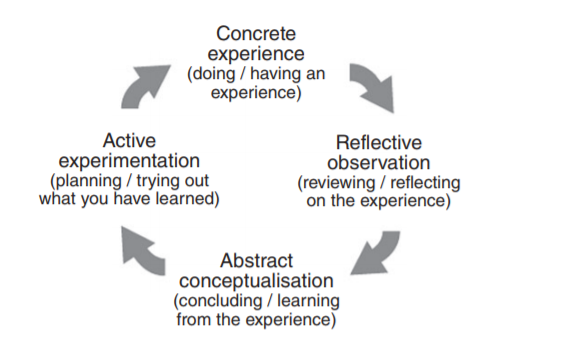


Figure 3.4: Kolb’s cycle for development of competence (Kolb and Kolb, 2005)

Schneckenberg et al. (2011) reflect that concrete experience in Figure 3.4 is related to accomplishing tasks and gaining experience, selecting practical work to gain experience then translating practical experiences into the theoretical content of the coursework. This gives them sound experiences coupled with the development of reflective abilities. In traditional teaching and learning systems, teachers are placed in the centre of the learning system instead of students, which does not adequately lead the latter to gain experiences leading to reflection and professional development (Wang, 2011). This notion is supported by Schon’s model of reflection (Schon, 1986) which suggests that it is paramount that learners should identify and define the problems, try to solve the issues on their own, and reflect on what has been achieved. These processes lead to effective learning leading to the development of competence.

Wang et al. (2011) developed the prototype system for a Web 2.0 e-learning platform, and evaluated its role in increasing social interaction among teachers. They found that Web 2.0 technologies were quite useful in providing solutions in an open-learning context to support the foregoing processes, such as identification of issues and communicating the issues with peers and teachers in order to find solutions. They also enabled users to make autonomous decisions regarding the choices of the best solution or sources of information in situations full of uncertainties. For example, Carril et al. (2013) surveyed 166 faculty participants to identify the training needs for professional competencies, and found that teachers value e-learning tools in building their competencies in terms of assessment and content-drafting. They showed willingness to post different learning options in form of videos, audios, books, links to databases, journal articles, news feeds and blogs. They identified the material, made choices, reflected on the utility of contents, and synthesised new knowledge out of the previously posted knowledge. These events play a critical role in the development of reflection and competence of students in solving problems and making decisions in situations of varying complexity (*ibid.*).

Wan et al. (2008) examined the impact of Web 2.0 learning tools including the use of social media applications on the learning experiences of Malaysian university students studying English as a second language. They used a self-reported survey with 400 students, and reported that reflection was a key factor in promoting competency development, and this was supported by various social computing (Web 2.0) tools such as e-portfolios, blogs, and learning diaries, which allowed the students to engage in writing assignment/articles which further stimulated the critical thinking and reflection among students. Schneckenberg et al. (2011) surveyed literature in the area of e-learning tools and professional competencies, and found that the theoretical course contents were offered to develop theories, hypotheses and questions which could further be tested in the active experimentation phase of the reflective model (active experimentation phase).

Taken together, social computing applications are viable solutions for the satisfaction of students’ competence needs, which subsequently results in increasing autonomous extrinsic motivation to participate in the learning activities arranged via social computing platforms. Social computing helps identify, define and synthesise new strands of knowledge, and the assimilation of such knowledge leads to development of integrated regulations with a higher order of autonomy in actions and thoughts. In the presence of the required level of competencies as developed by learners within the e-learning environment, the autonomous extrinsic and intrinsic motivations are sustained for continuous engagement in the learning process.

The element of autonomous extrinsic regulation is useful for the current research project, which aims to develop the professional competence of student teachers through internalisation of values, experiences and opinions shared on social computing platforms. Based on learning models of Kolbe and Kolbe (2005) and Schneckenberg and Wildt (2006), social computing applications can be used to fulfil the needs for competence among student teachers by facilitating the internalisation of knowledge and experiences, through which SDT-proposed autonomous extrinsic motivation and extrinsic motivation can be sustained. Hence, I hypothesise that social computing applications can proffer a useful solution in increasing the professional competence of student teachers, and through the satisfaction of student teachers’ competence needs, they can adhere to the usage of such applications for development of new knowledge and skills.

### 3.4.3. Need for relatedness

According to SDT, the activities and tasks organised by external actors may or may not stimulate the externally motivated behaviours in terms of the levels of interest, fun, and recognition offered by such activities to learners (Deci and Ryan, 2004). The primary reason which leads the learners to become engaged in such behaviours is to gain connection with others, and obtain appreciation from peers, family members or society. If the engagement in externally organised tasks gives learners a sense of belonging and connectivity with their surroundings, autonomous extrinsic motivation will increase as the sense of belonging grows (Niemiec and Ryan, 2009; Deci and Ryan, 2010). Ryan and Deci (2000b, p. 64) posited that “groundwork for facilitating internalization is providing a sense of belonging and connectedness to the person, group, or culture disseminating a goal, what in SDT we call a sense of relatedness’. For example, if a learner receives respect, positive feedback and recognition from teachers for the efforts and hard work put in acquiring knowledge and skills, the willingness to engage in classroom-based activities can be increased and vice versa. In line with this proposition of SDT, Ryan et al. (2009) found that internalisation of the behavioural regulations within a school is positively associated with the sense of belonging with parents and teachers.

La Guardia and Patrick (2008) and Reis (2011) shared these views on human relatedness in relation to motivation, and argued that it is an intrinsic need for people to stay connected with others and to construct a meaningful relationship with peers and family members. All situations do not lead to the creation of a sense of relatedness. In certain situations, people might feel connected, cared for, and their efforts acknowledged; however, in other scenarios, they might feel isolated, frustrated, abused or misunderstood. The former situation leads to the development of relatedness, while the latter scenario weakens the sense of relatedness among individuals. Lavigne et al. (2007) supported the theory of relatedness proffered by SDT by positing that feeling cared for and caring for others, together with social acceptance, are important attributes of relatedness. There is some controversy concerning the intrinsic nature of the psychological need for relatedness. Some psychological theorists suggest that it is instrumental in nature because people have associated with each other for their own personal motives (Freud, 1925; Thibaut and Kelley, 1978) or physical security (Bowlby, 1969), while SDT supports the view of the adaptive and intrinsic character of relatedness in human nature (Deci and Ryan, 2000a).

SDT argues that presence of relatedness is critically important for fostering positive relationships and the wellbeing of individuals (Deci and Ryan, 2008). The impact of relatedness on learning from family members such as the mother and father is explained by attachment theory, while the proposition of the motivation to learn from relationships is derived from relationships motivation theory, which is utilised by SDT in the development of hypotheses relating to the satisfaction of psychological needs triggering motivation within an individual to perform certain tasks (Deci and Ryan, 2004; 2014). SDT also emphasises how the satisfaction of needs for autonomy and competence within relationships can cause relationships to flourish. The same proposition is true in the relationships between mentor and mentee (Deci and Ryan, 2014). Students can perform better in an environment which is supported by a teacher through provision of adequate levels of autonomy, recognition of work, and connectedness. In such a learning environment, positive learning achievements and the fulfilment of learning objectives were reported in many studies (Niemiec and Ryan, 2009).

In the traditional learning environment, a sense of relatedness is fostered through a student’s connections with peers, and with teachers through face-to-face communications and interactions within the classroom (Vaughan, 2014). Words of appreciation and positive feedback about the students’ work, acknowledgement of learners’ contributions towards achieving learning outcomes and rewards all contribute to the relatedness in the physical learning environment (Shackelford and Maxwell, 2012). The collective assignments and group structure set up to achieve learning objectives also foster the sense of relatedness with peers and teachers and with the learning material (Banerjee, 2011).

In a virtual learning environment, the building of communities of practice gathers people with similar interests together and connects them to work on knowledge-building projects. The relatedness of learners with the virtual learning environment is explained by the theory of communities of practice and social learning theory (Yilmaz, 2017). The community of practice is the advanced form of social learning theory, which was originally proposed by Wenger and Lave (Smith, 2003). Collaboration and interactions are the two key attributes of learning within a community of learners sharing the same or similar professional interests, which is realised in the virtual learning environment constructed by social computing applications. Hence, the community of practice is defined in terms of a “broader framework of thinking about learning in its social dimensions. It is a perspective that locates learning, not in the head or outside it, but in the relationship between the person and the world” (Wenger, 2010, p. 1).

Therefore, the need for relatedness can be satisfied effectively within the model of the community of practice, which is built with the incorporation of a sense of community among learners by bringing the learners close to each other and to their learning environment (Henderson, 2007; Anderson, 2004). The learners engage in social contexts through conversations, feedback, reflective activities, and some abstract and physical artefacts such as methods, concepts, links to resources, personal accounts and documents. Wenger (2010) emphasised engagement, participation and reification – reflecting that shared experiences are the key hallmarks of the community of practice, which facilitates the relatedness needs of learners. The internalisation of the values and rules associated to externally managed learning systems can be facilitated through enhancing the three aforementioned elements of the community of practice, as suggested by Wenger.

The physical learning world restricts the engagement, collaborations and repetitive interactions due to spatial and temporal restrictions, which can impact on the pace of development of communities of practice (Cavanaugh et al., 2009; Akyol and Garrison, 2011). However, the virtual learning environment lifts such restrictions and proffers limitless opportunities to interact in one-to-one or one-to-many interaction events in the virtual learning environment (Kop and Hill, 2008). Such an environment of learning facilitates the exposure of realities from different angles, which plays an important role in the internalisation of externally imposed rules, thereby resulting in autonomous extrinsic motivation. Learners adopt external elements or values in the social learning environment as they are created by them and shared with others in the learning environment (Dabbagh, 2007; Shea and Bidjerano, 2009).

The appreciation and recognition obtained from shared experiences and user-generated content enhance the sense of unique social identity within the community of practice, which carries a higher degree of autonomous extrinsic motivation in its own right due to representing the learner as a social participant, a meaningful and cognitive entity contributing to the resources of the virtual social world (Faraj et al., 2018). Hence, the sense of community deepens the sense of relatedness for the people within the same community of practice. The ultimate objective of the community of practice is to create a sense of relatedness which gives rise to an increase in autonomous extrinsic motivation (Kop and Hill, 2008; Williams et al., 2011). The whole experience of belonging to society and communities reflects ‘learning as a social making’, creates ‘dynamism’ within the learning process, enables ‘modulation of knowledgeability’, and generates ‘tension between competence and experience’ (Wenger, 2010).

Li et al. (2009) described three key components of the community of practice within a virtual learning environment including the domain, the community, and practice. These components foster the senses of community and belonging to the learning environment and the members’ sense of affiliation to the learning system. The domain component refers to the virtual environment in which student-student and teacher-student interactions take place through unregulated participation (Wenger, 2011). The community component interacts with the domain component of the online learning environment, and this satisfies the need for communication in a reiterative format in order to build the sense of belonging in the learning environment and to the entities in the learning system such as the teachers and courses. The practice, a third component of the virtual environment, prospers as a result of interaction between the domain and community components. The practice reflects the outcomes in the form of learning, construction of new knowledge and skills, and professional development (Wenger, 2010 ;2011).

In summary, relatedness is an important dimension of SDT, which holds a key role in revealing the impact of social computing technologies on the learning and skills development of students. In the online learning environment, relatedness to the learning system and all components within it are prerequisite for gaining success in implementing the social computing projects. The next section will present the evaluation model for assessing the impact of social computing technologies on the skills and learning of students.

## 3.5. Building a Model for the Proposed Blogging Platform

This section presents a model for the blogging platform used in the study. This model was used to explore the impact of the proposed blogging platform on students’ learning and self-determination in the post-implementation scenario. The model was developed from a review of the literature on effective construction of blogs, and the extent to which features adhered to the principles of SDT. In the following sections, the five components of the model are explained.

### 3.5.1. Impact of perceived ease of use on learner satisfaction

Communication and accessibility are two key factors which reportedly increase the usefulness of learning gathered from the use of social computing applications. Different studies have reported communication and ease of accessibility as the main factors enabling the positive perception of the usefulness of knowledge and the sharing of it within members of the community of practice in the virtual learning environment (Ifinedo, 2017; Yang et al., 2016). The clarity of information should be supported by the technological environment in order to allow the smooth flow of information, the correct interpretation of meanings, and the fostering of knowledge between members.

In addition, accessibility of information is another key characteristic of the technological domain in the community of practice, which enables users to create their profiles and generate their identities through access to the content-creation parts of the domain. Various scholars are of the view that the sense of belonging diminishes during events of restricted or controlled access to the content located in e-learning tools domain, such as the social computing platforms (Ifinedo, 2017; Yang et al., 2016). Al-Jeraisy et al. (2015) showed that communication had a positive impact involving the exchange of knowledge, discussions and interactions about the satisfaction of the learners using social computing applications. Other studies by Shih et al. (2011, 2013) showed similar findings by revealing the positive impact of Facebook-assisted communication on student satisfaction with learning in their Business Communication English class. Effective communication between users leads to an effective learning process, which has been shown to produce a positive effect on students’ performances.

### 3.5.2. Impact of compatibility on learner satisfaction

Scholars have argued that technological features should be compatible with the needs of users, as they increase the sense of relatedness learners feel with the learning environment (Hsu et al., 2008; Chu et al., 2012). Subsequently, internalisation of rules and values associated with the learning environment shows a positive impact on autonomous extrinsic motivations. For example, social computing tools designed for learning can attract the attention of learners when they fulfil the communication needs using different formats such as video, audio, hyperlinks to resources, and the option to create the content. The interactive environment which facilitates dynamic communication, reading, uploading posts, replying to posts, the ease of revision and interesting material contributes to an increase in the learning satisfaction of students (Shih, 2010). Halic et al. (2010) reported that undergraduate students’ learning satisfaction was significantly increased due to the interactive features and archiving properties of blogs. Glogoff (2003) found that weblog features such as the chronological order of posts, access to past strands of communication, and support from the teachers were the important predictors of the students’ satisfaction level with blog platforms as learning tools. These data indicate that the compatibility of blog features, in relation to structure and layout, with the needs of students affects the learning satisfaction of students.

### 3.5.3. Impact of enjoyment and usefulness on the learner satisfaction

Enjoyment and usefulness are the reported predictors of learner satisfaction with using the social computing applications for learning purposes. Joo et al. (2017) investigated the impact on learners, finding the extent to which learning technologies are useful and enjoyable are related to the level of the satisfaction with learning technologies. They revealed that perceived enjoyment and perceived usefulness significantly increased learner satisfaction and subsequently enhanced the intent to continue to use digital textbooks. Wang et al. (2010) reported that perceived enjoyment increased as a result of the extraversion and agreeableness of blogs in their study, which increased the student satisfaction and their intent to blog. Ifinedo (2017a, 2017b) demonstrated that perceived usefulness and enjoyment highly increased student satisfaction with the use of blogs for learning purpose. Many other studies reported similar findings, showing the positive impact of perceived enjoyability and usefulness of blogs on the intention to use them and satisfaction of learners.

### 3.5.4. Impact of satisfaction on learner skills and knowledge

Several studies have reported the association between learner satisfaction with social computing applications and the improvement in students’ learning and development (Top, 2012; Joo et al., 2017; Ellison and Wu, 2008). The students who are more satisfied with the social computing applications are inclined to continue the use of such applications, which leads to the further enhancement of knowledge and the maturity of their skills (Cakir, 2013; Banerjee, 2011). Ellison and Wu (2008) reported the positive impact of the use of blogs on the development of comprehension skills of students of English as a second language. Shiau and Luo (2013) found that students who enjoyed the blogging applications spent more time communicating with peers and were highly satisfied with the applications, as well as showing improvement in communication skills. Goldman et al. (2008) introduced seminar blogs for enhancing student participation in school public health classes; they found that seminar blogs enhanced participation in classes, which led to students performing better in the class. Vaughan (2014) argued that student engagement in blogging technologies helps increase student learning, academic achievement and satisfaction.

### 3.5.5. Impact of sense of community on learner satisfaction

As described in section 3.5.3, a sense of community arises from the dimension of relatedness in SDT. Continuous interactions with peers and collaboration between members with same or similar interests on social computing applications leads to a sense of community and the establishment of communities of practice. The members of the community respect each other, recognising the contributions from leading members of the community of practice. Zhang et al. (2014) showed the positive impact of peer feedback and collaboration in motivating learners to become part of a community of practice. The sense of community was significantly enhanced through the information-sharing behaviour of blog users. They revealed the positive association between the sense of community and learner satisfaction with the knowledge and skills acquired through blog-assisted interactivity between peers (Lu et al., 2010). Glogoff (2003) reached a similar conclusion by showing that students experienced the sense of community while interacting with peers on blogs, which increased the student satisfaction with learning on an online course. Chung and Nah (2009) determined a link between the sense of community and satisfaction of readers in online community newspapers. They found the users’ perceived satisfaction was increased as a result of improving the sense of community among the users. Several other studies revealed that sense of community is positively associated with learner satisfaction in different educational systems (Exter et al., 2009; Yang et al., 2016; Shackelford et al., 2012).

## 3.6. Summary

This chapter has discussed the theoretical framework, which forms the basis of this study. SDT was chosen as the theoretical framework because of its value in determing the impact of the study on students’ overall learning and development. Intrinsic and extrinsic motivations were discussed as part of SDT, which determines the intention of students to engage in the learning process. Several studies discussed in this chapter revealed the effectiveness of SDT in the education context. Autonomy, competency and relatedness were found to be facilitating factors for increasing the intrinsic and extrinsic motivations, which result in persistence and better performance of students. The chapter then moved on to consider five key elements of blogs which have been found to support learning and self-determination. In the next chapter, I outline the methodological framework for the study, consider the research paradigm underpinning it, discuss the data collection tools and consider approached to data analysis.

# CHAPTER FOUR

# RESEARCH METHODOLOGY

## 4.1. Introduction

This chapter presents the components of the research design used to conduct this study. The first section illustrates the aims and research questions. The research design’s components such as the paradigms are outlined, followed by a discussion of mixed methods research and the justifications for choosing mixed methods research for this study. The sampling strategy and data collection instruments used are explicated, before a section outlining the tools for analysing the qualitative and quantitative data is presented. The final section of the chapter considers the ethical aspects of the study.

## 4.2. Aims and Research Questions

Novakovich (2016) developed blogging software to improve literacy among students studying English as a second language using the semi-quasi-experimental research design, and found that their writing skill was significantly increased as a result of the use of the educational blog. Another study carried out by Farrand et al. (2010) used focus group methodology to show the impact of a reflective blog on the reflective ability of students under training programmes. They revealed a significant relationship between the increased use of reflective techniques and the higher frequency of reflective blog usage. These studies have provided evidence about the role of blogging in increasing the learning and skills of students. However, due to small number of participants, which is the usually case with experimental studies, the outcomes of the study could not be generalised to students in different learning and training contexts. This warrants the carrying-out of context-specific research to support the potential role of blogs in improving the training outcomes for teachers.

This study examined the potential value of ST-Edublog as a learning tool in assisting the learning and development of student teachers in Saudi Arabia. This study also aimed to determine the factors facilitating the use of the proposed ST-Edublog for Saudi student teachers, especially during the training phase of their teaching education, in order to inform future practice. I embarked upon the exploration of the implications of blogging platforms in the education and training systems of Saudi Arabia for student teachers, as I hypothesised a correlation between the use of blogging technology as a learning tool and improvements in the professional development of student teachers, based on my understanding derived from the literature in Chapters Two and Three.

I worked as an instructor of student teachers and came to know the predominance of traditional teacher training systems at the earliest stage of their career. In Chapter One, it was discussed that students in Saudi Arabia are dependent on technology for communication with each other, which was evident from the usage patterns of social applications for communicating with peers. Based on my understanding of the literature discussed in Chapter Two, section 2.6, I hypothesised that social computing applications support learning and pedagogical affordances to students in their learning. It would appear that traditional methods can thwart the learning process due to the changing patterns of millennial learners.

Hemmi et al. (2009) suggested that empirical research showing the impact of blogging in different disciplines of knowledge is scant. There is well-established evidence showing different social computing applications increasing the performance of students in the domain of teaching English as a second language in Saudi Arabia, which shows the potential of such applications in other disciplines. Robertson (2011) argued that there is a need to empirically examine the impact on learning in different social contexts in order to gain an insight into the practicability of social computing tools as learning tools within education and training institutions and systems. Practicability is a focus of this study because of the emphasis placed by the government in Vision 2030 on integrating learning technologies into the training and learning systems at educational institutions. Nurrunnabi et al. (2017) suggested that the policy-makers at the Ministry of Education aim to enhance the learning experience and academic achievement of students through engagement in learning technologies during their studies.

Williams and Jacobs (2004) asserted that social computing tools cannot satisfy the learning needs of the students unless they are designed in accordance with the learners’ needs. Most social computing applications have not been researched in terms of their potential to increase the autonomy, confidence and competence of students. This is the result of teachers’ belief in traditional methods and the lack of convincing arguments about the utility of such applications in learning systems (Churchill, 2009; Wheeler, 2010). Teachers’ attitudes and institutional policies towards the adoption of social computing platforms as learning instruments cannot be changed unless and until solid and reliable empirical evidence has been generated to demonstrate the role of social computing applications in developing the knowledge and skills of teachers (Kori et al., 2014; Lee and Bonk, 2016).

In order to explore these issues in my own context, the overarching research question of this study was, “How successful is the use of blogging technology as a tool for developing the learning, skills and self-determination of student teachers in Saudi Arabia?” To address this overarching question, the following subsidiary research questions were designed:

1. What perceptions do a group of Saudi student teachers have of blogging technology in comparison to other social computing applications (e.g. Facebook, Twitter, Snapchat)?

This question was designed to explore how far the blog would be of value in my quest to enhance the knowledge and skills of student teachers. This question was investigated prior to the implemention of the ST-Edublogging project.

1. How did Saudi student teachers perceive the ease of use, usefulness, compatibility, enjoyability and interactive elements of the blog used in the ST-Edublog project?

This question aimed to explore the responses of the students to the five key elements of the blog, which were designed based on the identified features of successful blogs to support self-determination in the previous chapter.

1. What impact did the blog have on student teachers’ development of skills and knowledge?

This question aimed to examine how far the students felt the blog had enhanced their skills and knowledge. This related both to their general skills, such as writing skills, and their knowledge of classroom theory and practice.

1. What impact did the blog have on the three key elements of self-determination – autonomy, competence and relatedness - of student teachers?

This question enabled an in-depth analysis of the blog’s impact on the skills and knowledge of the students, as enhancement of self-determination has been found to be positively related to improved skills and knowledge (Ryan and Deci, 2000). This theoretical framework offers an explanatory model for the impact of the blog project on the student participants.

## 4.3. Research Design

Blanche et al. (2006) stated that research design is constructed with the consideration of four key factors: the problems to be addressed by the study; the social context of the study; philosophical paradigms informing the research direction; and the data collection and data analysis tools for the research project. The context of the study and research questions are explained in sections 1.2 and 1.3 in Chapter One. The philosophical paradigms and data collection and data analysis tools are outlined in the rest of this chapter.

### 4.3.1. Paradigm

Once the research questions are finalised by a researcher, the next logical step is to find a suitable method to answer the questions. The approach the researcher assumes might solve the research issue depends on the nature of the problem under investigation and the systems of beliefs held by him/her within a certain discipline (Thomas, 2011; Robson, 2011). Schwandt (2014, p. 183) defined the paradigm as a “shared worldview that represents the beliefs and values in a discipline and that guides how problems are solved”.

A paradigm contains four major components including the “ontology, epistemology, axiology, and methodology” (Scotland, 2012; Chilisa and Kawulich, 2012). Ontology is the aspect of the paradigm which considers the exploration of truth and construction of knowledge behind any research activity and addresses the questions of what constitutes the truth. The ontological position of a researcher enables him/her to reveal their positions regarding the assumption of reality and understanding of truth within a particular social phenomenon (Taylor et al., 2015). The ontology is also concerned with whether there is one or multiple verifiable realities, especially in a domain of constructed knowledge. The epistemological assumptions allow researchers to raise the following questions: “What are the sources of knowledge? How reliable are these sources? What can one know? What can one know? How does one know if something is true?” (Chilisa and Kawulich, 2012, p. 51). For example, in my study, the epistemological assumptions lead me to raise the following questions: what is the value of blogging technology in developing the skills and learning of student teachers?

Cohen et al. (2013) asserted that beliefs and values are created as a result of social interaction of different factors and actors with each other. As such interactions are complicated, this gives rise to different forms of reality. However, all these realities have different magnitudes in terms of affecting the social process; therefore, the ontological aspect of the paradigm helps researchers to prioritise the socially constructed realities and knowledge, thereby initiating the process of setting the research questions to investigate the solutions of complex social phenomena (Teddlie and Tashakkori, 2009). In line with the arguments of Teddlie and Tashakkori (2009), I had considered the social realities surrounding training programmes of student teachers and raised the research questions accordingly.

From the perspective of knowledge/realities as socially constructed entities, the perceptions and interpretations of these realities might vary from one person to another, depending on the various mental constructions and perceptions of reality (Dooley, 1995). Hence, the concept of reality held by the researcher at the beginning of the process might come in conflict with that discovered at the end of the research process, or the research outcomes might stand in conflict with those of other researchers (Bryman, 2016). This also highlights the fact that a researcher’s interpretation of data might change as a result of discovering new patterns in the acquired data, leading to construction, deconstruction and reconstruction of knowledge at different stages of the process (Mertens, 2015). From the development of research proposal stage to the interpretation of the data, I constructed and deconstructed my knowledge about the use of social media in the educational context. For example, I learnt that all social media were not equally useful in the context of Saudi education and training systems. This allowed me to focus on the social media platform with most relevance to Saudi students.

Therefore, constructivists should be cautious when using their claims based on the concept of a single objective reality to reject multiple forms of realities resulting from the different perceptions of participants in research activities (Bickman and Rog, 2008). It was emphasised by Frankfort-Nachmias and Nachmias (2007) that cultural, historical and experiential accounts of participants reveal different interpretations and understandings of the data, which should be considered while constructing realties from those data. This argument applies to my research as social media use and its benefits can be shown through the experiential accounts of participants. Therefore, it is assumed that an experimental research design with history of use of social media will provide a better assessment of the value of educational blogs for training programmes for Saudi student teachers.

As this study aims to explore the perceptions of student teachers about the use of student teacher Edublog (ST-Edublog) in Saudi Arabia, the multiple views and orientations of participants regarding the potential value of ST-Edublog might be expected based on the socially constructed nature of participants’ knowledge about Edublogs in Saudi Arabia (see details in section 1.2). The perceptions of participants about the application of ST-Edublog in my study could be impacted by several factors based on cultural backgrounds, interests, and previous experiences with and exposure to online learning, which is why it is appropriate to the use the term ‘socially constructed’ knowledge in reference to Edublogs. Moreover, the attitudes and beliefs of the student teachers participating in this study could be affected by the perceptions of peers and teachers of the utility of Edublogs for improving professional development. I was able to gain an understanding of the cultural and historical backgrounds of the participants in Saudi Arabia, which was important for collecting and interpreting the data successfully as a collectivist researcher (Creswell, 2003).

Epistemology is related to the understanding of different forms of truth and knowledge (Cohen et al., 2007), and is concerned with the creation/acquisition and communication of knowledge. Guba and Lincoln (1994) explained that epistemological position helps foster understanding of the relationship between the researcher and the social phenomenon being investigated. The epistemological assumptions allow researchers to raise the following questions: “Is a belief true knowledge? Or is knowledge only that which can be proven using concrete data?” (Chilisa and Kawulich, 2012, p. 51). According to Dunne et al (2005, p, 14), epistemology is related to the, “nature of our claims to know things about ourselves and the world and how to justify those claims”. I agree with Dunne et al. (2005), and consider that the construction of knowledge should be undertaken by considering the cultural and historical background of the phenomenon being researched. Being a national of Saudi Arabia with all the background knowledge of the users’ requirements, I was able to figure out the basic structure and layout of the necessary components in ST-Edublog. In addition, I immersed myself in the blogging environment in order to grasp the behaviour of participants towards the application of the blogging environment for developing knowledge and skills. I have posed different questions and considered the perspectives of what I have learnt about blogging technology to draw an objective picture of the perceptions and attitudes of participants towards blogging platforms.

Axiology represents the system of ethical values and beliefs which are used to acquire and communicate the truth, and reflect the researcher’s beliefs about realities with reference to a specific social and political creed of the society to which the researcher belongs. The ethical system of beliefs determines the boundaries of the research questions (Grix, 2004). For example, in religious societies, questions about the presence of gods cannot be raised. Similarly, the values cherished by researchers also affect the way the outcomes of the research can be interpreted. Hence, it can be argued that axiology is concerned with ethical beliefs and values which affect the research process at all stages, ranging from formulating the research questions to the reporting of the results of the study (Cohen et al., 2007; Creswell, 2009). Based on suggestions by Cohen et al. (2007) and Creswell (2009), I followed the ethical considerations from the stage of participant recruitment through data analysis to the presentation of findings from this study.

Methodology springs from the ontological, epistemological and axiological beliefs of the researchers. Wellington and Szczerbinski (2003) defined methodology as an “activity or business of choosing, reflecting upon, evaluating and justifying the methods you see”. They further argued that methodology intends to, “describe and analyse methods, throwing light on their limitations and resources, clarifying their suppositions and consequences, relating their potentialities to the twilight zone at the frontiers of knowledge” (p. 33).

Hence, it can be argued that methodology provides guidelines about the sampling strategy, considerations for ethical perspectives to deal with participants, the ways of collecting data and the methods employed to analyse them. According to Creswell and Clarke (2017), the prime concern for any research project is to devise the research questions, followed by selection and justification of methods to address the pertinent research questions. Furthermore, the research project may assume an explanatory, descriptive or exploratory approach to generating insight into the research issues as experienced by the participants of the study (Creswell, 2009). I decided to use the exploratory approach for this study, as it was found useful in answering the research questions.

I employed the mixed methods approach, which involves using both qualitative and quantitative research methods to address the research issue. Moreover, the mixed methods approach provided me with an in-depth insight into the views, perceptions and experiences of participants about the ST-Edublog environment, and its utility in the learning system currently employed for participants in Saudi Arabia. Moreover, the factors affecting use, such as factors facilitating or disabling the use of blogging technology in Saudi Arabia were also obtained through the exploratory approach.

I decided to employ more than one paradigm, as it can be helpful in answering research questions. There are two important research paradigms including positivist and interpretivist paradigms. For some scholars, positivist paradigms are known for their objective quality, free of any values sponsored by researchers, and presenting an objective picture independent of the influence of the researcher’s own perceptions of social phenomena (Williams, 2007). However, Cohen et al. (2007) argue that the positivist paradigm is subject to criticism by different researchers, including artists, creative researchers, and social scientists, who espouse that knowledge is a ‘socially constructed’ reality. The reasons for this criticism can be attributed to three key arguments: the lack of fully objective and value-free social issues, the difficulty of determining the relationship between cause and effect due to the complexities of social problems, and the uncontrolled nature of variables affecting the social processes (Newman, 2007).

The qualitative paradigm, according to Creswell (2011), focuses on the qualitative aspects of the issues in order to develop a sound understanding of the individual experiences and actions leading to meaningful behaviour within a subjective world. In contrast to the positivist paradigm, the interpretivist paradigm deals with the subjective world where experiences are more dynamic and support the assumption of multiple realities rather than one single objective reality, exploring the effects of multiple factors on the existence of social phenomenon rather than simply discovering a cause-and-effect relationship as intended by the positivists (Creswell et al., 2003). In addition, the positivist starts with the development and testing of hypotheses during the research process, while the interpretivist builds the theory as a result of the available data pertaining to the behaviours and experiences of the participants. In other words, the theory precedes the positivistic research process, while it follows the interpretivist research process (Tashakkori and Creswell, 2007). I built and tested hypotheses about the role of blogs in developing the skills and knowledge of student teachers, so in that sense could be seen as a positivist, however, I was able to build a theory about the attitude and behaviour of student teachers towards blogs using qualitative data, from an interprevist standpoint.

In that sense, my research study could be seen as being related to pragmatism. This is another research paradigm which enables the use of as many research approaches as possible to address the research questions, rather than adhering to positivist or interpretivist paradigms to find solutions of the complex social issues (Denscombe, 2008; Creswell and Garrett, 2008). Pragmatics espouse the mixed methods research approach, which can benefit from both qualitative and quantitative paradigms depending on the requirements of the research questions. Hence, the mixed methods research develops both hypotheses in the beginning in order to test them, forming the theories at the end of the research questions by combining the outcomes from qualitative and quantitative data sets (Hussein, 2009; Bergman, 2008). Miller and Salkind (2002) argued that mixed methods research is more useful in addressing research issues dealing with people’s experiences and behaviours towards the educational tools developed for innovating the existing educational structure. Furthermore, mixed methods research favours the use of a reflexive and critical approach towards finding the solution of a problem and triangulates the research methods to find the best possible solutions. Algahtani (2011) emphasised that the triangulation of qualitative and quantitative research methods allows researchers to offset the limitations associated with either qualitative or quantitative research methods by:

…accepting the limitations of a realist perspective of the world by maintaining that such knowledge is provisional and revisable, but nevertheless, seeking to establish as consistent a picture as is possible with available tools.

(Algahtani, 2011, pp. 105-106).

The current research project deals with complex social phenomena involving the behaviours and perceptions of participants towards educational blogging technology, which cannot be realised unless I use a reflective and critical approach in which I can draw on as many methods as required to create a consistent solution to the research issue. I can exercise this level of flexibility and reflective approach with the use of mixed methods, which favours the use of a range of tools to address the research issues. Therefore, I employ the mixed methods approach in order to generate a detailed and balanced view of the participants about the use of ST-Edublog in Saudi Arabia.

In summary, the paradigmatic aspects of the research are used to identify the framework of assumptions, beliefs, the researcher’s position on the nature of the problem, and the methodology suitable for investigating the research issue, and methods which can be justified to address the research questions. As all assumptions relating to the paradigms exist in conjecture, therefore, they cannot be proven or disproved, empirically (Scotland, 2012). The assumptions, values and beliefs which are concerned with paradigmatic aspects of the research activity are inherently located in the research framework, triggering the research process, which suggests that they might vary from one researcher to another (Tashakkori and Teddlie, 2010). This is evident from the variations in research methodology or methods adopted to address various research problems. Furthermore, the ontological, epistemological and axiological assumptions, though existing in abstract, serve as a catalyst for designing research questions, and choosing and justifying the research methods adopted to address them. I was able to select and use the mixed methods action research. The next section will discuss action research and mixed methods action research.

### 4.3.2. Action research

In the beginning of the twenty-first century, educationists and researchers introduced the cross-disciplinary methodology which was intended to explore the issue of practical practices in education with a focus on improving the educational process, action research refers to:

…a participatory process concerned with developing practical knowing in the pursuit of worthwhile human purposes. It seeks to bring together action, reflection, theory and practice, in participation with others, in the pursuit of practical solutions to issues of pressing concern to people.

I have identified the issue relating to the knowledge and skills development of student teachers through the application of traditional class-based learning methods during training programmes in Saudi Arabia. This study aims to improve the learning and skills development of student teachers in Saudi Arabia by developing and implementing blogging technology; therefore, action research is deemed fit to address the issue of training student teachers effectively, which is a concern of pressing importance for myself and educational institutions delivering training programmes. According to Herr and Anderson (2005), action research is used to introduce social change through empowering and emancipating the people concerned. This research focuses on social change from the traditional learning styles to the online learning mode for student teachers receiving training at the university in Saudi Arabia examined in the study. Online learning via social media platforms empowers learners and teachers. Hence, the current research study not only promotes the empowerment of learners but also increases the level of emancipation during learning by looking at the acquisition of skills beyond the classroom-based environment.

Action research is cyclical process involving the following four stages:

***Reflection***: The researcher reflects on the problems encountered in the classroom and tries to come up with the solution. This is usually achieved based on real issues faced by teachers in the classroom when delivering knowledge or managing the class.

***Reconnaissance***: This is also called the fact-finding stage, which involves the planning of the proposed solution based on the reflection in the previous stage.

***Action***: Based on the facts identified in the reconnaissance phase, the proposed solution is developed and implemented in the real-time environment of the class.

***Evaluation***: This stage includes observations of the consequences or ramifications of the implemented solution.

In the context of the current study, as an instructor of student teachers, I reflected on the issues faced by student teachers during training in terms of acquisition of practical knowledge and skills development, and I came up with different solutions based on the use of social media platforms for improving the skills development of student teachers in the examined university in Saudi Arabia. Following this, I conducted the reconnaissance phase and found the relative values of different social media platforms for student teachers. Based on the outcomes of the reconnaissance phase, I developed the proposed solution, which constituted the action phase of the action research followed by evaluation of the implemented solution. Action research design is useful in the sense of offering flexibility to the researcher to select the research method for each phase. Several researchers have supported the use of qualitative interviews and literature review strategies in order to find the facts and determine the relevance of the reflected solutions to the issue of practical importance. Therefore, I used qualitative interviews (Chapter Five) and a literature review (Chapter Two) in the reconnaissance phase to find the relevance of the social media platforms to the process of improving training courses for student teachers. In the evaluation phase, I used mixed methods research to observe the pre- and post-impact status of the proposed solution for improving the skills of student teachers. Therefore, action research involving the mixed methods approach is referred to as mixed methods action research.

After providing an overview of the action research, it is vital to encapsulate the dynamics of mixed methods. This will enable the comparison between mixed methods and action research and will provide the justification for its integration into the action research approach. The next section discusses mixed methods research with a focus on its utility and components in the context of this study.

### 4.3.3. Mixed methods approach

As suggested previously, there are three research methods espoused most often in educational research: the qualitative approach, quantitative approach, and mixed methods research approach (Harwell, 2011; Creswell, 2003). The quantitative research approach takes its direction from the positivist paradigm, trying to construct knowledge through predetermined theories and testing hypotheses, and the measurement of the cause-effect relationships between the objects of social phenomena. Quantitative researchers employ well-structured data collection instruments such as surveys and experiments in order to collect numerical data, which are subject to vigorous statistical tests to produce the reliable and objective forms of data. Quantitative researchers aim to produce data with the focus on precision, reliability, validity, reproducibility and objectivity through the application of quantitative method (Devetak et al., 2010). Onwuegbuzie and Collins (2007) argue that the quantitative approach is used to increase the generalisability of the findings and promote objective knowledge.

The second important research method is the qualitative research approach, which constructs knowledge in line with the views, perceptions, and experiences of the participants (Hussein, 2009). Qualitative data helps to understand the phenomenon being researched in-depth through the study of a small number of participants. In contrast, quantitative data helps to understand the phenomenon through a large number of participants with a study of only limited elements, and the study in this case was not to be in-depth (Almalki, 2016).

The data, full of verbatim and social pictures, are gathered as part of the data collection exercise using the qualitative research approach, which provides an in-depth and rich account of the social and political changes within society (Klassen et al., 2012). The data collection tools involved in the qualitative research approach are observations, semi-structured interviews and focus group interviews, which include open-ended questions to draw out in-depth knowledge about the research issue under investigation from the participants of the study (Creswell and Clarke, 2017). As the qualitative research approach locates the researcher in the centre of the research process, the potential bias of researchers during data collection, data interpretation and reporting phases of the research might be involved. This drawback of the qualitative research approach is often minimised through the triangulation of data, which is achieved through the use of the mixed methods research approach (Creswell, 2011). The positionality of the researcher in the qualitative studies can also overcome the element of bias while interpreting the qualitative data.

Qualitative research and quantitative research help us to understand the phenomena of research from different perspectives, and each have limitations (Creswell and Garrett, 2008). For example, when studying the phenomenon using qualitative research through a small number of individuals, we lose the possibility of generalising the results. On the other hand, when examining the phenomenon of research according to the quantitative approach through a large number of individuals, it was not be possible to reach an in-depth understanding of each individual (Smith, 2015). According to Maxwell and Loomis:

Designing an appropriate strategy for the study or scientific research is a rather difficult process that can become increasingly difficult if the researcher decides to use mixed methods research because this strategy or method is essentially complex as it contains more than one stage or method of data collection.

(Maxwell and Loomis, 2003, p. 256)

The mixed methods approach, as described by Creswell (2011), is located between the qualitative and quantitative research methods, employing pragmatic assumptions in order to generate the base of knowledge that promotes the thorough understanding of the research issue. Studies show that mixed methods research emerged systematically in the 1980s in sociology, nursing, evaluation, management, and even education studies. This was preceded by many attempts before the emergence of mixed methods research, including the use of multiple sources in qualitative research to achieve validity for research (Campbell & Fisk, 1959). One of the supporters of the diversity of collection quantitative and qualitative sources is Patton (1980), who suggested mixing methods and developed forms to illustrate the link between them.

There are many scientists who have argued for the integration of quantitative and qualitative research in different disciplines such as in sociology (Brewer and Hunter 1989; Fielding and Fielding, 1986), in the evaluation of educational processes in the UK (Greene, Caracelli and Graham, 1989), and in nursing in Canada (Morse, 1991) and in education in the US (Creswell, 1999). Mixed methods research can be defined as the research by which the researcher collects and analyses data, then compiles and integrates the results, deductions and conclusions obtained from the quantitative or qualitative methods or tools in the same study or research. (Creswell and Clarke, 2017, p. 203). Johnson et al. (2007) identified mixed methods research as the type of research in which the researcher can combine the qualitative and quantitative inputs to meet the goal of achieving a deep understanding of the problem studied.

Since this strategy or method of research is relatively new compared to quantitative and qualitative researches, there is still much debate about the importance and value of mixed methods research. Some researchers believe that mixed methods research is more than just a combination of quantitative and qualitative research (Tashakkori and Teddlie, 2010). They see it as a new strategy that opens the way for researchers to study and identify phenomena in a way that was not provided by the other two methods, which is mainly because the quantitative research speaks only in numbers and the researcher does not obtain a deep understanding of the problem acquired through the opinions of the participants in the research (Greene and Caracelli, 1997a; Sandelowski, 2000; Swanson, 1992; Tashakkori and Teddlie, 1998). Therefore, I combined both qualitative and quantitative research approaches to offset the drawbacks mentioned by the scholars above to obtain objective and deep understanding of the potential value of blogs for Saudi teachers’ training systems.

The choice of methods of research and strategies is important while employing the mixed methods approach. The mixed methods may involve a number of tools such as questionnaires or other quantitative data collection tools as part of the quantitative method, and qualitative data collection tools such as personal interviews or observation and other qualitative data collection tools and analysis as part of the qualitative data (Creswell, 2009). The mixed methods approach has flexibility in terms of choice and use of data collection and data analysis tools which allow the researcher to fully understand the phenomenon from more than one perspective and to propose practical solutions (Miller and Salkind, 2002).

In fact, there are several reasons for using mixed methods research. In general, it can be argued that there are research problems of various complexities where mixed methods research is a good choice. One of these situations or research problems is when a single type or source of data is not sufficient to understand a phenomenon (Onwuengbuzie and Collins, 2007). There are some challenges associated with the implementation of the mixed methods research approach. Creswell and Clarke (2011) posited that completion of the research projects might take extra time compared to the single method-based research approach, as it requires the researchers to analyse both quantitative and qualitative datasets. The management of resources and skills are additional requirements for handling projects, along with researcher expertise, to collect quantitative data through surveys and qualitative data through interviews. Another issue is related to the skill of mixing both quantitative and qualitative datasets in order to produce integrated and comprehensive solutions for the issues at hand, and the inability to interpret mixed data can lead to erroneous judgements and conclusions far from the data’s empirical roots. Symond and Gorard (2010, p. 122) posited that, the, “concept of mixed methods has logical underpinnings rooted more in philosophy than in empirical reality”. Some researchers have voiced confusion over the use of terminologies ‘mixed methods’ and ‘multiple methods’. There is no clear distinction between the two terminologies, though both refer to separate research processes. They argue that the multiple methods-based research approach collects data using separate methods and reports them separately, while the mixed method-based research integrates data and produces a coherent picture of reality. This emphasis on the distinction of these terms is not made in books explaining the choices of research methods (Walliman, 2017).

Despite the availability of different research approaches, it is the researcher who ultimately decides the fitness and usefulness of the appropriate methods to address the research questions. The research context and the research questions in my study involved both exploratory and confirmatory questions, which demanded and justified the use of mixed methods research (Almalki, 2016). In addition, I selected the mixed methods research approach based on three important factors including my personal background and experiences, the research audience and the research issues, as mentioned by Creswell (2003). Creswell (2011) posited that it is critical that the researcher should plan the strategy for conducting qualitative and quantitative research as part of the mixed methods approach, decide the sequence of the methods, and understand how to combine the qualitative and quantitative data. It is also important to pinpoint the data collection and data analysis tools, so that comprehensive research design can be constructed.

In my research project, I agreed with Cohen et al. (2011), who argued that application of the mixed methods research approach is, “necessary to uncover information and perspective, increase corroboration of the data, and render less-biased and more-accurate conclusions” (p. 22). I decided to use the mixed methods approach in order to gain an understanding of the behaviours and perceptions of Saudi participants at the evaluation stage of the action research. The choice was made due to the depth and breadth of knowledge required to understand the attitude and perceptions of participants towards the proposed educational interventions. This is in line with arguments put forward by Creswell and Garrett (2008) that the mixed methods research approach enables researchers to make a comprehensive assessment of the research issues under investigation from different perspectives.

Walliman (2017) argued that mixed methods research is useful in overcoming the challenges and drawbacks associated with a single method-based research approach. I agree with Walliman’s (2017) argument that using either a qualitative or quantitative approach alone might produce weak data regarding the effectiveness of planned changes/tool and their implementation in the practical learning environment for student teachers. For instance, Denscombe (2008) and Creswell and Clarke (2017) referred to the utility of the mixed methods approach for increasing reliability and validity of data. A reliable and valid intervention plan is critically important in order to maximise the transferability of the proposed educational intervention beyond the student teachers having training in the studied university in Saudi Arabia.

In summary, I have provided the overview of the mixed methods research approach with a focus on the advantages and challenges associated with its successful implementation in a research design. I found the mixed methods research design an appropriate research strategy based on the research questions raised by my project. I acknowledged the concerns raised by other researchers relating to choosing the research methods carefully that would address the research question.

This study intends to improve the process of training student teachers in the highlighted university in Saudi Arabia, which justifies the use of the action research approach, as was discussed in section 4.3.2. Simultaneously, it is aimed at gaining an understanding of the complexity of behaviours and attitudes towards the proposed educational intervention, which justifies the use of the mixed methods approach, based on arguments given in this section. Hence, the mixed methods action research approach seems the more suitable to address the complexity of research questions in this study. The next section will further highlight the utility and justifications for the integration of the mixed methods action research design for the current research project.

### 4.3.4. Choice of mixed methods action research

Both action and mixed methods research approaches share similarities with respect to their conceptual, philosophical and procedural characteristics, which make the integration of both methods justifiable (Ivanoka and Wingo, 2018). For example, from the philosophical perspective, both action research and mixed methods approach depend on the pragmatism paradigm and favour the mixing of qualitative and quantitative methods to overcome the shortcomings of individual qualitative or quantitative methods to address the research questions comprehensively (Johnson and Onweugbuzie, 2004; Maxcy, 2003). The mixed methods approach is characteristic of the studies that advocate the transformation and improvement of processes through empowerment and provision of tools. Davidson et al. (2009) argued that combining mixed methods with action research not only helped them to develop a health intervention for patients, but it also facilitated the evaluation of feasibility and adoption of the proposed intervention. Therefore, it is expected that mixing both research approaches would help evaluate the value, feasibility and acceptability of the social media intervention for improving the training programme outcomes for student teachers.

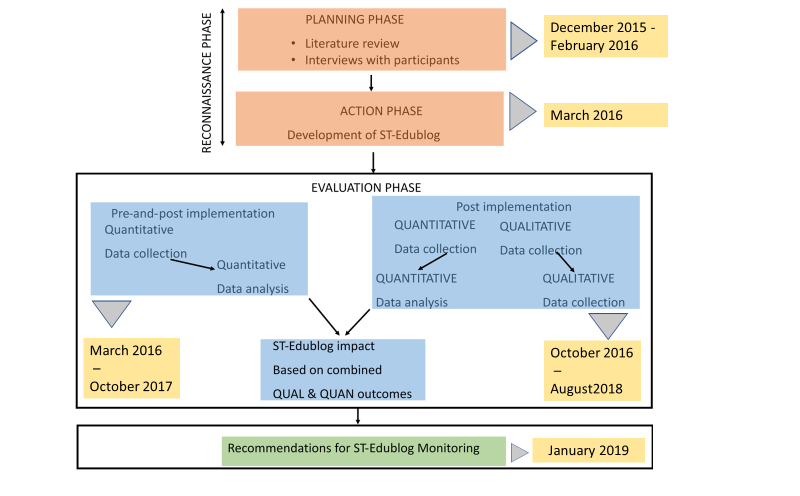
From the procedural perspective, both mixed methods approach and action research allow the sequential application of qualitative and quantitative approaches in a cyclical manner within a single study to answer the exploratory and confirmatory research questions and to find robust solutions to the real-time issues in an organisation or society (Koshy et al., 2011; Teddlie and Tashakkori, 2009).

From the conceptual angle, both action research and mixed methods allow the component of ‘reflection’ to be integrated in the methodological framework, so that next step in the course of action can be decided based on the results from the preceding step (Creswell and Clark, 2011). For example, reflection about the order of the sequence of qualitative or quantitative research specifies the use of data collection instruments and study design in the mixed methods study (Greene, 2007). Similarly, reflection is part of the assessment of the research problem, the development of the intervention and the evaluation of the intervention outcomes for recommending the further steps/actions to sustain the improvement (Mills, 2011).

Based on the discussion in the paragraphs above, it is clear that both action and mixed methods research touch the other’s boundaries at the conceptual, procedural and philosophical frontiers, which allows the integration of both approaches into a single study, which is called mixed methods action research. Ivankova et al. (2014) posited that combining mixed methods with action research carries several advantages for a research project. For example, it can allow the investigation into the impact of the proposed intervention on the satisfaction of training needs of student teachers from different perspectives (Ivankova, 2017). For example, during evaluation of the ST-Edublog/proposed intervention at the evaluation phase of action research, the quantitative data were collected using a questionnaire involving the closed-ended questions about the experiences of Saudi participants with the blogging technology and their skills and knowledge. In the post-implementation scenario, the questionnaire and focus group interviews were used to glean the experiences of participants of the utility of ST-Edublog in the training context of participants. Both datasets enhanced understanding about the potential value of implementation of the proposed educational intervention (ST-Edublog) for developing knowledge and skills.

The MMAR approach also assists me in developing the intervention tool tailored to the diverse training needs of participants, evaluating the intervention/action, and reaching logical and valid conclusions about the outcomes obtained from implementation of the proposed intervention (Herr and Anderson, 2005). Furthermore, in line with arguments extended by Ivankova (2018), the translation of the proposed intervention into practice can be enhanced through its optimisation in the light of research outcomes, which justifies the effectiveness of the change action and increases the implementation potential of the intervention in the training context of the student teachers. Perry (2009) argued that combining the ‘mixed methods’ approach with action research increases the translational efficacy of the educational interventions. In agreeing with Perry (2009), I have chosen mixed methods action research for the current project, which addresses the need for improvement in the student teachers’ training programme at the selected university in Saudi Arabia.

The mixed method action research (MMAR) framework used in this research is shown in Figure 3.1, which included the reconnaissance phase, action phase, evaluation phase and monitoring phase. Several studies have implemented this research design to evaluate the effects of an intervention on users’ outcomes, such as behaviour, and the acceptability of the intervention (Davidson et al., 2009; Ollis and Harrison, 2016). The reconnaissance phase involved the literature survey in Chapter Two, and the action phase is presented in Chapter Five. The evaluation phase was conducted using the mixed methods approach involving qualitative interviews and quantitative surveys. The results are presented in Chapters Six and Seven, respectively. The recommendations for ST-Edublog and link with existing theories as part of the monitoring phase are discussed in Chapter Eight.

Figure 4-1: Mixed method action research (MMAR) framework to examine effectiveness of ST-Edublog

The Action Phase in 4-1 consisted of the development of the Student Teacher Edublog (ST-Edublog. This phase is described in the following section.

### 4.3.5 Building the Student Teacher Edublog (ST-Edublog)

The effective design of ST-Edublog, with the focus on the needs of student teachers, was developed based on a review of the literature, considering the extent to which features of blogs could impact positively on learning, development and self-determination, and by visiting bloggers’ reviews on the development of a useful blog. Many blog writers everywhere feel bewildered by the dozens of blogging platform options, which causes a serious dilemma for new evidence. Mauibob (2009) commented that blog developers had decided which platform is the best to fulfil their needs. Design and features in the blogging platform may vary with the requirements of the users. However, most new bloggers have two options, *Blogger* and *WordPress.com*. The author stated that these two services were the leading blogging websites that made up a massive percentage of the Internet's most popular blogs. He added that they were the best for most new bloggers and those who did not want to pay for their blog.



Figure 4-2: The front page of ST-Edublog

That is why there is a hot debated over which service was better. Furthermore, he found *Blogger.com* to be better than *WordPress.com*. For the purpose of supporting his opinion, he showed seven reasons why *Blogger* was better. *Blogger* was preferred over *WordPress* based on the following reasons. First, *Blogger* was a product of the largest and most powerful internet company in the world, *Google*. This means that new features can be created easily for the blog developed on *Blogger* with the arrival of new features and functions compared to *WordPress*. Second, the ability with *Blogger* to easily connect all *Google* accounts allowed them to use the same login information for all *Google* services, including *Blogger*. Third, *Blogger* had numerous easy options for making changes to the visual appearance of the blog. Fourth, posts were indexed in the search engines much more quickly with *Blogger*, usually within a few hours. This was important as news and posts that did not index for two days may already be too old for people to read. Fifth, setting up a blog on *Blogger* was very easy and took only five minutes or less. Sixth, *Blogger* allowed the bloggers to view all of their blogs. Bloggers can post, edit, or change posts with one-click on the blogs displayed. Seventh, *Blogger* provided massive blogging networks for useful interactions between users. It had the feature of searching the millions of blogs already created in it. Bloggers used the search bar at the top of the page to search blogs. Besides, they could click ’random’ or ’next blog’ to visit a different *Blogger* blog.

Of all the seven reasons mentioned above, the most important one for the study under investigation was ease of use: ”For newcomers to the blogosphere especially, *Blogger* was the best choice when it comes to ease of use … *Blogger* was an ideal solution for anyone who is just starting their first blog” (Mauibob, 2009). Therefore, I was set up an Edublog on *Blogger.com*; and named it Student Teacher Educational Blog (ST-Edublog). ST-Edublog was originally created in the Arabic language using *Blogger.com*.

In the evaluation phase of the project, outlined in Figure 4.1, the participants in the study were engaged in a range of activities in order to evaluate the impact of the project on the learning and development. The next section introduced the characteristics of the participants selected for this study.

The (ST-Edublog) was belong to me and directed, managed and mentored by myself with participation of students teachers, the ST-Edublog aimed and used in dialogue and exchanged of different views related to the training program in schools and issues of common interest among the students teachers during the training period. A plan has been developed for students teachers to include important topics related to the training period in schools, two topics has been determined to be included per week for each student teacher and the student teachers were free to choose as well as they were allowed to discuss each other, ask questions and include multimedia, files and other sources of knowledge when needed. The students teachers were encouraged to publish all problems related to the training period and they were encouraged to give their opinions and to find solutions.

### 4.3.6 Research participants

Creswell and Clarke (2017) define participants as a subset of the population, which shares the desired characteristics with its representative group. The participants represent the group of people belonging to the population of the study, which can provide the necessary information or data to the researcher in order to solve the research issue. There are two basic sampling strategies which are applied to recruit participants from the target population: random sampling and non-random sampling strategies (Taylor et al., 2015). Random sampling is useful when the all the members of the population stand an equal chance to being selected in the study. In contrast, non-random sampling targets the specific group within the population, and members meeting the set criteria of the study are selected as the participants of the study (Neuman, 2007). Non-random sampling is useful in scenarios where the researcher is interested in studying the specific events and processes which are known/experienced by some members of the population more than others (Bickman and Rog, 2008).

For the current study, the purposive sampling strategy, a subtype of the non-random sampling strategy, was used, as it can provide “information-rich cases for study in depth” (Patton, 2002, p. 230). Purposive sampling allows researchers to select the members of the population who can provide in-depth data regarding certain phenomena. This is useful in situations which require researchers to gather data about certain characteristics, behaviours and attitudes of a population towards certain social processes (Creswell, 2009). Bryman (2016) argued that participants are selected based on the researcher’s criteria, and the members of the population meeting the researcher-set criteria are considered the favourites to be included in the study.

The study was conducted in a higher education institution in Saudi Arabia. The student teachers from the Department of Education there were the target population for this study. The following selection criteria were employed to recruit the participants from among the student teachers:

* They are in training stage in the final academic year of their Bachelor degree in Education, so they are classed as ‘student teachers’.
* They have access to the Internet outside the classroom.
* They would have partaken in one of the education blogs during their education.
* They indicate their willingness to share their views and experiences in an online learning environment outside the classroom.

I contacted the head of the Department of Education to recruit participants. After gaining permission and obtaining the list of student teachers studying their Bachelor’s degree in Education, emails were sent to the prospective student teachers. Seventy student teachers replied with their consent to participate. The characteristics of all the student teachers were examined to check whether they meet the aforementioned criteria. After preliminary scrutiny, 34 female student teachers were found to meet the selection criteria. They were contacted via email to participate in this study, but only 20 student teachers responded to the invitation. Therefore, the participants for this study comprised 20 female student teachers. These students were asked to complete two surveys, take part in focus group interviews, and complete refelective diaries. The next section outlines these methods.

**4.3.6.1 Participant Characteristics**

The participants in this study are Saudi female students, 70% of whom are unmarried, 30% are married and have children, which may make a difference in their experience about ST-Edublog in terms of the limited time they spend on discussions in the blog, this was explained through the focus group interviews in chapter six , all of which passed secondary level and   
the participants in this study were categorized into three age groups (Figure 4-3). The 55% of participants (N = 11) belonged to the age group of twenty-one years. The 35% of the participants (N = 7) fell in the age group of twenty years, while the only 10% of participants were of twenty years of age. This suggested that students’ teachers participating in this study were mostly 21 years of age, which was due to the fact the participants in this study had no previous teaching experience.

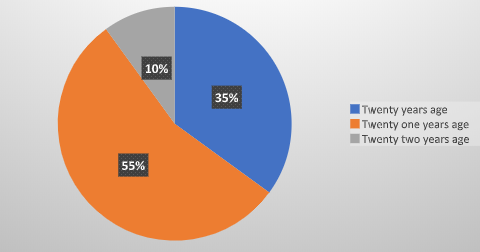


Figure 4-3: The participants age group.

### 4.3.7. Data collection instruments

The data collection instruments used in this study to collect the data are discussed and justified in this section.

#### 4.3.7.1. Survey

Many research projects and dissertations require that primary data be collected from individuals. Questionnaires are often the best way of gathering such information and views. Questionnaires offer an objective means of collecting information about people's knowledge, beliefs, attitudes, and behaviour (Oppenheim. 1999). The principal requirement of the questionnaire format is that questions are sequenced in a logical order, allowing a smooth transition from one topic to the next (Sarantakos, 2005). According to Gillham (2000), questionnaires that have been developed and sequenced with careful consideration have many advantages, including efficiency, anonymity and cost-effectiveness. Questionnaires are an efficient way of collecting data on a large-scale basis because they can be sent simultaneously to a large number of people. Simultaneous distribution of identical questions to a large number of people allows for replicable and standardised results. Questionnaires also allow the inquirer to gather data in field sites easily. Anonymity is another benefit of questionnaires, and enables respondents to share information more easily. In addition, questionnaires are cost-effective. For example, they are a time-efficient way of collecting data from many people. Closed-ended questionnaires in particular can be easily analysed in a straightforward way (Gillham, 2000).

On the other hand, questionnaires have some disadvantages, which should be kept in mind whenever and wherever they are used, including inaccurate or ambiguous responses and low return rates. Sometimes too, the answers are inaccurate and questionable. Ambiguity in some questions might lead to inaccurate or unrelated responses. Some questions may cause misunderstanding, particularly if attention is not paid to the wording, and this misunderstanding could affect the responses. In addition, there is usually a low return rate when sent by post or email (Gillham, 2000; Brown, 2001).

Despite some disadvantages associated with questionnaires, it was deemed to be useful in addressing the research questions in this study. The 20 female students participating in the study were asked to complete the surveys twice in order to understand their views and experiences before and after the use of the ST-Edublog. There is a controversy over the sample size for quantitative research in the mixed methods approach (Onwuegbuzie and Collins, 2007). Some scholars recommend the use of a sample size between 30 and 50 for surveys (Creswell, 2002; Charles and Mertler, 2002); some researchers are of the view that if the qualitative component is larger than quantitative component in the mixed methods, the group size can be small and should not necessarily be large (Creswell, 2012; Onwuegbuzie et al., 2004). Furthermore, there is a predominant view that when a mixed methods approach is combined with action research, the number of participants in the action research can be used to quantify the perceptions in the evaluation phase (Ivankova and Wingo, 2018). There is no consensus on what constitutes an adequate sample for action research, but most studies using the mixed methods action research used a sample size of between 15 and 30 participants per group (Ollis and Anderson, 2008; Heslop et al., 2017). Ivankova and Wingo (2018) argue that a small sample size in mixed methods action research-based studies is due to the very nature of such studies, which intend to address only issues related to a single group with defined characteristics. This argument is applicable to this study, which focusses on the introduction and evaluation of educational intervention for a group of student teachers to improve their training experiences. Out of 34 students who met the selection criteria, only 20 were available to participate. This reduced my ability to recruit the larger sample size. Moreover, the small sample size in a survey can be used if the study does not intend to generalise the outcomes of the study to the larger population in the same or similar contexts (Heslop et al., 2017).

In line with the argument above, this study does not intend to generalise the results of interventions on student teachers receiving training at Saudi universities. This warrants the use of a small sample size for the survey part in the evaluation phase of this study. It is worth mentioning that the sample size in this research work depends more on the dynamics of the groups in terms of arriving at agreement with the existing literature than the statistical power of the sample size. For such studies, the number of participants between 10 and 20 is considered adequate for drawing conclusions representing a population with nearly homogeneous characteristics (Heslop et al., 2017; Ollis and Anderson, 2008).

Two data collection questionnaires were used to collect data from participants in this research work. The first questionnaire was used to determine the participants' levels of confidence, competence and interactive environment before the implementation of ST-Edublog (see Appendix C). The second questionnaire was developed after the implementation of ST-Edublog (see Appendix D). The aim of the questionnaire was to explore participants’ feedback on being engaged in ST-Edublog. Its specific objective was to investigate participants’ reactions towards online interaction using ST-Edublogs. The second survey was developed to explore the participants’ perceptions of the factors associated with ST-Edublog contributing to knowledge and skills development. The questionnaire contained five constructs: sense of community with one item, perceived enjoyment with three items, perceived usefulness with two items, perceived ease of use with two items, compatibility with three items, and perceived impact on learning with three items (see Appendix E).

#### 4.3.7.2. Focus group interviews

In order to explore participants’ responses to the ST-Educblog in greater depth, focus group interviews were used. According to Alebaikan (2010), a focus group interview is considered to be a useful data collection method when the topic under investigation is of common interests for the researcher and the participants. This study deals with the training of student teachers; I, as a tainer of student teachers, and student teachers (participants) hold the similar interest of improving the training experience of teachers, therefore, the informal conversation between me and the student teachers is more likely to yield the useful and in-depth data for addressing the research questions in this study (Alebaikan, 2010). Krueger and Casey (2014) described focus group interviews as, “a carefully planned series of discussions designed to obtain perceptions on a defined area of interest in a permissive, non-threatening environment” (p. 2).

While focus groups are essentially group interviews, they exhibit significant differences that must be kept in mind. While traditional group interviews focus on the interaction between researcher and participants, specifically the participants’ answers to interview questions, focus groups are primarily based on conversations between participants regarding predetermined subjects (Morgan, 2002). In developing nations, focus group discussions (FGDs) are a popular means of gathering information. In English-speaking nations, after an initial burst of excitement about focus groups, a new philosophy of ‘sceptical enthusiasm’ developed, demonstrating a more balanced view of focus groups and their particular advantages (Jakobsen, 2012).

As with any technique for gathering data, FGDs have specific advantages and disadvantages. Hardon, Hodgkin and Fresle (2015) mention that, on the plus side, FGDs are inexpensive and can be conducted quickly. Group discussions would also enable access to a wide range of knowledge and diversity of experiences around Edublogs. The group setting often encourages participants to describe their own opinions and experiences in response to those of others. On the other hand, the success of FGDs is heavily reliant on the abilities of the moderator. Discussions may proceed in unexpected directions; it is also possible for one or several more assertive participants to overshadow the rest of the individuals in the group, whose views may not be heard. Due to the nature of group discussions, opinions may not be expressed in great detail. It may also prove challenging to analyse the collected data (Hardon, Hodgkin and Fresle, 2015).

This study used the focus group interview due to the benefits above. The first set of focus group interviews was held at the pre- implementation stage of ST-Edublog project, and the second set of focus group interviews were conducted at the post- implementation stage of the ST-Edublog. Carlsen and Glenton (2011) claimed that focus group interviews should involve a minimum of five participants in the focus group, which suggests that the number of participants selected for focus group interviews was in accordance with recommendations from previous researchers.

The focus group interviews were conducted using two online channels: Skype, and WhatsApp. Conversations were held using Skype; however, participants who faced some issues with listening or responding to the questions employed WhatsApp to answer them. Each focus group interview lasted for 45 minutes. I led the discussion on the questions and topics of interest. The interviews were recorded via the recorder.

#### 4.3.7.3. Reflective diaries

Wellington (2000) asserted that diaries can be a better resource than other methods and, “are especially suited to those who prefer to write their thoughts and perceptions as opposed to being questioned orally or observed *in* *situ*” (Wellington, 2000, p. 120). According to Jill et al. (2009), reflective writing is a versatile resource. In addition to being a sociable and pleasurable activity, writing is a tool for reflection and personal learning in many settings, including teaching. Many teachers can find their personal diaries useful in reminding them of the activities they have performed in the past, which further allow them to reflect deeply in order to draw the meaningful conclusions for improving their activities. Hence the personal diaries can be turned into the resourceful reflective diaries which are accepted as useful data sources in all subjects of social sciences (George, 2002).

This is particularly true in the case of professions that require some practical experience such as education, nursing, social work and pastoral care in religious ministries. George (2002) states that reflection provides an opportunity to learn from previous cases and to maximise the benefits of experience. Journaling and written reflection is less well utilised in scientific disciplines, but there are many advantages to using reflective journals. According to Moon (1999), reflective writing through diaries has the following benefits: it deepens the quality of learning by encouraging critical thinking or developing questioning attitudes; and it also enables learners to understand their own learning process as well as increase their active involvement in their own learning and personal ownership of their learning. Reflective journals enhance creativity by making better use of intuitive understanding and by fostering reflective and creative interactions in a group.

The student teachers taking part in this study were asked to keep a record of their experiences and interactions while engaging with the ST-Edublog. Hence, the reflective diaries constituted the first-hand experiences, reactions and responses to the use and utility of ST-Edublog in affecting the learning and skills development during the training programme.

## 4.4. Reliability, validity and trustworthiness

Reliability is usually measured through internal consistency, which refers to the ability of the questions to measure the same characteristics if they are asked again. Hence, the internal consistency assures the reproducibility of the survey’s data if it is repeated in a similar or the same context. The internal consistency can only be measured if the number of participants is equal to or greater than 50. The number of participants in the survey with less than 50 yield a value lesser than 0.70, which is the required threshold for considering the reliability of the scale of questionnaires. However, if the researcher is forced to survey fewer than 50 participants, then there is no need to calculate the reliability using the Cronbach Alpha (Javali et al., 2011). Based on this, the internal constancy was not calculated using the Cronbach Alpha.

Validity is the measure of the degree to which research instruments measure what they are intended to measure. Validity may assume different forms depending on the research context and research questions including face validation, content validation, criterion validation and construct validation (Radhakrishna, 2007). Wiersma (2013) described the two other forms of validity: internal validity, which aims to measure the scale of measurements against which concepts are being evaluated; and external validity, which is concerned with measuring the generalisability of the findings against the settings and population. According to Mora (2011), most surveys are face validated, which requires the reviewing of survey questions by experts to check whether the researcher can collect the right answers as expected. If the experts agree on the quality of questions in terms of their abilities to measure the expected concepts, the measurements made by questions are valid. If they suggest any changes, then the researcher needs to incorporate the suggested changes in order to improve the validity of the questions. I have submitted the surveys to the experts for feedback on the language, arrangments and suitability to collect the desired information. The changes suggested by experts in the field were incorporated into the survey questions, which improved the validity of data.

Reliability and validity are more appropriate for checking the quality of the scale of the survey; however, for qualitative data, researchers have suggested the use of term ‘trustworthiness’ for judging the quality of the qualitative data gathered through interviews (Lincoln and Guba, 1985). The authors have argued that trustworthiness can be evaluated using two parameters: dependability and confirmatory. Golafshani (2003) added two more parameters for the evaluation of trustworthiness: credibility and transferability. I have discussed the trustworthiness of the qualitative data using three parameters: credibility, transferability and dependability. Credibility is refers to the “confidence that can be placed in the truth of the research findings” (Korstjens and Moser, 2018, p. 121). Korstjens and Moser (2018) further posited that credibility evaluates the degree to which the interpretations of the data matches with the original data collected from the participants. Many researchers have espoused the use of triangulation to increase the credibility of qualitative data (Creswell and Tashakkori, 2007), which involves the use of different data collection tools to compare and contrast in order to mitigate the inherent bias associated with a single method-based research approach (Noble and Smith, 2015). I employed different research methods to increase credibility of the interview data. For example, the focus group interview data were collected to increase the depth and breadth of the knowledge gained from the quantitative data obtained through the surveys.

Transferability is the parameter that evaluates the degree to which the outcomes from qualitative data can be transferred to similar settings (Korstjens and Moser, 2018) or to other participants within the same context, simultaneously (Lincoln and Guba, 1985). Creswell and Clarke (2011) argued that transferability is a useful aspect of data trustworthiness, as qualitative data are often applicable to a specific site at a particular time. Transferability can be increased by offering all the necessary protocols and details of the research methods and framework used to reach conclusions. This can facilitate the transferability of conclusions drawn from qualitative data. My research project has unfolded sufficient details of the research methods, ST-Edublog environment, and ways of interpreting data, which can facilitate the transfer of findings to the similar or same contexts in other training institutions in Saudi Arabia.

Dependability and confirmatory are two additional parameters which makes the data collection and data reporting procedures as transparent and ethical as possible by adhering to research ethics (Korstjens and Moser, 2018). Neuman (2007) argued that dependability refers to the recording of all research steps from development to the finishing stage of the research project and should follow the established guidelines of the research design. The confirmatory aspect of judging the quality of data refers to the interpretations of data based on participants’ accounts without mingling in the preferences of the researcher (Williams, 2007).

## 4.5. Data Analysis Tools

### 4.5.1. Thematic analysis for qualitative data

This is a mixed methods study that employs qualitative and quantitative research approaches. Qualitative data collected from focus group interviews and reflective diaries were analysed manually by thematic analysis involving coding and organising codes into emergent themes.

The thematic approach was used to analyse the focus group interviews and reflection diaries. The following steps were followed to create themes from the qualitative data:

1. The data transcripts were translated from Arabic to English by a professional translator. The translated material was compared with the original Arabic version to find any anomalies in the translation.
2. The translated transcripts of qualitative data from the focus group interviews and reflective diaries were read several times to grasp the key phrases or recurrent words relating to the research questions. These phrases/words were called codes, and were written in the coding book.
3. The codes were compared and contrasted to identify the codes with the same or similar meanings, and based on this comparison, themes were generated from the list of codes.
4. The themes were further compared and contrasted with each other to detect the patterns of similarities and differences. This exhaustive comparison led me to develop the broader themes, which were used to report the findings in the results section of this report.

The themes and codes generated from qualitative data by following the above steps can be seen in Appdedix H.

### Statistical analysis for quantitative data

In order to analyse the data from the questionnaire, descriptive statistics were used in this study. The benefit of this approach includes its flexibility and ability to find answers to questions through the relationship of the analysis of variables and its strength in summarising and describing numerical data. Tables and graphs were used to illustrate the statistical data. The mean and standard deviation values of student teachers’ perceptions regarding the technology were determined using the Wilcoxon Signed Rank test for non-parametric paired participants. The non-parametric Wilcoxon Signed Rank test is a useful statistical instrument that assesses whether the difference between the measured concepts is significant. This allowed me to compare values both before and after the implementation of the Edublogs project.

## Ethical considerations

In light of the discourse above and taking into account the University of Sheffield Code of Practice for research ethics, significant ethical considerations were integrated whilst directing the study. These practices included seeking authorisation and informed consent as well as guaranteeing the confidentiality of participants. I submitted the research ethics application to the University of Sheffield’s Ethics Committee for approval prior to the data collection. I also submitted the research plan including the research design to the faculty remembers of the School of Education to guarantee that all procedures and steps being followed were in line with the accepted protocols. I have retained records of all steps and procedures during data collection and data analysis, and received feedback on the final report to remove any potential errors creeping into the structure of the report.

The questionnaire provided to the respondents also highlighted all the ethical conditions under which the intended study would be conducted, with emphasis on the understanding of safety and protection of human rights. Therefore, it was not a requirement for respondents to put their names or private information on the completed questionnaires. The level of confidentiality was also extended to any qualitative approach medium applied to the study.

Overall, all information acquired from participants were anonymised to keep the members' identities confidential. Furthermore, for all respondents, it was thought that any sensitive inquiries that might discomfort respondents were avoided. In addition, meetings were organised only in a private space preferred by the researcher. The ethical review was carried out to the highest ethical standards in both Sheffield University and in the Ministry of Higher Education in Saudi Arabia. Following that, I obtained official permission to implement my research from the Ministry of Higher Education.

Corrigan (2009) stated that informed consent should be sought from the participants prior to data collection and must be optional. Informed consent is treated as a process leading to the provision of all necessary information regarding the nature of the project, and the risks and benefits associated with participation in the research activity. Informed consent is mandatory for all studies involving human participants regardless of the nature or purpose of the research. Gall, Borg and Gall (2007, p. 69) emphasised that “researchers must inform each individual about what will occur during the research study. If adults are the participants, they must give their consent”. Accordingly, each participant was given the information sheet and asked to choose to engage and sign the consent form after getting an overview of the project proposal. I contacted the potential participants in person to explain the study and give them full details about it. At that stage, I asked them to sign the consent form.

Gall et al. (2007, p. 72) points out that, “research participants should be told at the outset of the study who will have access to data”. The names of the participants were not published. All survey data were confidential as the students were anonymised. Qualitative data was also be anonymised. As mentioned earlier, a recorder was be used to record the interviews; the recordings were made with regard to the sensitivities of the student teachers. The recordings and data will be destroyed after two years. As mentioned earlier, I work as a supervisor of student teachers. When I visited the university, I introduced myself as a PhD student, not as someone undertaking supervision. My previous students were not engaged in the research in order to minimise any effects that might have on the research findings. My main roles and responsibilities in this research include mentoring student teachers, clarifications their questions and quries, facilitating their response and encouragement and follow up their comments, in addition to analysis all collected data using different data collection tools.

Also during the blog, I supervised their discussions about their teaching methods, and I was noticing their posts and suggesting other topics related to the teaching methods of discussion as I granted them freedom of expression without external pressure, where I told them that whoever wants to withdraw from the research has all the power to do so.

Moreover, this research used a private blog managed by me, which meant that nobody apart from the selected participants could create an account on the ST-Edublog.

## Summary

This study employed the mixed methods research approach including qualitative and quantitative research methods. The purposive sampling strategy was employed to recruit the participants from the target population of student teachers studying at the Department of Education in Saudi Arabia. Twenty female teachers made up the group of participants for both the qualitative and quantitative phases of this study. The data collection tools involved two surveys, participants’ reflective diaries, and focus group interviews. The qualitative data were analysed using thematic analysis, with various steps of coding and development of themes. The quantitative data were analysed using state-of-the-art statistical procedures. During the collection of data from participants, ethical considerations were observed including the respect to privacy, confidentiality of data and informed consent of participants, which was sought prior to data collection.

In the next three chapters, the findings are outlined in relation to the research questions.

# CHAPTER FIVE

# PERCEPTIONS OF STUDENT TEACHERS ABOUT THE EFFECTIVENESS OF

# E-LEARNING TOOLS

## 5.1. Introduction

The overall aim of this study was to find the appropriate e-learning tool to be developed and implemented in Saudi Arabia to improve the learning experiences of student teachers as part of, or outside, the classroom activities. The specific aims were, therefore, to examine how student teachers responded to a project that involved the use of an educational blog to support their learning. It was felt important, however, to identify at the beginning of the project what the students felt about the use of blogs compared to other social computing applications. This chapter presents findings in relation to the following research question:

*What perceptions do a group of Saudi student teachers have of blogging technology in comparison to other social computing applications (e.g. Facebook, Twitter, Snapchat)?*

As this study pursued the mixed methods action research (MMAR) design, as explained in Chapter Four section 4.3.4, the first phase of the MMAR framework used for this study was to implement the reconnaissance phase and involved the planning stage as its first components. The planning was executed using the literature review (see in Chapter Two) and the first set of focus group interviews with participants in order to assess their attitudes towards different social media prior the use of the developed educational intervention.

## 5.2. Findings from the first focus group interviews

In this section, the findings derived from first set of focus group interviews are presented. The information and detailed process of applying the thematic analysis for the qualitative data can be viewed in Chapter Four, section 4.5.1. The themes and codes table can be seen in Appendix F attached at the end of research.

### 5.2.1. Usage of social media for student teachers’ learning

The student teachers were asked about their daily usage of social media to ascertain their familiarity with such applications and to gain some information about their competence in using various online apps. The results showed that the student teachers had used many social media applications before and after enrolling on the Edublog project such as blogs, Twitter, Facebook, Instagram, and email. For example, one of the participants mentioned that she used WhatsApp before the enrolment on the study programme, while most of them reported the use of blogs to collect information about their courses, class management, and teaching skills. For example, as a result of focus group discussions Amjad said:

*When I could not find the right information about class management, I tried to look for comments posted on blogs by other experienced .* [Amjad]

As a result of focus group discussions, another student supported the comment of Amjad, by saying:

*The emails and Snapchat are not good ways to find the right answer to problems in learning, as you cannot post long text. However, blogs provided me with a good source of information about my problems.* [Wafa]

From the above comments, it is clear that some social media platforms put restrictions on the length of written communications, which make their use limited for students. For example, Twitter does not allow comments any longer than 140 characters (Sikdar et al., 2013). Similarly, Snapchat is built for posting pictures rather than writing textual material (Verstraete, 2016). The participants were satisfied by the communications held on blogs, as they can post or read the articles providing in-depth information to help solve their teaching issues.

### 5.2.2. Student teachers’ perceptions of Snapchat

The data gathered from respondents showed some interesting themes to highlight the role and importance of Snapchat in learning activities. Most of the respondents said that they had downloaded Snapchat; however, the purpose of the download was to communicate with friends and relatives. For instance, one of the respondents mentioned during the focus group interview:

*I downloaded Snapchat, but my sister asked me to download the Snapchat to share family pictures and other related information about daily activities. [Hind]*

Another respondent expressed a similar view:

*My mum and dad had Snapchat, so I downloaded to keep in touch through snapchat, as it is the one of the best platforms to share family moments.* [Amany] [focus group interview]

A further respondent supported the comments of Hind and Amany and described their use of Snapchat for sharing videos of events and functions with friends. These data suggest that student teachers participating in this study used Snapchat for sharing videos and pictures.

The respondents were asked about information sharing relating to courses, assignments and lectures. Most of the respondents were of the view that they rarely used this platform to share information about the classroom activities. Amany expressed her thoughts:

*I seldomly use the Snapchat to discuss with my friends about the classroom activities such as assignment, information about lectures, and academic stuff.* [Amany] [focus group interview]

Another respondent added:

*…the academic stuff is too serious a subject for this kind of application. If I am confused about exam dates, and see my classmate online on Snapchat, I do not mind confirming timing and dates of training sessions.* [Wafa] [focus group interview]

Taken together, these data indicate that respondents use Snapchat only to share information about family events, social functions and other daily activities. Studies have revealed the popularity of Snapchat among university students for sharing pictures rather than holding serious discussions about their subjects (Muscanell and Khalid, 2015; Dobies and Nelson, 2016), which supports the findings of this study. However, some studies reported the opposite. For example, Freyn (2017) reported the use of Snapchat in classrooms by students to encourage other students to participate, practise their language outside the classroom, and communicate with each other. Dreid (2016) revealed similar outcomes, showing that university students use Snapchat as an attractive platform to connect with other students and share the information relating to their courses, pictures of lecture slides and messages about assignment deadlines.

The difference in the outcomes of previous studies with ones reported in this study might be explained by the socio-cultural context. Academic institutions in the developed countries are able to spread awareness of the usage of social media as a tool of learning; therefore, students might be aware of the use of social media to share information about the classroom-based activities with each other. However, this is not the case with the teaching institution in Saudi Arabia that was the site for this study, which is more inclined to use the traditional classroom-based methods for communication.

### 5.2.3. Student teachers’ perceptions of YouTube

YouTube had more favourable comments from participants, who admitted they found it very useful and they associated it with professionalism. Reem explained how the videos on educational, cultural and medical channels helped her to understand some of the complicated concepts discussed by the trainers in the classroom:

*If I have confusion about some pedagogical practice, I search for the concepts on YouTube. Sometimes I find good explanations, but sometimes, I cannot find interesting clips to increase my understanding.* [Reem] [focus group interview]

Another respondent supported the views of Reem and expressed that:

*YouTube is an interesting platform to learn about the pedagogical methods from some academics who upload videos on YouTube. I find it difficult to find the animated clips for the pedagogical practices. Sometimes it does not meet my learning needs.* [Ahlam] [focus group interview]

Interestingly, both respondents supported the utility of YouTube for their learning; however, they were not fully satisfied with the practical and functional applications of this platform for knowledge and skills development. Balakrishnan and Gan (2016) argued that YouTube can be helpful for students if the learning needs are fully integrated into the functionalities of YouTube. Without proper expertise in using the YouTube contents, the users are unable to find the right tools and videos to increase the learning experience (Brook, 2011); however, skilled users cannot find the information if it is not available on YouTube.

Some of the respondents also mentioned the presence of advertisements on their favourite video clips, which drove them away from having the true learning experience while watching their favourite content:

*There are too many ads in videos, which distracts me from getting a good understanding of the topic of my interest. I often leave the videos half way, due to pressure from my household chores. [Rana]* *[focus group interview]*

This showed that the use of YouTube as a learning platform is limited by advertisements appearing while watching video clips about pedagogical processes. The advertisements cause a pause in the learning, and distract the users from the actual messages conveyed by the videos to the viewer. This is supported by Mao (2014) and Fleck et al. (2014) who showed that video clips paused by advertisements are detrimental to the recall abilities of the students. Therefore, effective learning and skills development by using YouTube has limitations as a learning tool for the participants in this study. Several studies have shown evidence regarding the positive impact of YouTube on the learning of students (Sherer and Shea, 2011; Liu, 2010; Rapp et al., 2016).

Nonetheless, most studies reported the efficacy and efficiency of YouTube in the classroom-based learning system, which was mainly due to the customised YouTube content meeting students’ learning needs (Clifton and Mann, 2011). It can be argued that despite the value of YouTube as an emerging educational resource for many disciplines in different countries, it does not offer substantial utility for student teachers in Saudi Arabia due to the limitations of YouTube as a learning source discussed above.

### 5.2.4. Student teachers’ perceptions of WhatsApp

Most respondents reported that they use WhatsApp for communication purposes:

*I have downloaded WhatsApp on my mobile to communicate with my family members, and friends”. [Sarah]* *[focus group interview]*

However, all of the respondents expressed their opinion that the information sharing on WhatsApp was not for typically academic or educational activities in their teaching disciplines. The information shared by users on WhatsApp was restricted to socio-cultural activities, politics and beliefs rather than building the knowledge and skills of users in a specific discipline. This was evident from the opinions expressed by Wafa:

*I always share information about politics, which is the hottest topic with my friends.* [Wafa] [focus group interview]

Another respondent talked about sharing religious beliefs on WhatsApp:

*I share the messages about religious beliefs, activities and events.* [Reem]

None of the respondents reported the use of WhatsApp as a learning tool to discuss the contents of the training, difficulties in training, or development of pedagogical skills, which indicates that the popularity of WhatsApp among the student teachers was due to its increasing role in communicating social, political and religious information rather than promoting the debates on pedagogical issues, sharing information about the management of students or classroom-based activities.

Several other studies have pointed to the application of WhatsApp in sharing knowledge in the areas of religious, political and social issues of common interest, thereby corroborating the findings of this study (Gon and Rawekar, 2017). Anderson (2016) argued that WhatsApp and other social media channels such as Twitter and Facebook are not viewed as platforms for sharing big chunks of data, which are usually required when trying to explain experiences of users about certain phenomena. This supports the views expressed by respondents in this study.

There are many studies which reported the use of WhatsApp as a learning platform for students (Bouhnik et al., 2014; Robinson et al., 2015); however, these studies found that some institutions were involved in customising the use of WhatsApp in order to increase the learning experiences. For example, Robinson et al. (2015) reported the utility of WhatsApp in solving the radiographers’ problems through problem-based learning groups. Hence, WhatsApp’s beneficial effect on the learning can only be improved if it is properly managed by the academic and training institutions for the sake of improving the learning experiences of students.

### 5.2.5 Student teachers’ perceptions of Twitter

All of the respondents taking part in this study described that they used Twitter as a channel for contacting others quickly and easily and exchanging views and opinions about products, social events and political matters. For instance, Wafa liked the fact that only short messages can be sent:

*Twitter has taught me that 144 letters is as good as a newspaper of 48 pages published daily; the news arrives to you faster, fresher and maybe immediately.* [Wafa] [focus group interview]

Another respondent reported using Twitter for seeking academic advice, and sharing experiences in short messages rather than long messages:

*Also, you can benefit from experiences and advice from experts and academics in the list of friends on Twitter.* [Sara] [focus group interview]

Most of the respondents used Twitter for exchanging general information about social and cultural values, as Wafa expressed:

*I get the benefits from Twitter by sharing, famous quotes, important links of subjects which are of common interest between me and my followers.* [Wafa] [focus group interview]

These data indicate that usage of Twitter for dissemination of knowledge and experiences about a particular subject was limited, and that the vast majority of respondents believed in using Twitter for sharing non-academic information among followers. This provides evidence of the limited role of Twitter among these student teachers in Saudi Arabia in the context of knowledge and skills development while they are in the training phase. Many other studies have confirmed the low level of Twitter usage among students in order to enhance knowledge and develop skills (Lin et al., 2013; Schuck et al., 2017; Knight and Kaye, 2016). Lin et al. (2013) showed that students are mostly found using Twitter to share information about jobs and admission criteria of UK universities.

Carpenter and Krutka (2014) showed that students find it inconvenient to seek out reliable sources of information, which might be the reason behind the low level of Twitter usage for building knowledge. Nevertheless, some studies highlighted the significance of Twitter in improving the teaching and learning among different faculty members and students (Bexheti et al., 2014; Kassens-Noor, 2012; Blair, 2013; Evans, 2014), which differs from the findings in this study. This difference is due to the institution supporting a campaign among faculty members to use Twitter for knowledge and experience sharing.

It is clear from this study that many student teachers used the Twitter application because of its benefits, such as the ease of adding a friend via one click. There is also no limitation to the number of friends each person can have. However, the use of Twitter for learning and skills development was found to be limited among the participants in this study. However, one should be careful to extend these findings to other universities in Saudi Arabia due to potential changes in usage patterns of students in different regions of Saudi Arabia. Binsahl et al (2015) reported regional variations in the usage and purpose of social networks in different parts of Saudi Arabia.

### 5.2.6. Student teachers’ perceptions of Instagram

Most of the participants used Instagram and this proved to be the most popular application overall in this study. The value of the app was in its versatility; the student teachers liked the variety of information provided and the fact that it was easy to keep content private. One of the respondents mentioned about the networking and communication link through Instagram:

*Instagram is a social media site, and it helps me to create networks with friends, make new friends and share important information.* [Hind] [focus group interview]

A respondent was asked about the type of communication and content shared by her with her friends:

*I share pictures, some news about the friends, and chat about the any important situation in the count*ry. [Sara] [focus group interview]

Many other respondents echoed similar views on the use of Instagram, which indicated that Instagram was being used for social chatting rather than any academic function by these student teachers in Saudi Arabia.

When the respondents were asked the prompt question about the use of Instagram and the learning and skills development during their trainings, most commented on the utility of Instagram for sharing general information about the training and experiences rather than particular data which could assist them in sharing knowledge, improving their skills or contributing towards the overall learning experience. One of the respondents was of the view that:

*Instagram is a suitable option for quick communication of removing confusion about training dates, teachers and training venue.* [Amany] [focus group interview].

Another student teacher described her experience like this:

*Once I did not know which class I was going to teach. I texted my friend through Instagram to ask her about the class schedule, so that I can prepare myself to the lessons I was giving to deliver.* [Hada] [focus group interview].

Wafa used Instagram to check with her friends about the location of schools:

*I received the schedule of events in the beginning of training programmes. However, the authorities have the habit of changing venue, which often causes great confusion among my fellows. I find Instagram is a quick way of getting information about any changes.* [Wafa] [focus group interview].

The aforementioned comments from different respondents clearly show the nature and purpose of the use of Instagram by the student teachers during their training and learning. This study could not find any convincing evidence of Instagram being used as an e-learning tool for increasing their knowledge, or sharing experiences leading to an improvement of skills among them. It also corroborates with the fact that Instagram has little popularity among student teachers as a skill development tool. This might result from the commonly- held notion that social media platforms are only used for communication with friends and relatives, and also for making new friends (Kutbi, 2015; Al-Ali, 2014).

Another study showed the use of social media platforms such as Instagram for sharing social experiences, rather than posting the long conversations and documents, which are essential to communicate experiences with the purpose of gaining knowledge (Alnujadi et al., 2017).. The restriction lies with Instagram in its very nature and function. It does not allow the attachment of long documents such as journal articles or lengthy posts about someone’s experiences of class-based study and training events. Due to these limitations, Instagram could not attract the interest of students to use it to interact with their peers in a self-motivated manner.

However, some studies in the literature have illustrated the controlled application of Instagram increasing the level of communication between students and their peers in terms sharing their experiences, taking part in online discussions, and motivating feedback on language-learning activities (Akhier et al., 2017; Masnor and Rahim, 2017). The authors showed that Instagram was a useful social media tool for fuelling the interest of learners to share their experiences, which greatly enhances their motivation to develop functional skills. Many other studies reported the same outcomes, but the motivations for students to apply Instagram to share videos of lectures and other learning activities were institutionally controlled (Goodwin-Jones, 2011; Mansor and Rahim, 2017; Alnujaidi, 2017). However, this might not the case with the Saudi training institutions which are tailored to provide education and training to student teachers based on traditional teacher-centred concepts (Al-Kabba et al., 2012; Telmesani et al., 2011).

### 5.2.7. Student teachers’ perceptions of Facebook

Although Facebook may be the most popular social media platform in the world, it was not seen as useful by the majority of the student teachers. On the whole, they preferred other applications, which they believed had more helpful features. There were some student teachers who found certain aspects of Facebook practical and of some benefit to them. Sara was an advocate of using Facebook, explaining why she liked it as follows:

*I found that by Facebook I can easily share any type of content: videos, images, blogs, and scripts only with one click, any content may go viral and my idea will go to everyone.* [Sara] [focus group interview].

Another respondent mentioned the use of Facebook for obtaining help to solve problems:

*Once I have a problem, I only need to write about it on any Facebook group and tens of people will help me.* [Hada] [focus group interview].

Wafa supported Hada’s view, suggested she would use Facebook to get help from people and professionals if she had a problem in a specific area. The data could not provide any evidence regarding the use of Facebook in obtaining help in education, subject-specific help or advice for improvement of teaching skills; nevertheless, it does not preclude the use of Facebook by the entire population of student teachers in this study. Due to the small sample size, these results cannot be generalised to include student teachers studying in other universities in Saudi Arabia.

Most of the respondents viewed it as a social chatting site rather than having discussions on serious issues like academic problems. This again shows that participants have the skills to enhance their social media experience by understanding how to utilise the functions that are useful to them on such applications. They showed that they had skills in accessing support through Facebook, as there are many diverse people sharing posts and willing to provide their views and opinions. There may be a problem, however, in that many users are unaware of the features available and consequently student teachers participating in this study might be missing out on gaining advice from other, more experienced Facebook users in the subjects of interest, or even from other student teachers. In addition, Facebook does not save the information in a structured way so that any advice given will become yesterday’s news very quickly.

Some respondents also reported less inclination to use Facebook to share experiences and other academic content for learning purposes, as it requires confidential and private information from users before registration. For example, Amgad expressed her views:

*Facebook tries to use your personal data for advertising and gains a huge amount of money through it. So I prefer not to use Facebook .* [Amgad] [focus group interview].

Amgad’s comments indicated that she had been influenced by aspects of Facebook that are not directly connected to how useful the content is to her. She has strong ethical principles about the use of her data. This will always be a concern when using such social media apps as they are set up to be commercial ventures and to market products and services to Facebook users. Other student teachers commented on the advertising that they found to be intrusive and also the number of notifications that came through to them whenever someone posted comments.

Along with the other applications, Facebook provides a platform for exchanging content with others, whether photos or information; however, such content is presented in a haphazard way and there is no structure involved in the way the content is disseminated. Throughout these social media interactions with which most student teachers are familiar, there is no structured learning taking place. For effective interactions of student teachers with Facebook, the integration of Facebook into the training of student teachers is necessary in Saudi teachers training institutes, as is evident from outcomes reported by many other studies (Irwin et al., 2012; Pimmer et al., 2012; Prescot et al., 2013).

### 5.2.8. Student teachers’ perceptions of email

In terms of communication, student teachers were asked about their preferred method of using technology. Most of the student teachers believed that email is the best ever technology product, and the results showed that all the student teachers had an email address, in addition to the university email. They counted several advantages to this: for example, Nada explained that she had more than one email address as it was such a great invention for connecting people:

*One of its advantages of email is that I can ask my teachers and trainers any question about the courses. All teachers and colleagues have their own email addresses which make communication easier.* [Nada] [focus group interview].

Nada’s comments indicate the utility of email in terms of communicating about educational issues with teachers. Another respondent viewed email as a cost-effective e-learning tool, which connects people with each other to share knowledge:

*With email, I don't have to pay any cost to text my fellows and teachers. It is easily accessible if someone is connected to the Internet.* [Nada] [focus group interview].

Some of respondents expressed their apprehension about using email as the medium of communication due to hacking issues.

*We have a fear of emails being hacked, which cause serious privacy and confidentiality issues, so I don’t trust this medium for frequent communication involving my personal credentials.* [Amgaad] [focus group interview].

It may be that Amgaad had suffered a bad experience with emails as she was looking more at the negative aspects rather than the benefits of it being a communication tool. The results showed that student teachers thought email indispensable during their university and training duration; some student teachers thought that email was the official way to contact work partners, supervisors, managers or institutions like the university or a company. Wafa explained her ideas about the purpose of emails:

*In my opinion, I think emails should be used for professional fields and the messages should be formal. You should also use classical language, not slang.* [Wafa] [focus group interview].

Emails are therefore seen as a communication tool for formal messages and not as a way of communicating with friends. Wafa explained that friends use chatrooms on social media instead. Hada had a similar idea about the purpose of an email and stated that the factor that determines whether an email should be sent to someone is the level of knowledge about the person:

*The communication through email takes place for requesting information about certain things, which can only be provided by the person with the right knowledge.* [Hada] [focus group interview].

Hada’s comments seem to suggest the utility of email in professional settings for requesting data about a particular matter; however, they still do not provide an indication of the use of email for learning and exchanging material to improve skills.

Nevertheless, emails do have their uses, according to Amany:

*You can't send, receive, download files except by emails. Paper handling is so hard and has a very high cost.* [Amany] [focus group interview].

Amany described how emails make it convenient to deal with files, and this is where they have an advantage over other forms of communication. However, many respondents expressed their reservations about using email for formal communication with colleagues and teachers, as Saudi culture is not fit for email communication due to the delays in people replying. This is reflected in Soad’s comments:

*The people in this country are not known for giving quick replies. They take weeks or sometimes more than a month to reply to queries, which delays the process of learning if it is used for learning process.* [Soad] [focus group interview].

Some other respondents reported receiving important messages in their spam folder, which meant they often missed out on key developments in this subject:

*I get tens of anonymous emails every day requesting my bank account number or announcing that I have won a prize and I should click on a link to receive it.* [Nuha] [focus group interview].

Research has shown emails to be an ineffective communication tool for learning purposes due to the overload of information being sent; this means that hours are wasted on dealing with unwanted emails (Vacek, 2014). This makes email a less popular medium for communicating with colleagues and teachers in Saudi Arabia for learning and developing new skills. Other research studies tend to agree with this; Drago (2015) found that technology has a negative effect on the quality and quantity of face-to-face communication. Furthermore, Matusitz (2007) argued that the use of the Internet means that those who may be shy will hide behind the anonymity afforded by the Internet and this will mean they become less competent at communicating with others; the quality of their face-to-face interactions will be diminished. Despite the benefits of email, some of the student teachers expressed doubts about its effectiveness in allowing them to communicate in ways they could interact with others. Taken together, these data suggest that email supports communication and transfer of content are not considered safe. In addition, the issues of delays in communication with teachers and fellow colleagues make it a less popular medium for sharing knowledge among Saudi student teachers.

## 5.3. Student teachers’ perceptions of blogs

The respondents were asked about their perceptions of the role of blogs for supporting students’ learning and communication. Most of the respondents in this study were aware of the positive role of blogs in communication. They were of the view that blogs are useful platforms for befriending experts in the subjects and exchange useful information. One of the respondents expressed her views as follows:

*The blogs are good platforms which allow communication with several experts in the field, if I post any query relating to my subject. However, in my subject areas, there are many blogs which are based in Saudi Arabia.* [Amany] [focus group interview].

Another respondent added:

*The majority of the blogs are managed in English-speaking countries, so they do not offer me a chance to share my experiences with others in a good way, because my problems are specific to my society and education system, which most of experts are not able to understand.* [Wafa] [focus group interview].

Another respondent supported the views of Wafa:

*I could not find any specific or dedicated blog for student teachers to make them more skilled and increase their learning.* [Hada] [focus group interview].

From the above comments, it is clear that the student teachers were aware of the utility of blogs in increasing the amount of communication with many experts in the field to gain better knowledge and understanding of the subject, and sharing experiences with colleagues. However, they might not have had opportunity to use this medium in order to communicate with other people in their subject areas due to the lack of accessibility and experience in using blogs (Yang, 2009) or the prevalence of the traditional approach of learning, such as class-based and teacher-centred learnings (Wheeler, 2010). Another issue reported by them was related to the cross-cultural problem in registering, posting and exchanging thoughts with experts on blogs hosted in other countries, suggesting the limited utility of international blogs for the Saudi student teachers. Some previous studies have also reported the lower frequency of postings and communications from the users belonging to countries with English as their second language (Polanco-Bueno, 2013; Jerles, 2012). Furthermore, all of the respondents suggested the need of blogs for student teachers, as one respondents said:

*I have seen many blogs for medical students in Saudi Arabia, and I know some friends, who always talks of getting solutions of their issues through communicating with their teachers and peers. I wish there should be such a platform for student teachers.* [Hana] [focus group interview].

Another respondent supported the views of Amjad, stating:

*Design and medical faculties in universities in Saudi Arabia provide the facility of blogs and quick solutions for students. I think that blogs provide plenty of space for data sharing, many features to exchange messages in different formats. It can help student teachers a lot.* [Amjad] [focus group interview].

The comments of Hana and Amjad are indicative of the popularity of blogs among students studying medical and design courses. The student teachers in the university in Saudi Arabia that was the context for the study expressed interest in the potential of blogs for improving their knowledge and skills, thereby suggesting the development of a ST-Edublog intervention for improving knowledge-sharing and peer-to-peer and student-instructor communication for achieving and enhancing the training objectives and experience.

Talking about the advantages associated with blogs, many respondents were of the view that blogs are a helpful tool for updating their knowledge, as is evident from Hada’s comments :

*As far as my understanding about the blogs is concerned, they are the best source of getting updates about the new technologies introduced in teachings, and therefore they can be helpful for the professional development of teachers during their training, if they are given such an opportunity.* [Hada] [focus group interview].

Some respondents focussed on the benefit of blogs in problem-solving and knowledge-sharing.

*I have learnt that blogs provide a quick resource for locating someone who can give you help in solving your problems in the area of interest. Being a blogger, I can share my feelings, experiences and problems about my daily practices.* [Nora] [focus group interview].

Based on these data, the respondents of this study showed very positive perceptions of blogs and blogging for expressing their feelings and share experiences. It was felt that such platforms can provide student teachers with plenty of opportunities of professional development, which can be useful for boosting communication.

Many studies have supported the proposition of this study: the development of blogs to make future teachers aware of the flexible pedagogical methodologies and achieve the curriculum goals (Marin-Diaz and Gomez-Parra, 2015; Reupert and Dalgamo, 2011). Jerles (2012) posited that blogs are an effective means of commutation for the student teachers in order to allow them to create a network of experts which facilitates the flow of knowledge freely among members of the network, thereby assisting skills and knowledge development for everyone in the network. Many studies have also reported the use of blogs in motivating the student teachers to learn, express their feelings and experiences about the classroom-based teaching practices, and help them design their teaching tasks effectively (Chong, 2011; Fernandez-Villavicencio, 2010).

## 5.4. Utility of blogs for communication and learning in student teacher education

Based on the results presented in preceding sections, it is evident that though there are several social media platforms such as Twitter, Facebook and Instagram, the student teachers were particularly interested in the potential of blogs as a tool for improving their knowledge and skills development. This indicates that blogs have a potentially higher potential compared to other e-learning tools for student teachers in terms of knowledge-sharing, building competencies and providing a supportive environment for networking with supervisors and peers. Taken together, the perceptions of student teachers were more in favour of blogs for learning, sharing ideas and experiences about their areas of interest, thereby suggesting the positive role which blogs might play to improve the knowledge and skills of student teachers. Many studies have indicated that if blogs are tailored for a specific purpose, they are more productive in terms of achieving the particular goals set by organisations (Chu et al., 2012; Hourigan and Murray, 2010). For example, blogs designed to improve students’ learning, such as interactive whiteboards managed by universities, were found to be effective in motivating students’ participation in and engagement with active discussions and forums to satisfy their curiosities, enhance public expression, and provide an environment for reading and writing (Stoszkowski and Collins, 2017; Farmer et al., 2008). This lays an emphasis on the blogs tailored to users’ needs to maximise their effectiveness and efficiency as an e-learning tool for students and teachers.

## 5.5. Drawbacks of privacy issues

According to comments from student teachers, there is a difference between blogs and other applications. This shows that participants were able to compare more than one platform. One of the issues that participants had with some platforms was related to privacy. As was shown above, Hana was cautious in giving out any personal information via email as she did not trust that information would be kept private. Nada also explained that she had similar issues with Twitter, even though it was a personal account:

*I used to post on my Twitter personal account, but I had a problem when another retweeted one of my tweets, one of the comments on it included a statement of the illegality of post school information on personal accounts. I felt afraid and deleted my tweet.* [Nada] [focus group interview].

Nada had no control over her own account, as others could use her information and share with others. Chan and Virkki (2014) found that females were more likely to share information than males; in addition, few read the privacy notices on social media platforms (Determan, 2012). Although people may feel they are sharing information with friends, and that they are not disclosing too much personal information, combining pieces of such information may reveal sensitive details (Krishnamurthy, 2013). Nada realised that she had made a mistake in revealing details that should have been kept private. Wafa had a similar issue:

*Actually, when I was on my way to school, I posted a video on my Snapchat about a new strategy in teaching I would apply that day and saying that I would give the pupils gifts. But one teacher from the school on my account advised me not to post anything about school on private accounts.* [Wafa] [focus group interview].

This finding is important as it shows how privacy is a very important issue in any culture, but especially in Saudi culture. However, while many have thoughtfully analysed and theorised privacy and technology use, there has been little research that has introduced Gulf-Arab cultural notions of privacy into the conversation, according to Abokhodair et al. (2017). In a study that focused specifically on privacy and social networking in the Gulf States, Faisal and Alsumait (2011) evaluated the nature of privacy behaviours, trust concerns, and attitudes to social media use, in Kuwait. Results showed that a high level of privacy awareness and trust were major factors affecting the means by which Kuwaiti youth participated in social media. Privacy is a high-stake value in collectivist and home-based societies, such as Kuwait, and any violation of privacy leads to shame and loss of face (Abokhodair et al., 2017). It is important to recognise that privacy is rooted in Islamic teaching and is of particular significance in Arab societies. Consequently, the comments by the participants about the privacy afforded them on blogs are encouraging.

Nevertheless, a number of the student teachers had not subscribed to Twitter, as they had concerns about security. This was not especially because of Twitter itself, but because you may be linked to someone whose content may be offensive and others will judge you by that. Chaudhry (2015) has noted that offensive language being used on Twitter can increase racism. However, the authenticity of users was applauded, although Reem said she would not use Twitter because they wanted her telephone number to check her profile and she was reluctant to give out the number, as it was linked to her bank account.

## 5.6. Summary

From the findings it appears that at the start of the study, the students felt that blogs could serve as an exceptionally useful framework by which they could easily enter into a mutually beneficial social collaboration and conversation; in turn, this conversational approach and sharing of information could act as a data-gathering source through the app itself. They were more positive about the use of learning tools in classrooms that the other social computing applications they had encountered. This provided an important framework for the rest of the study, as it indicated that the development of an Edublog could be of value in this context. The next chapter will present the development and implementation stage of the student teachers-Edublog (ST-Edublog), undertaken in order to increase the level of skills development and knowledge sharing among student teachers. Finally all the student teachers comments as mentioned in the above section related to focus group discussions.

# CHAPTER SIX

# STUDENTS’ EXPERIENCES OF, AND RESPONSES TO, THE ST-EDUBLOG

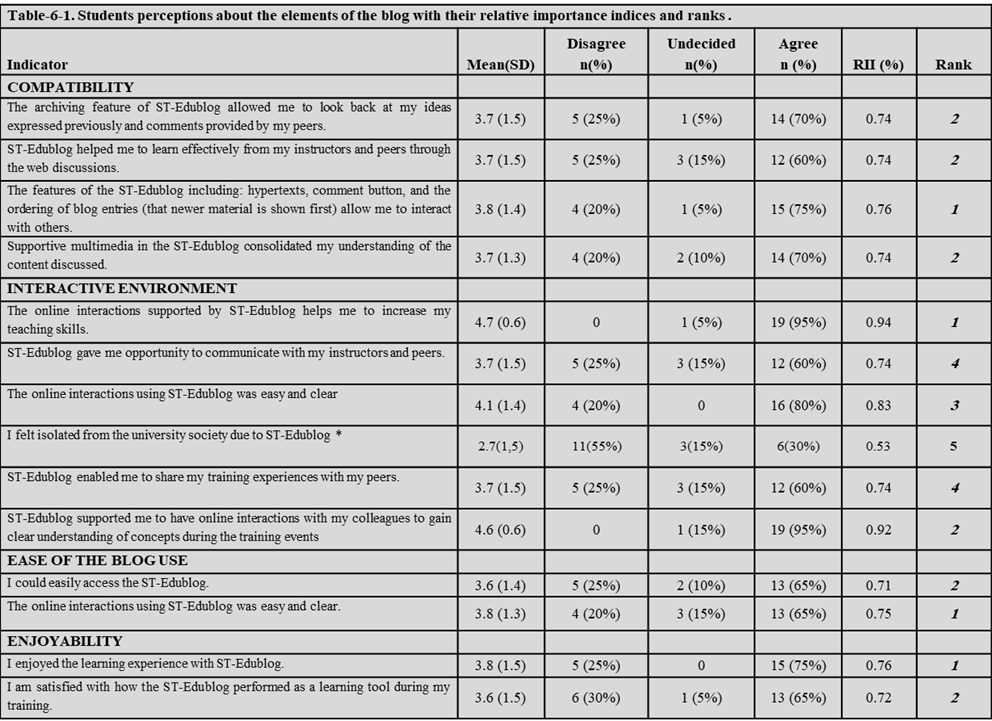
## 6.1. Introduction

This chapter outlines ST-Edublogs’ potential to improve ease of use, perceived enjoyment, compatibility and intercative environment. The impact of ST-Edublog on teachers’ skills and knowledge is reported in this chapter. Previously, in Chapter Five, the perceptions of student teachers about the use of social media platforms such as Facebook, blogs, Snapchat, Twitter and Instagram were explored, which showed the interests of student teachers in using blogs rather than the other forms of social media to resolve any issues related to their education and training. This indicated that blogs have a potential to be used as a vehicle to improve the learning experience of student teachers during their training. This chapter outlines the results of the post-implementation surveys of the proposed ST-Edublog, analysed alongside data from the focus group discussions, and reflective diaries. This chapter outlines findings in relation to two of the sub-research questions:

* How did Saudi student teachers perceive the ease of use, usefulness, compatibility, enjoyability and interactive environment of the blog used in the Edublog project?
* What impact did the blog have on student teachers’ development of skills and knowledge?

As outlined in the methodology chapter, in order to address the afore-mentioned research questions, data were collected using post-implementation surveys; subsequently, these data were subject to the appropriate statistical methods according to each variable, depending on the number of the group in question. Student teachers’ responses were imported into an Excel sheet and were analysed using the SPSS program and Excel. Means, standard deviations and percentages were used to describe the scores for the Likert-scale items. The numbers and percentages were utilised to describe the categorical variables, tables were employed to summarise data.

The data were also analysed using the partial least squares method. This method was selected because of its flexibility and the minimal restrictions it places on the residual distribution, participant numbers and type of measurement (Hair et al., 2010) (Hair et al., 2011). The partial least squares method was completed in two phases: measurement model assessment, and construction of structural equation models. The measurement model assessment was performed by assessing the reliability of items associated with each construct in (Table 6-1) .



For this purpose, item loading is considered a useful measure for reliability of individual items. Hair et al. (2011) suggested that the value of item loading equal to or greater than 0.7 on the expected latent variable is considered statistically reliable. Table 6-2 outlines those responses to Third survey questions that, using this approach to statistical analysis, were considered statistically reliable.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Table 6.2: Summary of data obtained for different items across each construct** | | | | | | | |
| **Constructs** | **Item no.** | **Description of item** | **DA** | **UD** | **AG** | **Mean (SD)** | **Item loading** |
| **Perceived enjoyment** | PENJ-1 | I enjoyed the learning experience with ST-Edublog. | 25% | 0 | 75% | 3.8 (1.5) | 0.82 |
| PENJ-2 | I am satisfied with how the ST-Edublog performed as a learning tool during my training | 30% | 5% | 65% | 3.6(1.5) | 0.72 |
| **Perceived**  **ease of use** | PEOU-1 | I could easily access the ST-Edublog. | 25% | 10% | 65% | 3.6 (1.4) | 0.81 |
| PEOU-2 | The online interactions using ST-Edublog was easy and clear | 20% | 0 | 80% | 4.1 (1.4) | 0.85 |
| **Perceived usefulness** | PUNS-1 | ST-Edublog helped me to learn effectively from my instructors and peers through the web discussions | 25% | 15% | 60% | 3.6 (1.5) | 0.74 |
| PUNS-2 | ST-Edublog gave me opportunity to communicate with my instructors and peers | 25% | 15% | 60% | 3.7 (1.5) | 0.79 |
| **Perceptions of interactive enviroment** | POIE-1 | I felt isolated from the university society due to ST-Edublog | 55% | 15% | 30% | 2.7 (1.5) | 0.71 |
| **Perceived impact on learning** | PIOL-1 | ST-Edublog enabled me to share my training experiences with my peers. | 5% | 10% | 85% | 4.3 (1) | 0..82 |
| PIOL-2 | The online interactions supported by ST-Edublog helps me to increase my teaching skills. | 0 | 5% | 95% | 4.6 (0.6) | 0.84 |
|  | PIOL-3 | ST-Edublog supported me to have online interactions with my colleagues to gain clear understanding of concepts during the training events | 0 | 5% | 95% | 4.6 (1.4) | 0.89 |
| **Perceived compatibility** | PCOMP-1 | The features of the ST-Edublog including: hypertexts, comment button, and the ordering of blog entries (that newer material is shown first) allow me to interact with others. | 20% | 5% | 75% | 3.8 (1.4) | 0.91 |
| PCOMP-2 | The archiving feature of ST-Edublog allowed me to look back at my ideas expressed previously and comments provided by my peers. | 25% | 5% | 70% | 3.7 (1.5) | 0.75 |
| PCOMP-3 | Supportive multimedia in the ST-Edublog consolidated my understanding of the content discussed. | 20% | 5% | 70% | 3.7 (1.3) | 0.91 |

These data were analysed in tandem with the data from the focus group interviews, and these data are integrated into the analysis where appropriate. In the first section of data analysis, I focus on the extent to which the students enjoyed using, and gained satisfaction from, using the blog.

## 6.2. Levels of perceived enjoyment in using the blog

The participants showed whether they agreed or disagreed with the following statement: *I enjoyed the learning experience with ST-Edublog*. Most of the participants (N=15, 75%) agreed with the statement, while the other five students (25%) showed their disagreement. The pleasant experience of learning with ST-Edublog had a collective mean agreement rating equal to 3.8 out of a possible score of five on the Likert-type scale, which was closer to agreement.

These findings suggested that, as a learning tool, ST-Edublog enhanced the learning experience of the student teachers. The improvement in the learning experiences among student teachers might be attributed to several reasons. It might be related to the contents and design (interactive environment) of ST-Edublog or the competencies of users becoming increased following the use of ST-Edublog, as is explored in this chapter. Amir et al. (2011) reported that the interactivity feature generates a positive influence in enhancing the users’ enjoyment of blogs, which is in line with the data produced by this study. Many other studies have reported similar findings to support the connection between a pleasant learning experience and the interactive environment of blogs created for educational purposes for both teachers and students (Kang et al., 2011; Rodrigues et al., 2011; Yang and Chang, 2012).

Several studies have linked technological competency with the overall enjoyment experienced by teachers and students while using blogs (Arnold and Ducate, 2015; Goktas and Demirel, 2012; Hanson-Baldauf, 2009; Countinho, 2007). For instance, Goktas and Demirel (2012) showed that blogs were helpful in making the learning experience more pleasant for the prospective teachers of learners through increasing their technological competencies. They further showed that technologically competent prospective teachers were found to enjoy their learning experiences, which corroborates the outcomes of this study.

The participants were also asked to respond to the following statement: *I am satisfied with how the ST-Edublog performed as a learning tool during my training*. The majority of participants (N=13, 65%) were satisfied with the ST-Edublog project as a learning tool. Another six (30%) participants were not satisfied with ST-Edublog as a learning tool. The remaining participant (5%) remained ‘undecided’ about the statement. The satisfaction of student teachers with ST-Edublog as a learning tool had a collective mean agreement rating equal to 3.6 out of a possible score of five on the Likert-type scale, which was closer to agreement.

Wolf (2010) reviewed the effectiveness of blogs as learning tools for the students of public relations and found that blogs significantly increased the satisfaction of students in terms of acquisition of reflective practices through exchanging knowledge via the reflective blog. Alshareef (2013) showed that students were satisfied with the role of educational blogs in enabling them to create content, share knowledge and experiences, and obtain support from their peers. Another study conducted by Cakir (2013) reported similar findings, whereby students were satisfied with the learning experience and engagement with educators provided to pre-service teachers through the use of blogs. Many other studies showed the effectiveness of blogs in increasing the satisfaction of students and teachers with the experience of learning concepts and sharing knowledge (Banerjee, 2011; Keengwe et al., 2012; Ifnedo, 2017). These data are consistent with the finding of this study.

## 6.3 Ease of use

The respondents to the study expressed their views about the ease of use of ST-Edublog for sharing knowledge and experiences among themselves. As the data in relation to Survey Items No. PEOU1 and 2 in Table 6-2 indicate, the students felt that the blog was easy to use. The participants in this study were asked whether they agreed or disagreed with the following statement: *I could easily access the ST-Edublog* (Figure 6.2). Most of the participants (N = 13, 65%) were of the view that they could easily access the contents of the ST-Edublog, while five (25%) said that they were not able to access the contents of the ST-Edublog, they justified their un acceccability or difficulties in accessing the ST-Edublog during the focus groups interviews due to their shortage of time, family and home responsibilities, and rarely network weakness. The participants were also asked to express whether they agreed or disagreed with the following statement using the five-point Likert scale: *the online interactions using ST-Edublog were easy and clear*. The majority (N = 16, 80%) of participants agreed with the statement, while four participants (20%) were of the view that the online interactions supported by the ST-Edublog were not easy and clear to them.

The ease of use, in terms of users having easy accessibility to data and blog functions is reported to play an important role in mediating effective communication among users (Wu and Wu, 2011). Avci and Askar (2012) also reported that users in their study perceived the ease of use helps them to share ideas and express their feelings and emotions using various signs, letters and language patterns which are recognisable by users living in a specific territory.

The easy accessibility of information and functions on blogs lays the foundation for a good learning environment, as it is vital to publish a variety of activities on blogs such as reflection, critical thinking, discussion and questioning (Hafiz Zakaria et al., 2010). Users with expertise in using different blog functions have a better opportunity to promote critical thinking, initiate discussions and respond to the queries of other users, thereby modelling discussions, critical thinking and reflections through the use of blogs (Popescu, 2010; Infinedo, 2017). Taken together, it can be concluded that the student teachers who showed that they could use ST-Edublog and access the functionalities and data with ease were more likely to benefit from the ST-Edublog Project in terms of resolving problems, promoting critical thinking and developing skills through sharing of experiences and other useful data from various resources.

Though a percentage of student teachers were unable to access the key contents and functions of the ST-Edublog project, this might be related to them spending less time communicating with peers. Chen et al. (2015) argued that students spending less time on the blogs to communicate with their peers experienced difficulty in terms of accessing the different blog functionalities. Although blogs are not complicated applications, they still require considerable time and training before users become familiarised with different functions, and it is highly important to use blogs in an expert manner (Balakishnan, 2014).

Another study concluded that easy interactions with peers and teachers on academic blogs are the precursor to the learning and sharing of knowledge in a holistic and heuristic fashion (Zain and Koo (2016). Aydin (2014) gave the view that easy interactions, enabled by blogs designed for that specific purpose, are necessary for implementing the blogs effectively in the community of practice. Similar results were provided by Sidek and Yunus (2012), suggesting the blogs do achieve the desired learning objectives. Many other studies have supported the ease of use in terms of clear and easy interactions with peers that are necessary for increasing the effectiveness of blogs and increasing the intention to use (Miangah and Nezarat, 2012; Byington, 2011). These data corroborate the outcomes of this study.

There were various features of the blog that students enjoyed. The ST-Edublog was comprised of different kinds of tools that connect its members with ease, much like any other social media app, and contained many different functions. One function is that any user can send messages to another user in the form of an online discussion, allowing them to exchange their thoughts and views more easily with other users. One student, Noah, noted that:

*The design and features of ST-Edublog were good and enabled me to quickly post questions related to my academic syllabus to my colleagues on ST-Edublog.*  [Noah] [focus group interview].

Blogging can only be useful when the quality questions are posted by users, to which appropriate answers can be sought. High quality questions were defined as those that enable a learner to comprehend the task (Pedrosa de Jesus et al., 2003), which shows the importance of having an effective learning environment that encourages questioning. It is not just the questions student teachers using ST-Edublog ask, but also the questions they need to answer that Edublog helps with, giving them reassurance in their ability to deal with such situations. Noah knew she needs to be prepared for questioning from her students and ST-Edublog helped her to write questions and obtain the satisfactory answers from peers, indicating the response of student teachers to queries posted by other student teachers.

Furthermore, the ST-Edublog application includes the vital function of uploading comments; this was probably the most important tool or service it offered, according to Sana:

*I can express my thoughts, ask questions, respond to them, add comments and engage in discussions easily with my colleague.* [Sana] [focus group interview].

This makes it clear that student teachers can quickly engage in real interactions through the ST-Edublog application with the aid of the comments box. The comments box enables them to post questions, comments and suggestions, and give feedback and, in turn, it also provides them with solutions to their problems. According to this feedback, they can quickly enhance and improve their teaching skills using the blog and update their knowledge.

The ST-Edublog application also contained a homepage, with a clear layout, where student teachers were able to access and read contents effortlessly, once they had logged in. The homepage and clear layout features enabled the respondents to be part of the academic community on ST-Edublog, as noted by Fatima:

*Sharing my views related to different types of social, teaching skills or academic topics motivated me to be part of an academic society.* [Fatima] [focus group interview].

Hence Fatima was able to join in the debates and discussions run by the academic community, which consequently motivated her to interact and share her own points of view. Benabou and Tirole (2000) explain how social interactions can have a significant impact on the self-confidence of an individual; this is especially so when the others involved are colleagues or close to the individual, as people draw inferences about themselves from the behaviour of others. In Fatima’s case, sharing her views with others who respected those views gave her sense of ownership in the academic community, and enabled her to be more creative in her thinking. Furthermore, by interacting with her colleagues on an equal basis, Fatima find her need to belong is satisfied and, as Leary and Baumeister (2002) argue, once this need for social inclusion is satisfied, it leads to an individual having higher self-esteem.

Generally, participants felt more comfortable when using an online portal such as Edublog to ask questions and share their views, compared to traditional methods; this is because they might feel intimidated in a classroom environment (Conklin, 2013). When using the app correctly, student teachers can confidently share their thoughts and feelings in the form of a blog; alternatively, they can share or ask the questions they want to, seeking the advice and help of more experienced student teachers by posting comments on their blogs (Falloon, 2011).

From there, they can easily obtain the information they need — information related to their queries — in the form of answers. Most student teachers can frequently post across different comments in different communicative forms and can continue querying and receiving feedback in the form of comments thereafter. This stimulates their minds, and, in turn, allows them to overcome their shyness and hesitation to ask questions in the classroom, which can be a serious problem in a teaching situation. In turn, this increases student teachers’ confidence (Palloff and Pratt, 2007; Allan and Clarke, 2007).

Taken together, the features of the ST-Edublog app allowed student teachers to improve their knowledge and provided an opportunity by which student teachers could learn new activities that would help them to think ‘outside the box’ and about subjects and information that may not be strictly related to the academic syllabus in question. This is in line with the affordances of Web 2.0, which allows people to collaborate and become actively involved in content creation. They further posited that Edublogs allows the users to generate knowledge and to share information with other individuals online. Web 2.0 platforms are perceived to have an emerging role regarding the transformation of teaching and learning practices and methods (Alexander and Levine, 2008).

## 6.4 Perceived usefulness

The statement, *ST-Edublog helped me to learn effectively from my instructors and peers through the web discussions*, was presented to the participants for this study to tally the numbers that either agreed or disagreed with it. The majority of the participants (N = 12, 60%) agreed that the ST-Edublog was useful in enabling effective learning processes picked up from instructors and peers, while 25 percent of participants (N = 5) could not agree with the statement. The remaining 15 percent of participants (N = 3) remained undecided.

The participants were also asked whether the ST-Edublog helps them to communicate with their instructors and peers. They were presented with the following statement in order to show agreement or disagreement: *the ST-Edublog gave me opportunity to communicate with my instructor and peers*. The majority of the participants (N = 12, 60%) agreed with the statement, while 25 percent of participants (N = 5) could not agree to the usefulness of the ST-Edublog in allowing them to effectively communicate with their peers and instructors. The final 15 percent of participants (N = 3) remained undecided.

Miyazoe and Anderson (2010) produced findings in line with this study, showing that the application of online discussion forums, blogs and wikis was helpful in increasing the writing abilities of students participating in learning English as foreign language. The blogs were used by students to control their personal learning environment, as they provide users with the ability to choose who they can connect with in order to enhance their learning and knowledge (Dabbagh and Kitsantas (2012). They reported that blogs were found to be useful for students in both formal and informal learning in the self-regulated environment of social media.

Hamdi et al. (2015) showed that students in Australian and Malaysian universities perceived the usefulness of the blogs for interacting with students and teachers in order to enhance their learning about particular topics. They concluded that blogs contribute to the online learning of students, regardless of their level of study, through student-student and student-teacher engagements. Similarly, Lee and Bonk (2016) reported that students agreed that the application of blogs was useful in contributing towards increasing their online learning and emotional closeness with their colleagues and teachers. The students also found the adoption of the blogging technology was important for expanding their knowledge and gaining experiences beyond their class-based learning.

Aydin (2014) conducted a review of articles on the use of blogs to increase the learning experiences of blogs on English as a foreign language. They showed that most of studies supported the use of blogging in order to increase the online learning skills of students in the domains of writing. Top et al. (2012) demonstrated the positive association between online collaborative learning and blogging among pre-service teachers. They concluded that student teachers with sufficient computer skills demonstrate a higher ability to learn through positive engagement with peers and teachers. Several other studies have supported the positive perception of students and teachers of the role of blogging in increasing their knowledge and aiding their professional development (Grassley and Bartolleti, 2009; Zhang, 2009; Al-Fadda and Al-Yaha, 2010; Tang and Lam, 2014; Kitchakarn, 2013).

The data also showed that ST-Edublog is useful in supporting the communication network of student teachers with their instructors and colleagues. Blogging is the online learning technology considered an important pillar of communication within the community of practice. Baldea et al. (2015) discussed the importance of blogs as a communication tool which helped teachers to provide feedback on the assignments and other learning materials. The instant nature of messaging is very useful in that it accelerates the feedback to, and thereby learning of, students.

The exchange of advice and consultation between users also helped them to shift to more resourceful blogging platforms. Yang et al. (2009) evaluated the effectiveness of the blogs in enhancing the communication of students with peers and teachers. They found that blogging motivated the student to communicate with teachers, and this communication played a positive role in the professional development of student teachers, taking the form of active discussions of problems, teachers posting solutions to the problems, and discussions of teaching theories and their implications for classroom-based teachings. Yang et al. (2009) further reported the utility of blogging platforms in enhancing the reflection and communication between language students and their teachers.

Lai et al. (2010) investigated the factors affecting the adoption of the blogs, and found that communication was an important motivation to use the blogs for learning purposes. Chu et al. (2012) reported that nurses during internship used blogs to communicate their experiences and emotions with peers. They further revealed that nurses were found to be engaged with writing and reading blogs, and regarded blogs as a source of knowledge construction. Another study concluded that blogging is a useful instrument for promoting the communication of students with their peers and teachers, which help promote knowledge-sharing, problem-solving, and reflection (Hamid et al., 2015).

Life has become busy, and students have other distractions, such as spending time with family and friends. At the same time, technologies have greatly impacted on the dynamics of time and space. With the help of blogging, communication between peers, friends, and tutors has revolutionised the way people learn from each other (Bakar, 2009). Thus, it can be argued that ST-Edublog could be a vital tool for promoting communication between student teachers and peers and instructors, which might subsequently be used to improve the knowledge and professional development of student teachers in Saudi Arabia. These results were supported by the qualitative data presented in section 7.2.5, when student teachers perceived that blogs are communication tools which can add value to their professional development by sharing experiences with peers.

## 6.5 Perceived compatibility

The respondents to the study expressed their opinions about the archiving features and supportive multimedia for making the peer-to-peer intercations effective. As the data in relation to Survey Items No. PCOMP1, PCOMP2 and PCOMP3 in Table 6-2 indicate, the students perceived that computability of ST-Edublog’s features enhanced their intercative experiences. The participants were asked to express their opinions about the following statement on the five-point Likert scale: *the features of the ST-Edublog including hypertexts, comment buttons, and the ordering of blog entries (so that newer material is shown first) allow me to interact with others*. The majority (N = 15, 75%) of participants agreed with the statement, while 20 percent (N = 4) disagreed about the adequacy of the current features of ST-Edublog in enabling interaction with their peers. The other five percent of participants (N = 2) remained ‘undecided’ about the statement.

The participants also expressed whether they agreed or disagreed with the following statement: *the archiving feature of ST-Edublog allowed me to look back at my previously expressed ideas and comments provided by my peers*. Most of the participants (N = 14, 70%) were of the view that the archiving feature of ST-Edublog was helpful in allowing them to look back at posts/comments posted previously by their peers. However, 25 percent of the participants (N = 5) could not agree with the statement, while one participant (5%) remained neutral about the statement.

Furthermore, the participants in this study were asked to show whether they agreed or disagreed with the following statement: *supportive multimedia in ST-Edublog consolidated my understanding of the content discussed*. Most of the participants (N = 14, 70%) were of the view that supportive multimedia in ST-Edublog did consolidate their understanding of the content discussed. Nevertheless, 20 percent of the participants (N = 4) could not agree with the statement, while 10 percent of participants (N = 2) were undecided about it.

Based on these results, it can be concluded that a majority of student teachers thought that the different features of blogs such as comment buttons, hypertext options and sequential entries based on the dates of posts were useful to allow them to make effective interactions with their peers. Zhang et al. (2009) noted that hypertext options in blogs are critical for enabling effective and rapid communications with peers. Student teachers do not need to email the required material to their colleagues, instead they can add hyperlinks to the blogs through which their peers can directly access the required resources. Due to the availability of hypertexts, communication becomes more interactive and dynamic among users (Abdelmalak, 2015).

In addition, the comment button is considered a useful option on blogs, which enables users to put blog entries in a more informal and narrative form. This creates the impression of discussion on different issues among users (Huang et al., 2011). Users not only post their comments, but they also receive appreciation or criticism of them. This interactive process is not available via email, which makes ST-Edublog unique in terms of rapid communication, knowledge-sharing, and problem-solving for student teachers (Grassley and Bartoletti, 2009).

The ordering of communicated data on blogs is another useful feature, which allows users to build archives and arrange data by the time and date on which the information was exchanged between users (Ducate and Lomicka, 2008). This feature is essential for accessing data quickly, which makes the process of cross-referencing quick and easy (Zhang et al., 2009). The presence of this feature on ST-Edublog for quick and easy communication is paramount, which highlights the unique and interactive nature of ST-Edublog.

Based on these data, it can be argued that the archiving feature is a useful feature in ST-Edublog for increasing the compatibility of this blog with the communication needs of student teachers. Several studies have provided empirical evidence in line with the outcomes of this study. For example, Hsu et al. (2008) have pointed to the usefulness of the archiving feature for the facilitating, adoption and increased use of blogs designed for academic or learning purposes. Wheeler and Lambert-Heggs (2009) found that the archiving feature in learning blogs helped students to browse older entries in order to cross-reference or learn more about the specific subjects discussed. They further reported that the archiving feature motivated users to reuse learning blogs. Another study found that archiving features promoted a positive attitude towards learning through increasing engagement with creative community members (Byington, 2011). Some studies have argued that the archiving feature plays an important role in sustaining the positive learning in the community of practice around learning blogs (Arena, 2008; Rollett et al., 2007).

Some studies have noticed the archiving feature built into the learning blogs is useful for increasing the time spent on reading and replying to posts (Pursel and Xie, 2014). This spurs creative activities, motivating users to engage in creative and problem-solving learning processes. In addition, time spent on using blogs enhances the knowledge-building process as the users interact with each other through holding positive discussions, sharing experiences and learning from each other (Miceli et al., 2010; Arnold and Paulus, 2010).

The study conducted by Miangah and Nezarat (2012) on mobile blogging systems reported that supportive multimedia components in blogs is a key ingredient that enables users to share their audio and video clips. In the context of student teachers, they can use this facility to upload a variety of multimedia content relating to their training and teaching experiences, which are helpful in increasing the effectiveness of ST-Edublog. Livingstone et al. (2008) suggested that multimedia features are essential for collaborative learning blogs, which shape the learning attitudes of users. Furthermore, the motivation of students and teachers regarding the use of blogs for academic purposes depends on the ability of the blogging system to support messaging with other users in the forms of pictures, audio clips, and videos (Ifinedo, 2017; Robertson, 2011).

The presence of multimedia support for learning and knowledge-sharing in the collaborative learning setting facilitates the interactivity of the blogging system, and enables users to exchange more reliable and understandable context-based learning examples (Sidek and Yunus, 2012; Zain and Koo, 2016). Sullivan and Longnecker (2014) linked the facility of multimedia components of a blogging system to convenient and useful illustration of complex concepts which otherwise could not be expressed in the form of articles or essays. Therefore, these studies suggest that multimedia components in a blogging system is critical for fulfilling users’ needs to exchange correct and easily digestible information with other users.

The interview data provided support to the quantitative data, and percpetions of student teachers viewed that ST-Edublog comprised of different kinds of tools that connected its members with ease, much like any other social media app, and contains many different functions. One function is that any user can send messages to another user in the form of an online discussion, allowing them to exchange their thoughts and views more easily with other users. Noah noted:

*The design and features of ST-Edublog were good and enabled me to quickly post questions related to my academic syllabus to my colleagues on ST-Edublog.*  [Noah] [focus group interview].

The blogging can only be useful when the quality questions are posted by users to which appropriate answers can be sought. High quality questions were defined as those that enable a learner to comprehend the task (Pedrosa de Jesus et al., 2018), which shows the importance of having an effective learning environment that encourages questioning. It is not just the questions student teachers using ST-Edublog ask, but also the questions they need to answer that Edublog helps with, giving them reassurance in their ability to deal with such situations. Amal knows she needs to be prepared for questioning from her students and ST-Edublog helped her to write questions and obtain the satisfactory answers from peers, indicating the response of student teachers to queries posted by other student teachers.

Furthermore, the ST-Edublog application includes the vital function of uploading comments; this was probably the most important tool or service it offered, according to Sana:

*I can express my thoughts, ask questions, respond to them, add comments and engage in discussions easily with my colleague.* [Sana] [focus group interview].

This makes it clear that student teachers can quickly engage in real interactions through the ST-Edublog application with the aid of the comments box. The comments box enables them to post questions, comments and suggestions, and give feedback and, in turn, it also provides them with solutions to their problems. According to this feedback, they can quickly enhance and improve their teaching skills using the blog and update their knowledge.

The ST-Edublog application also contained a homepage, with a clear layout, where student teachers were able to access and read contents effortlessly, once they had logged in. The homepage and clear layout features enabled the respondents to be part of the academic community on ST-Edublog, as noted by Fatima:

*Sharing my views related to different types of social, teaching skills or academic topics motivated me to be part of an academic society.* [Fatima] [focus group interview].

Hence Fatima was able to join in the debates and discussions run by the academic community, which consequently motivated her to interact and share her own points of view. Benabou and Tirole (2000) explain how social interactions can have a significant impact on the self-confidence of an individual; this is especially so when the others involved are colleagues or close to the individual, as people draw inferences about themselves from the behaviour of others. In Fatima’s case, sharing her views with others who respected those views gave her sense of ownership in the academic community, and enabled her to be more creative in her thinking. Furthermore, by interacting with her colleagues on an equal basis, Fatima find her need to belong is satisfied and, as Leary and Baumeister (2000) argue, once this need for social inclusion is satisfied, it leads to an individual having higher self-esteem.

Generally, participants felt more comfortable when using an online portal such as Edublog to ask questions and share their views, compared to traditional methods; this is because they might feel intimidated in a classroom environment (Conklin, 2013). When using the app correctly, student teachers can confidently share their thoughts and feelings in the form of a blog; alternatively, they can share or ask the questions they want to, seeking the advice and help of more experienced student teachers by posting comments on their blogs (Falloon, 2011).

From there, they can easily obtain the information they need — information related to their queries — in the form of answers. Most student teachers can frequently post across different comments in different communicative forms and can continue querying and receiving feedback in the form of comments thereafter. This stimulates their minds, and, in turn, allows them to overcome their shyness and hesitation to ask questions in the classroom, which can be a serious problem in a teaching situation. In turn, this increases student teachers’ confidence (Palloff and Pratt, 2007; Allan and Clarke, 2007).

Taken together, the features of the ST-Edublog app allowed student teachers to improve their knowledge and provided an opportunity by which student teachers could learn new activities that would help them to think ‘outside the box’ and about subjects and information that may not be strictly related to the academic syllabus in question. This is in line with the affordances of Web 2.0, which allows people to collaborate and become actively involved in content creation. They further posited that Edublogs allows the users to generate knowledge and to share information with other individuals online. Web 2.0 platforms are perceived to have an emerging role regarding the transformation of teaching and learning practices and methods (Alexander and Levine, 2008).

The foregoing data support the value of ST-Edublog properties in enhancing interactive communication such as the comment button, hypertext options and sequential entries based on dates of posts. Student teachers expressed their satisfaction capability of such features to fulfil their needs for communication with peers. Based on the afore-presented data, it can be argued that archiving feature in ST-Edublog helped the student teachers to find older posts, share old information and use past entries to reference their discussions. Based on the literature, the archiving feature can also play a positive role in increasing the engagement of student teachers with each other, so that knowledge and experiences can be shared. These factors can be important for student teachers as they spend more time on ST-Edublog in order better learn from it and share knowledge with each other.

In the context of this study, it can be argued that the ST-Edublog might serve as an effective tool to satisfy a variety of the communication needs of student teachers. It may also be utilised as a mobile and collaborative system in order to build professional networks of student teachers, so that they can exchange all forms of data instantly, regardless of time and space constraints. In addition, blogs may further the relatability element of SDT if designed effectively, therefore, it was important to find out whether the ST-Edublog- mediated interactions encouraged student teachers to develop the sense of community. The next section presents the quantitative and qualitative data regarding the students’ perceptions of the interactive environment of the blog.

## 6.6 Perceptions of the interactive environment

The participants were asked whether the ST-Edublog created a sense of community among them. They expressed their views in relation to the following statement: *I felt isolated from university society due to ST-Edublog*. The majority of participants (N= 11 -55%) disagreed with the statement, while six (30%) of them agreed. The remaining 3 (15%) of participants were ‘undecided’ about the statement. Therefore, the sense of community with ST-Edublog had a collective mean agreement rating equal to 2.7 out of a possible score of five on the Likert-type scale, which was close to agreement.

Qualitative data from reflective diaries and focus group interviews also indicated that student teachers experienced being a part of a learning community at the selected university while using ST-Edublog. For example, Sara expressed that ST-Edublog brought her closer to her peers after the exposure to ST-Edublog.

*ST-Edublog allowed me to be connected with my peers, and our coordination with each other was instant and fast. I felt like being part of the community of learners, as I could turn to ST-Edublog-based community to find the solutions of my problems.* [Sarah] [focus group interview].

Another participant supported the views of Sara, and added:

*I could see the problems faced by my peers through discussions on the ST-Edublog. My peers gave me feeling that I am part of learning community, and new topics posted on the ST-Edublog help me build my teaching skills*. [Noah] [focus group interview].

A sense of community was developed and knowledge was produced as a result of interactions on ST-Edublog:

*Before we used to contact through some other tools such as whatsapp or Facebook, however, all student teachers could not participate in discussions on other social media platforms. ST-Edublog brought us together, and shared useful knowledge with each other. This gave me feeling of being in a family while learning from each other.* [Rana] [focus group interview].

From the above comments, it is clear that ST-Edublog was effective in producing a sense of community among the student teachers, and students with same or similar problems could benefit from the knowledge and experiences shared by few users. Therefore, findings from both the quantitative and qualitative data suggest that ST-Edublog played an important role in enabling student teachers to feel part of university society. They felt that that they were integrated into the society due to the connectivity offered for student teachers through the application of the ST-Edublog project.

Kilic and Gokdas (2014) argue that the experiences of users after using blogs make them feel integrated into both the online community and offline community, and this is called a sense of community. More than half of the participants felt that they had become integrated into university society, which indicated that the ST-Edublog project was helpful in introducing them to it. The role of blogs in increasing the sense of community and the integration of the students with their peers had been reported by many other studies (Kilic and Gokdas, 2014; Jimoyiannis and Angelaina, 2012), which support the findings of this study. These studies have shown that blogs were useful in motivating the students to learn in groups and share their experiences as part of learning teams. The interactions and collaborations are the key useful factors resulting from the use of blogs in education, which has improved the performance of language learners (Noytim, 2010; Amir et al., 2011).

However, approximately half of the participants still felt that they were isolated from university society, which was indicative of the fact that they neither responded nor were able to interact effectively with their peers through the ST-Edublog. Kang et al. (2011) reported that a sense of community among blog users can only be made possible when the potential for collaboration and interactivity is increased by the adoption of blogs in the educational setting. The sense of isolation among student teachers might have been caused by the low level of collaboration and interactions with their peers or the lower activity in response to the posts and entries of peers, or vice versa. This explanation seems more plausible, as the results from the post-implementation survey in section 6.4 in Chapter 6 showed that there was not 100 percent participation of student teachers in responding to the posts on ST-Edublog platform, through there was an increase in activity of adding comments to the entries posted by peers compared to the pre-implementation survey.

Some studies have reported that blogs could not motivate all students studying different subjects, equally, which would be due to the variations in learning demands of different subjects (Halic et al., 2010; Ellison and Wu, 2008; Shih, 2010; Li et al., 2013). For example, science students have subjects with practical issues, and they find the blogs as useful sources of possible solutions to their practical issues (Sawmiller, 2010; Benedict and Pence, 2012). However, students of social sciences have theoretical issues, which exert less pressure on them to learn from others (Shih, 2010; Noytim, 2010; Saeed et al., 2009). These reasons can be important factors that contribute to a lower level of activity among student teachers on ST-Edublog, leading to a sense of isolation among them. These data corroborate the outcomes of this study. In addition, in-depth studies along this line can reveal the factors causing the sense of isolation among student teachers.

According to Kim et al (2011), sense of community increases reladedness and connectennity among the users of social media platforms, which leads to development of learning and new skills which is collectively termed as professional development. The next section will reveal data regarding the impact of ST-Edublog on the learning and skills development of student teachers.

One of the key motives in implementing the project was to develop students’ learning in relation to their becoming a teacher. Findings in relation to this aspect of the study are outlined in the next section.

## 6.7 Perceived impact on learning

### 6.7.1 Impact on concept development

After being exposed to ST-Edublog, student teachers were of the view that they obtained a thorough understanding of the central topics covered therein. The participants were asked whether the ST-Edublog supported online interactions and helped them to gain a clear understanding of concepts during their training events. They recorded their views regarding the following statement: *the online interactions supported by ST-Edublog were useful for gaining a clear understanding of concepts during my training at schools*. The majority of participants (N=19 -95%) stated that the availability of ST-Edublog was a useful aid for them to gain a clear understanding of concepts during their training at schools. The other participant (5%) remained ‘undecided’ about the statement. The student teachers’ responses about the impact of ST-Edublog on concept development secured a collective mean agreement rating equal to 4.6 out of a possible score of five on the Likert-type scale, which was closer to strong agreement.

In addition to enabling them to gain knowledge about education, the blog also developed students’ knowledge in relation to other areas, for example grammar: According to Afnan:

*I can obtain accurate and effective knowledge from writing on the blog app, such as grammar and sentence structure - since I can easily attain real knowledge through interaction with peers.* [Afnan] [focus group interview].

Afnan found that the ST-Edublog project helped them to improve their grammatical knowledge, as she could read what others had written and thus obtain accurate information about the correct terminologies in their queries. The writing style of student teachers was quite typical in that they took an interest in using the blogging app as an online platform; as has been seen in their use of social media, the medium acts as a persuasive element. To teach something new, student teachers utilised the ST-Edublog project effectively and found it helpful for interacting with others, collaborating with peers and learning about the topics and subjects taught in the classroom. Consequently, this project helped respondents to improve their teaching skills and to read detailed explanations of topics raised by their pupils in the educational field. As student teachers could easily obtain the correct information, they could plan their future lessons to greater effect, thereby assuring them of definite success, as Amal noted:

*I can easily get a good idea of the different fields of study and other relevant information. The most important thing is that I can clearly elaborate on a particular subject by preparing my lessons using good, sound knowledge.* [Amal] [focus group interview].

Afnan was able to gather support from ST-Edublog:

*One of the biggest impacts of ST-Edublog on my professional development is that I can seek in-depth knowledge about certain topic on ST-Edublog. If it is not there, someone can respond to my query quickly.* [Afnan] [focus group interview].

Sana offered similar views about the utility of ST-Edublog in increasing the knowledge and broadening the perspectives of student teachers:

*With this blog app, I can quickly elaborate on the particular topic, with correct references for statements made concerning that topic, with the aid of a secondary resource.* [Amal] [focus group interview].

From the above data, it can be argued that the perceived usefulness of ST-Edublog was because of the fact it was used for seeking and providing support to each other. Thus, it can be argued that this project might not only bring the student community together in Saudi Arabia but also increase their knowledge and professional development through positive and meaningful interactions. These propositions are supported by several other researchers (Goktas and Demirel, 2012; Rowe et al., 2012; Shih, 2013). Consequently, student teachers can reach a valid conclusion and, with the help of the blog, they could easily improve their limitations and weak points.

Students also learned about the generic features of ST-Edublogs without seeking any additional support, as outlined in the following reflective diary statement by Sana:

*I learnt to use the blog... to know about blog structure, as well as the privacy policies, rules on interacting with others on ST-Edublog, and rules concerning writing in the framework of a blog.* [Sana] [focus group interview].

Another respondent added the following opinion:

*I learn of subjective rules associated with the use of private internet data that are needed if comments are to be posted efficiently.* [Amal]

From the comments of Sana and Amal, it is obvious that the student teachers became aware of the rules and regulations applied by different blogs by interacting with others. Therefore, they learned about privacy rules, the structure of ST-Edublog, and the material posted on it. Similarly, Amal tried to obtain data about the rules concerning privacy of users when they are connected to a private internet connection. Blogging tools, like any other applications, are not without privacy threats from hackers. This is the predominant concern of users. ST-Edublog intends to provide a secure environment to student teachers, so that fear of attacks on privacy can be alleviated. Simultaneously, the structure was kept simple in order to facilitate easy and clear interaction, which was clear from the responses outlined in Table( 6-1).

### 6.7.2 Impact on skills development

Skills were also enhanced through the project. The participants were asked to show whether they agreed or disagreed with the following statement:*The online interactions supported by ST-Edublog help me to improve my teaching skills* .The overwhelming majority of the participants (N=15 -95 %) agreed to the statement, and five percent were undecided on the statement. The student teachers’ responses about the impact of ST-Edublog on the development of teaching skills had a collective mean agreement rating equal of 4.6 out of a possible score of five on the Likert-type scale, which was closer to strong agreement.

Writing skills were an advantage conferred by ST-Edublog on the student teachers. As one respondent said:

*I improved my writing skill, not much, but I can see a difference between the writing skills before and after the use of ST-Edublog*. [Sana] [focus group interview].

Other studies have revealed the benefits of blogs. Churchill (2009), whose study tracked 24 graduate students in the Faculty of Education in Hong Kong University over a single semester, concluded that using blogs helped to develop the writing skills and academic achievement of students, who enjoyed opinions and ideas when shared among peers. The study found that this facilitated education and encouraged participants to write their own blogs, thus improving their skills in using technology, as well as stimulating ideas.

A respondent pointed to the acquisition of creative skills through the use of ST-Edublog, which added to the usefulness of ST-Edublog for student teachers:

*I have learnt the various creative skills associated with good writing, read different comments on various topics and issues that happen on a daily basis through the use of ST-Edublog.* [Rana] [focus group interview].

Similarly, according to Nada:

*The ST-Edublog application has helped to increase my inventiveness when reading my classmates’ ideas on the app and using them to formulate my own ideas; it gave me the starting point I needed to achieve better ideas and increased my imagination* [Nada] [focus group interview].

Creativity and innovation were observed in Nada as a result of reading and developing the imagination by using the ST-Edublog application. Using the problem-solving strategies and concept evaluation strategies which were posted by peers on ST-Edublog for explaining complex issues to students helped student teachers like Nada to find more effective ways to address a particular challenging situation during training events. As Calfee (1986, pp1-2) stated, “Good teaching is good explanation”. ST-Edublog improved Nada’s concept evaluation and evaluation skills and provided her with an understanding of the relevant methods employed. This is supported by Brown and Atkins (2002), who argue that explanation, when related to teaching, is a way of enlightening others about a problem and making it comprehensible. According to Sally and Parker (2005), it is the communicative or linguistic aspect of an explanation that enables understanding, and this has been shown in Nada’s inability to use the method she saw on Instagram; there was no communicative interaction to facilitate her understanding of the problem.

Another respondent described the usefulness of ST-Edublog in terms of increasing communication skills:

*I always felt a hesitation when wanting to ask different types of questions to my teacher when I was attending college, but with Edublog I didn’t have the same feeling about communicating with peers to seek out an answer to something.* [Amal] [focus group interview].

This indicated that ST-Edublog helped student teachers to overcome their hesitations and communicate effectively with peers using ST-Edublog to find the solutions to their issues. This not only increased communication skills, but it also improved the teaching skills of student teachers. The qualitative data revealed that shyness and hesitations were the main barriers in the way of communication, and these were alleviated in the virtual communication environment supported by ST-Edublog. Several other studies have supported the role of blogging techniques in increasing students’ and teachers’ communication skills (Vurdien, 2013; Hsu et al., 2008; Kim, 2008). Communication skills play a key role in enhancing professional development, creativity and innovation of students through reading material, discussion of challenges and criticising ideas presented by peers (Gachago and Ivala, 2012). Overall, it can be argued that ST-Edublog is an appropriate platform to induce the professional development of student teachers through promoting communication skills.

The improvement of reflective skills was another benefit gained by student teachers through the use of the ST-Edublog project. Some respondents mentioned that their reflective practice was improved when they compared and contrasted their views with peers on ST-Edublog.

*ST-Edublog allowed me to think more deeply about my thoughts and views about teaching methods; reading articles on different issues in classroom gave a real push to my reflections about the teaching and class management practices*. [Amany] [focus group interview].

Hence, the use of ST-Edublog enhanced the reflective practice skills, especially when there was support from others online (Boulton, 2012). In order for reflective practice to be effective, student teachers need to be able to view their experiences from another perspective (Loughran, 2002), and the blog allowed others to discuss these experiences, and thus alternative views can be reflected upon. Collaborative learning allows student teachers to work together and construct meaning and knowledge (Clark, 2012). Such a collaboration has been described by Agyris and Schon (1978) as an approach where people become observers of themselves. Blogs enable collaboration and offer student teachers an opportunity to understand and be more creative with their own ideas; as Nada said, her colleague explained and Nada was able to reflect on how she could use that same technique and implement her own creative input.

Another study showed that student nurses found blogs useful for communicating their experiences and emotions, and solving problems with their peers (Chu et al., 2012). Zandi et al. (2014) showed that blogging helped a group of Iranian teachers to develop their professional skills by exchanging their views with peers, and sharing knowledge and training experiences within a community of practice. Based on these data, it can be argued that ST-Edublog has positive implications for promoting critical reflection among student teachers. Furthermore, these findings strongly support the use of ST-Edublog during training events for student teachers in Saudi Arabia. Further, Zandi et al. (2014) claimed that the position of blogs within a community of practice is critical in enhancing collaboration and sharing of knowledge, which in turn shape the professional development of student teachers. They showed that blogging carried a positive impact on improving the skills of teachers within a community of practice. Cakir et al. (2013) found that blogging was utilised by pre-service teacher education programmes for student teachers with techniques of engaging students and expansion of in-class discussion. Stoltenkamp (2012) suggested the installation of e-learning models comprising of social media instruments to increase the professional development of teachers in Kenya. This suggests that developing countries need to look for innovative solutions such as blogging to increase professional development, including teaching skills, during the training phase and for in-service teachers. The ST-Edublog can be a useful alternative to traditional methods for enhancing the classroom skills of student teachers in Saudi Arabia, which is addressed in the following section.

### 6.7.3 Impact on classroom teaching skills

In addition to general knowledge and skills, the ST-Edublog also helped students to enhance their teaching practice. As ST-Edublog enabled student teachers to differentiate between certain types of learning, some other studies have pointed to the benefit of blogging technologies in enhancing the teaching styles of students in various educational contexts (Davis and Waggett, 2006). Subsequently, student teachers can provide adequate information to their peers by utilising several kinds of comments, effortlessly adapting their teaching and learning practices to different kinds of learning activity (Shana and Abulibdeh, 2015; Blankson and Keengwe, 2010). These factors are critical for increasing the competencies of student teachers. In the early phase of the career development of student teachers, ST-Edublog can be a useful asset.

The quantitative data indicated that the project had had a positive impact on students’ practical knowledge of the classroom. The respondents in the study expressed their views about the role of ST-Edublog in increasing knowledge-sharing, development of teaching skills and concept development, as the data in relation to Survey Item No. PIOL1, PIOL2, and PIOL3 (Table 6.2) indicate. The participants were asked to indicate whether they agreed or disagreed with the following statement: *the ST-Edublog enabled me to share my training experiences with my peers*. The majority of participants agreed with the statement (N= 17 -85%), while one (5%) disagreed. The final two students (10%) remained ‘undecided’ about the statement. The student teachers’ responses regarding the impact of ST-Edublog on knowledge-sharing had a collective mean agreement rating equal to 4.3 out of a possible score of five on the Likert-type scale, which was closer to strong agreement.

In addition, the responses to the following statement – *The online interactions supported by ST-Edublog help me to improve my teaching skills* – were collected from the participants. The overwhelming majority of the participants (N=19 - 95%) agreed with the statement, and one (5%) was undecided on the statement. The student teachers’ responses about the impact of ST-Edublog on the development of teaching skills had a collective mean agreement rating equal of 4.6 out of a possible score of five on the Likert-type scale, which was closer to strong agreement.

These data suggested that student teachers strongly believed in the positive role of ST-Edublog in enabling them to share their training experiences with their peers, develop teaching skills and concept development through interactions with peers. The role of blogs in motivating students to discuss their academic tips, their experiences and stories about exams and courses is shown by several other studies (Yang et al., 2009; Chu et al., 2012; Zaidi et al, 2014). For example, Yang et al. (2009) showed that reflective blogs motivated student teachers in Taiwan to share their training experiences by exchanging group reflective dialogues, posting messages and comments about training experiences, and discussing pedagogical theories. The results indicate that ST-Edublog increased the sharing of student teachers’ experiences and feelings about practical training sessions. In addition, ST-Edublog helped them develop their educational performance through scientific and emotional support received on ST-Edublog from peers, which ultimately impacted positively on their teaching practices.

Many student teachers said that ST-Edublog played an important role in improving their teaching skills. For instance, one of the respondents expressed her feelings about the usefulness of ST-Edublog in improving pedagogical skills:

*With the help of ST-Edublog, I could quickly and efficiently improve my teaching skills as well as the relationships I had with my colleagues.* [Noah] [focus group interview].

Sarah expressed that ST-Edublog let her communicate with peers about pedagogical strategies which could be useful for generating new topics, enhancing the students’ interaction with and understanding of the given subjects.

*ST-Edublog allowed me to learn some strategies from peers about generating new topics, which really honed my teaching skills while also generating the relevant knowledge during my interactions with students.* [Sarah]. [focus group interview].

From the above data, it is clear that student teachers not only gained knowledge but also passed this knowledge onto their peers through discussions on ST-Edublog. Student teachers found that ST-Edublog helped them fill in the gaps in their knowledge and also prepared them for any awkward questions asked by students in the classroom. ST-Edublog, therefore, allowed them to have access to more information on how they can improve their teaching practices. It is important to student teachers that they should retain the respect of their students; it has been found in other studies that students’ perceptions of their teachers had a significant effect on their cognitive outcomes (Wubbels and Brekelmans, 2005). If students have a good relationship with their teacher, they are more likely to be motivated and receptive to learning.

Working as a team increased the responsibility of the student teachers and improved their practice throughout the training program. Wafa wrote in her reflective diary about what happened in her first training session:

*I joined ST-Edublog'... I read my friends' comments, and noted all the pieces of advice and education approaches and technologies and it was obvious that my performance was better than the first one. I don't know if it was because of their co-operation or because of my feeling that I wasn't the only one who was suffering.* [Wafa reflective dairy]

Wafa was making elementary mistakes in her teaching practice that may have been expected of any new student teachers. As with others in a similar situation, she put all the responsibility upon herself, blaming her change of plan for what she saw as the failure of her lesson. It became an obstacle and she perceived the lesson as being far worse than it was in reality. This caused her psychological stress and she was unable to sleep, worrying about her apparent failure. In turn, this preyed on her mind so much that she was dreading the thought of making similar mistakes on her second practice lesson.

In today’s world we try to achieve positive outcomes in any project, yet failure can be a positive outcome, as long as we learn from it (Loscalzo, 2014). Wafa was able to access this learning from ST-Edublog. She found that her mistake was not as bad as she originally thought, and she was then ready to take other advice before the next session. As she noted, she thought she knew best the first time, and would not have considered other people’s suggestions, but she learnt that sometimes this can help to avoid mistakes and thus progress.

It was clear that first teaching sessions do not always go to plan and the ST-Edublog application was good at helping student teachers to understand that they were not the only ones who had worried about their teaching practice. The student teachers shared the same fears and anxieties from the first training session, which was obvious in Rana's reflective diary:

*No single group of students achieved their goals, I couldn't control the session anymore,... I felt so frustrated... I shared that experience with my friends on ST-Edublog to find some solutions. In the discussion I discovered that I hadn't implemented the basic rules of working as a group.* [Rana reflective dairy]

Through discussion with peers on ST-Edublog, Rana was able to find some useful solutions which she did not implement during the training sessions. For example, she did not implement some basic rules of working within a group.

*I hadn't offered the right instructions for team-work, hadn't decided everyone’s role in the group... the most important thing that I should determine, the final aim you want the students to achieve... after overcoming these weaknesses my educational performance became better.* [Rana reflective dairy]

It is always difficult when working with new groups of students as the teacher has no experience of that group, as Rana found. In fact, Rana had overlooked one of the principles of teaching, which is to assess prior knowledge before embarking on a session. In a study relating to the prior experience of IT users, Taylor and Todd (1995) found that communicating information to inexperienced users influenced their behaviour, but only to the extent of how useful the IT system was perceived as being. Furthermore, Hailikari et al. (2007) revealed that previous study was the best indicator for success. This indicates that, as the students had no previous experience of studying online as groups, they were unlikely to succeed without clear instructions and information. Rana realised her mistake after the event, acknowledging that she had not clarified how relevant this group task was to the lesson’s aims. However, she did not realise all the fundamental mistakes in her teaching practice until she was involved in the Edublog discussions, which enabled her to reflect on what she had done and how she could improve.

There were more positive acknowledgements of the blog experience from participants in Halic et al.’s (2010) study with learners in an American higher education establishment. Participants felt their overall learning was enhanced, especially when they were able to reflect on their work outside the classroom; however, they did not value comments from their peers and their perception of learning was influenced by how connected they felt to their peers and their sense of belonging (Halic et al., 2010). Feeling part of a group may enhance a sense of being within a supportive environment, as other research has identified similar results (Lichtenstein, 2005; Sharma and Xie, 2008).

The communications on the ST-Edublog also increased the student teachers’ skill of managing students in their class experience by using group management. For example, Hada describes the way ST-Edublog helped her to manage students in the classroom:

*I think I lost my students’ respect when I sent a student to the headmaster. On ST-Edublog I found some similar situations; they advised me to approach the students, encouraging them and making variations between my teaching methodologies. These suggestions helped me.* [ Hada] [focus group interview].

Another respondent found ST-Edublog helped them access useful material to learn class management practices.

*I understand that I must read more and more and more on how to manage a class and I found great support from my colleagues who introduced me to a number of good books on this subject.* [Hind] [focus group interview].

These data suggested that student teachers gained support from their peers through using ST-Edublog to discover how to manage challenging situations in class. This gave them confidence to implement some of the ideas suggested on the blog to keep their classes under control. The tips shared by student teachers to manage the class effectively on ST-Edublog were highlighted by Scrivener (2012), who found such practices useful in creating an engaging learning environment. Doyle (1986) argued that keeping order in the classroom is essential and must be encouraged in order to establish positive learner-teacher engagement. All the activities that create relevant and engaging lessons help in the effective management of a classroom of students (Tan et al., 2003).

Sarah reflected in her reflective diary, and communication on ST-Edublog helped her eliminate hostile emotions among primary school pupils. She placed her conclusions in the reflective diary as below:

*I shared my story of controlling students’ negative behaviour in the classroom with my peers, which was liked by most of my peers. I felt so happy when I found some colleagues on Edublog asking about bad student behaviour and people telling them to use Sara's strategy, thinking that I'm its creator.* [Sara reflective dairy]

From the above comment it was clear that Sara’s story of managing students’ negative behaviour was not possible without the ST-Edublog app, which brought students and teachers close to each other for sharing their professional experiences. The real-time experiences of student teachers using ST-Edublog amongst themselves benefitted their professional skills and development of sound class-management practices. Blogs were found to be appropriate tools for fostering effective class management in the community of practice (Ray and Hocutt, 2006; Churchill, 2009). Many other studies have highlighted the importance of blogs in promoting robust and practical skills among teachers to help them manage classes after they were exposed to useful class management strategies on the blogging application (Yang, 2009, 2008; Ray and Coulter, 2008).

Further, the blog impacted on students’ abilities to plan lessons. According to Isoda (2007), using lesson study strategy is a common idea in Japan, where it is the most important professional development programme. Training practices in classrooms have been a great success, which was obvious in the co-operation between teachers. Lesson study strategy enables teachers to determine the challenges facing them while teaching, it also enables them to discuss problems, research for solutions, use their own experience to implement ideas, work as a team and exchange files and daily routines. Moreover, lesson study groups usually contain three to six teachers from the same field; however, they might be interdisciplinary teams. They begin by selecting a subject, title and an aim for the pupil’s learning. Teachers select a lesson of interest to them: usually one that is necessary in the field, one that poses problems for pupils, or one that is new to the curriculum. Ideally, a lesson study strategy addresses important academic learning goals (e.g., deep understanding specific subject and concepts) and broad aims to develop personal qualities and habits of mind (Cerbin and Kopp, 2006).

According to Fajar et al. (2017), lesson study comprises three steps – design, implementation and reflection – which are executed sequentially. The first step of the plan means designing and planning: that is, a stage in which the teacher and a group of teachers decide to collaborate to employ the lesson design that contains the material to be discussed in a course. The second step is implementation, where a model teacher performs a planned learning model in a class while the other teachers as observers watch the activities that occur during the course, especially what is done by pupils. The third step is reflection, which is a discussion group activity conducted after the class.

Student teachers were participating in this manner with each other through Edublog. New teaching methodologies appeared due to their interaction, as when they noticed that there was a mutual lesson between them, they started planning together for a unified plan. The student teachers' use of teaching strategy learnt from peers via ST-Edublog was simple but it was effective and fruitful. Quantitative data showed the positive impact of ST-Edublog on the student teachers' learning processes. It was obvious that student teachers were motivated to cooperate, whereas adults are very capable learners when they know well why they need to learn. They always learn when they find the motivator to do so (O'Brien, 2004).

These data indicate that the ST-Edublog was found to be an effective tool in developing the teaching skills of student teachers. Teaching skills constitute the core of the professional development portfolio, and teacher-training institutions are worried about finding the right tools to improve the teaching capabilities of teachers during their training, so that they make good teachers (Top et al., 2010; Keengwe et al., 2012). The ST-Edublog, like other blogs in different academic disciplines, was found to be useful, and it can be employed as an effective learning tool for student teachers.

Hramiak et al. (2009) found that application of blogs was an effective alternative to traditional methods based on reflective notebook-based diaries. They further reported that blogging was found helpful by student teachers through contributing significantly to professional development including gaining a clear understanding of the concepts delivered to them during the teacher training programmes. Yang et al. (2009) showed the positive impact of blogging on the development of critical thinking and learning complex concepts during student teacher training. Potter and Rockinson‐Szapkiw (2012) concluded that instructional technologies including blogs and social media platforms can serve as opportunities for the professional development of teachers.

Taken together, both quantitative data and qualitative data suggested that ST-Edublog mediated blogging is suggested as an important source for increasing knowledge-sharing, teaching skill, class management and concept development among student teachers, and it can replace the traditional paper-based diaries used for reflections and problem-solving. The significance of ST-Edublog for developing core concepts during training suggests the availability of a technologically supported avenue would improve the professional development of student teachers in Saudi Arabia. In addition, ST-Edublog is an effective application that enables student teachers to learn how to manage different problems according to their context and subject. In fact, there might be several issues related to new and innovative teaching skills which cannot be attained without recurrent interactions between student teachers and their peers. Similarly, there might be different types of students undergoing training to be teachers; during their training they learn different techniques for managing students effectively in the classroom. Thus, for any of the problems regarding class management and how to find a solution for them, ST-Edublog can come in handy.

## 6.9 Summary

In this chapter, I have outlined the student teachers’ responses to the blogging project. The findings indicate that blogs can be of value for initial teacher education, because they can enhance students’ learning in a range of ways. However, in order to have such value, the blogs should be aligned with the charactersitics of successful blogs, as identified in the literature. The ST-Edublog did feature these characteristics, and so the overall impact of its use was positive. Having considered the overall responses to the blogging project, in the next chapter I examine the impact on the self-determination of the teachers, focusing in greater detail on students’ sense of autonomy, competency and relatedness.

# CHAPTER SEVEN

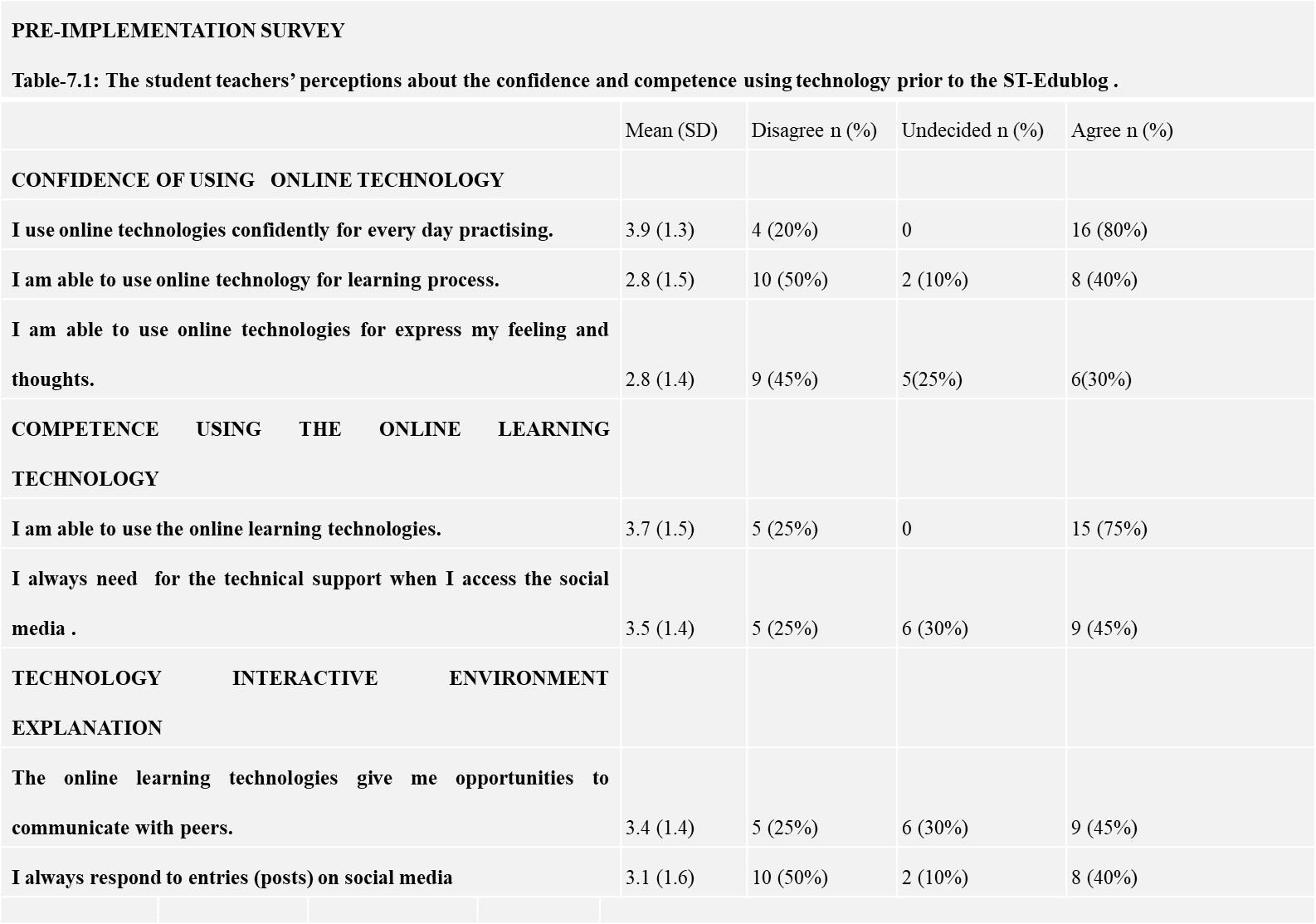
# IMPACT OF THE PROJECT ON STUDENTS’ SELF-DETERMINATION

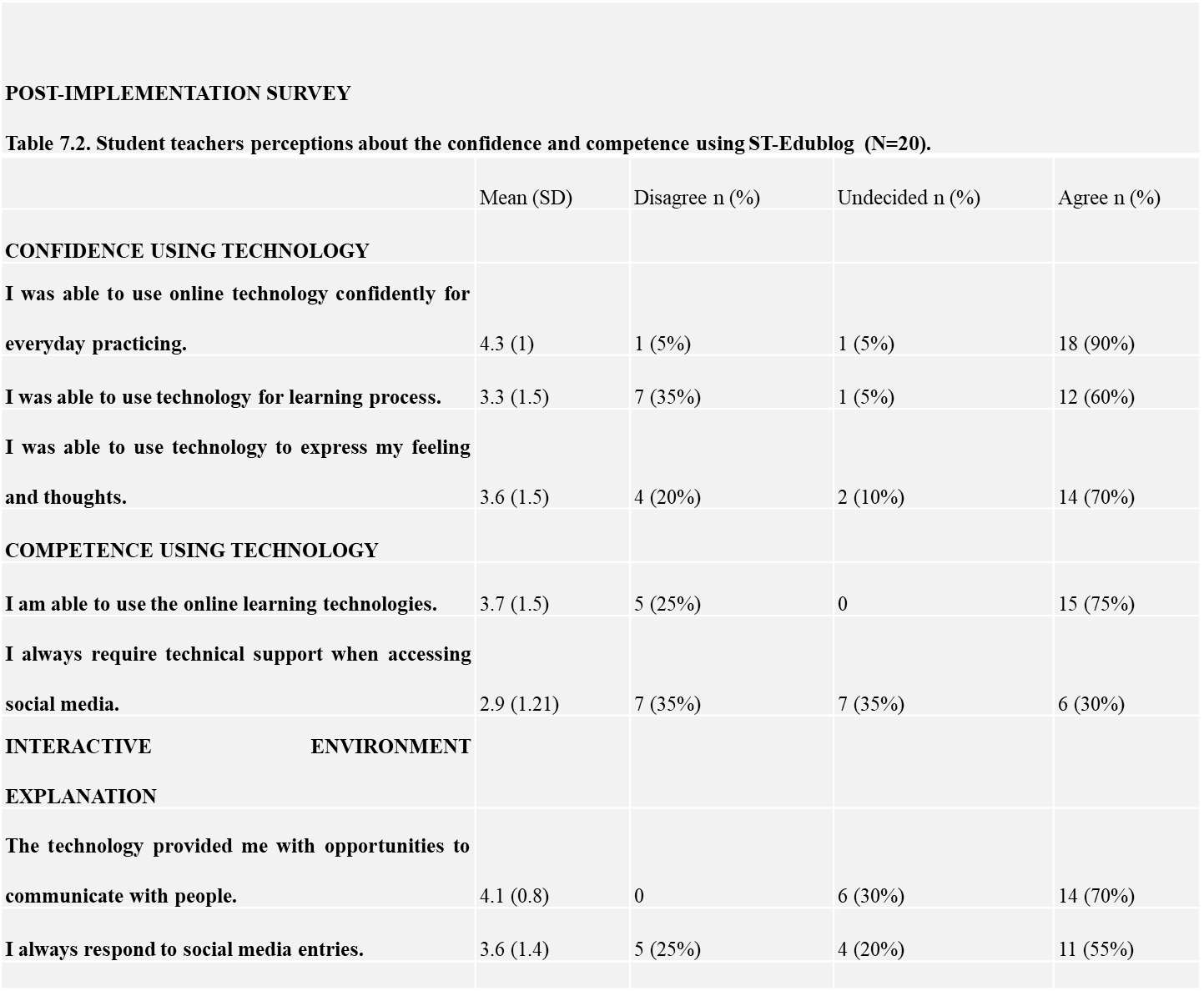
## 7.1 Introduction

In Chapter 3, the importance of self-determination for learning progress was outlined. Drawing on the theoretical SDT framework outline by Ryan and Deci (2000), it was determined that in order to enhance learning and self-confidence, it would be of value for the blogging project to have a positive impact on student teachers’ sense of their competence, autonomy, and sense of relatedness to others. In this chapter, these three aspects of SDT are explored in greater depth.

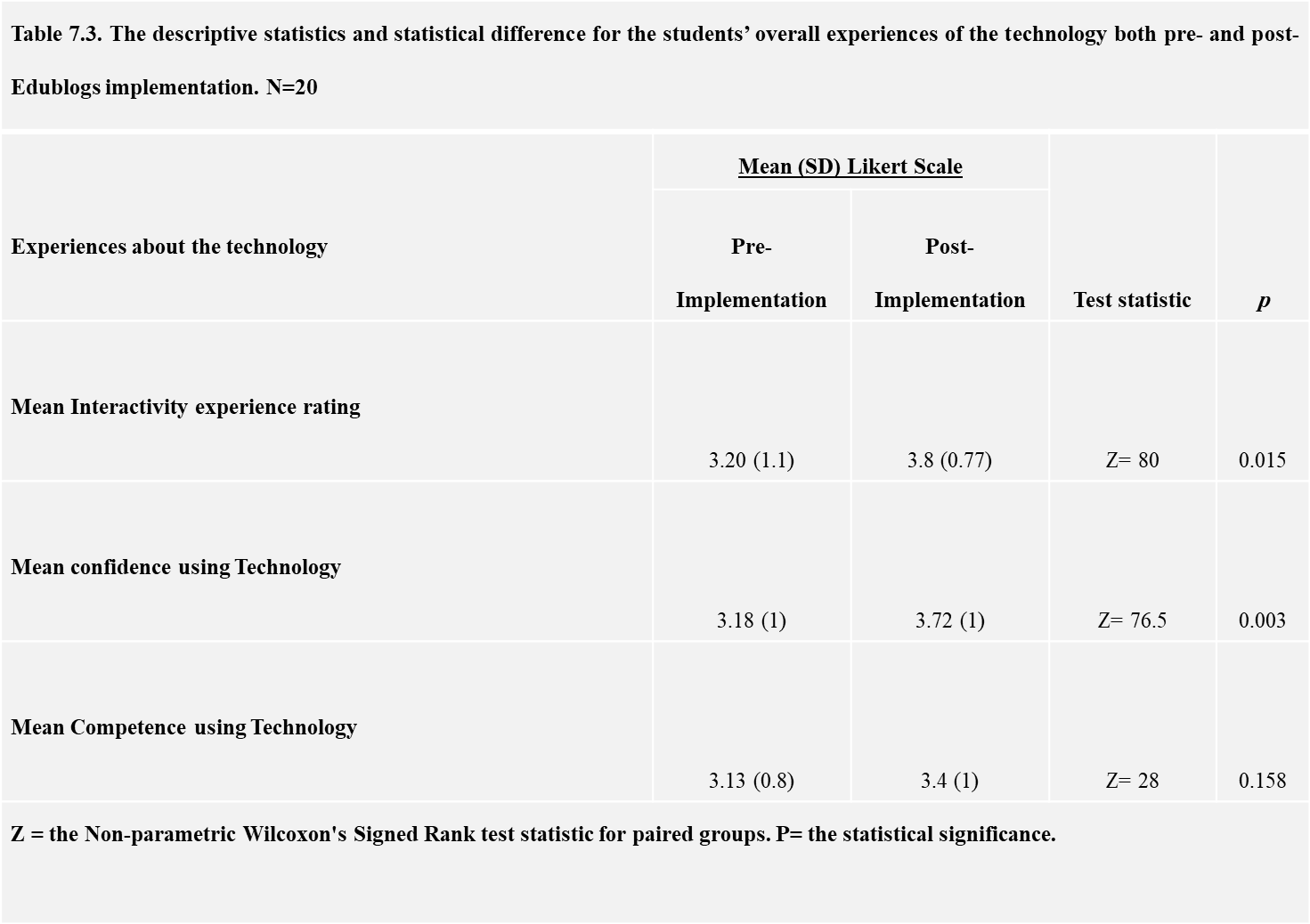
The outcomes of the first survey are outlined in Table 7.1. In this survey, participants were asked to respond using a five-point Likert-type scale that measured student teachers’ competence, confidence (related to a sense of autonomy), and perceptions of the interactive environment of the technology (related to a sense of relatedness). Table 7-1 shows those items comprising each of the three main concepts: the means, standard deviations, and the numbers and percentages of the individual endorsements made by student teachers according to their responses. For example, ‘I strongly agree’ and ‘I agree’ were collapsed together, as were ‘I disagree’ and ‘I strongly disagree’ in order to help the researcher identify the main patterns among student teachers’ agreement levels both before and after the Edublogs discussion group. All scores, values and mean values concerning participant questionnaires are given per this five-point Likert-type scale, with the highest possible score being 5.

On completion of the Edublogs project, I asked participants to respond to the same survey which is the the second survey in this study and the aim of this survey is to measure their baseline experiences; this allowed me to assess any changes in student teachers experiences when utilising the various social media applications and platforms (see Table 7.2).





These data were compared and contrasted, and the statistical significance of any difference outlined in (Table 7-3), in which the sub-categories under the themes of confidence, competence and interactive environment have been conflated to provide an overall level of significance in that category.



In the following sections, these data are compared and contrasted. In addition, I draw on

the rich dataset constructed through the focus group interviews in order to examine the students’ responses to the project. To begin with, I examine the impact of the project on students’ sense of autonomy.

## 7.2 The impact of the project on students’ confidence and sense of autonomy

According to Ryan and Deci (2000), in order to feel autonomous, inidividuals need self-confidence. If people feel confident, then they are more likely to feel that they can achieve something as a result of their own efforts. The confidence of participants in ST-Edublog was measured using three parameters: the use of online technologies in their daily activities, the use of technology for learning purposes, and the use of technology for their expression of thoughts.

Prior to the study, the participants of the study were asked to agree or disagree with the following statement: *I use the online technologies confidently for every day practising*. The majority, 16 (80%) of the participants indicated their ability to use the online learning technologies in their daily practice, while four (20%) of the student teachers felt that they were unable to apply the online technologies to their daily practices (Table 7.1). Based on the collective mean, this factor is rated equal to 3.9 out of 5 on the Likert scale, showing the majority of the student teachers suggested that they applied online learning technologies to their daily practices.

The daily practices might include contacting friends, colleagues, supervisors and relatives or doing shopping via the use of online technologies. These technologies might include mobiles, tablets, and social media platforms, and mobile apps. Most of the student teachers showed their confidence in the online learning tools to satisfy their daily communication needs, suggesting a favourable attitude among the participants towards selecting the online technologies for performing their daily activities. However, it does not necessarily mean that they had trust in using the online technologies for improving their learning and skills development.

This finding is in line with the conclusions drawn by several scholars (Eid, 20011; Agarwal and Wu, 2015; Al-Gahtani, 2011) that people in the emerging digital market show more trust and confidence in digital or online technologies compared to people in the mature digital markets such as Japan, the UK, North Korea and Japan. Al-Khouri (2012) and Al-Gahtani (2011) explained that this was due to the fact that users in the emerging markets have less experience in using different online tools in order to fulfil their daily needs or they have fewer online technological options to execute their daily practices. This situation results in the trusting behaviour among users of technologies in the developing countries such as Saudi Arabia, which are classed as an ‘emerging digital market’. Other reports also provide evidence that resonate with the findings of this study, showing that acceptance and confidence in using the online technologies are higher among educated people compared to people with low education backgrounds (Al-Harbi, 2011; Alebaikan and Toudi, 2010; Eid, 2011). This argument might be extended to the student teachers in this study, who were highly educated with knowledge of the use and the advantages attached to the online technologies in their daily practices. Therefore, the fact that the student teachers showed a high level of confidence in using the online technologies is in line with previous research.

On completion of the intervention,participant responses concerning their perceived confidence in using technology concerned for daily pragmatic use varied between ’agree’ and ’strongly agree’; it is clear that the majority of participants (N = 18, 90%) agreed with the statements presented to them, while a few (one in each category, 5% each) were either uncertain or else responded that they ’disagreed’ with the statement. This led to a rating of 4.3 points out of a possible 5 (Table 7-2). Therefore, participants’ self-reported mean confidence when using technology for daily educational activities increased after the Edublogs project had been implemented from 3.9 to 4.3 out of a possible 5 points.

Prior to the study, participants’ levels of confidence in the use of technology in general was higher than their levels of confidence in the use of technology for learning. When asked about their utilisation of technology for daily learning the results showed that 8 (40%) were confident in using technology for such purposes before the Edublogs project’s implementation. This may be attributable to their poor experience in this regard, as in general universities in Saudi Arabia do not provide proper support in this area for student teachers before they commence their work in schools (Algahtani, 2011). There was an increase after the intervention, in that 12 (60%) students said that were confident in utilising technology for learning, The participants’ collective rating of their confidence in using technology for learning purposes after the ST-Edublog intervention was shown to have a collective mean of 3.3; hence, participants’ responses fell between ‘unsure’ and ‘agree’ categories. Therefore, whilst this area was impacted positively by the project, it was not as large an impact as students’ general use. This may be because the use of technology for learning purposes is more challenging that its use for everyday tasks, and therefore achieving a change in levels of confidence may need more extended projects in which participants can build confidence over a long period of time.

The third area in which students’ levels of confidence were explored was in relation to the expression of emotions and feelings. The majority of participants stated their capacity to utilise technology for such ends prior to the implementation of the ST-Edublogs project was non-existent (Table 7.1). The percentage of student teachers that found technology useful increased after the project’s implementation; this is potentially attributable to their engagement with the platform and its capacity to help them present their feelings and thoughts concerning their field training.

Prior to the study, most of the students felt that they were not confident in using technology to express their opinions and feelings. Nine (45%) were not confident, 5 (25%) were indecided, whilst 6 (30%) did state that they were able to do this. Following the implementation of the ST-Edublog intervention, the majority of participants (N = 14, 70%) stated that online learning technologies were a useful means of sharing feelings and thoughts, while 4 (20%) of participants disagreed with the use of online learning technologies for sharing their experiences. A small percentage of the participants (N = 2, 10%) were ‘unsure’ of the use of online learning technologies as a means of sharing their experiences. The participants’ collective rating of their confidence in using technology for sharing their feeling and thoughts after the ST-Edublog intervention was shown to have a collective mean of 3.6, thereby suggesting responses closer to agreement on the 5-point Likert scale.

Taken altogether, participants’ self-reported mean confidence when using technology for daily educational activities across these three sub-categories increased after the ST-Edublogs project had been implemented; the self-reported score increased from 3.18 to 3.72 out of a possible 5 points. This highlights that participants’ overall confidence in utilising technology for educational use, daily use, and for independent socialising increased; furthermore, the Wilcoxon’s signed test rank indicated this rise in confidence using technology was statistically significant (p=0.003) (Table 7.3).

Confidence is a psychological trait that belongs to the personality and attributes of the users, referring to the belief of a person that they have the ability to perform certain tasks with clarity and perfection. The increase in the confidence level of the student teachers in the use of ST-Edublog for expression of their opinions and daily activities is indicative of the belief of student teachers in their capabilities to perform different tasks effectively. The use of ST-Edublog over an eight-month period might be a contributory factor in enabling the student teachers to become familiar with the different functionalities of ST-Edublog, which might have resulted in a rise in their abilities to perform communication effectively with their peers. Verkasalo et al. (2010) posit that an extended use of online technological applications leads to the better usage of such applications due to the increased confidence level of users.

The confidence in the abilities of the bloggers is also related to their ability to become engaged with the development of deeply personalised content. The appreciation of creative activities on behalf of other bloggers also gives a boost to the confidence of creative and active users on the blogging platform (Pallot and Pawar, 2012). This explanation can be extended to the confidence level of the student teachers. The creative activities performed by the student teacher might have won the recognition and applause of their peers, which might have caused a rise in the confidence level of the participants. This also indicated that ST-Edublog has the potential to induce the user to express themselves, which guarantees the promotion of the positive learning atmosphere on the platform (Chen et al., 2015). Some studies have supported this proposition by showing that creative discussion and problem-solving in an innovative way raises the social image of the bloggers, which forms the basis of increased confidence in their own abilities to perform different tasks in order to solve the problems of others and seek the solution to ones’ own problems (Balakrishnan and Gan, 2016; Hafiz Zakaria et al., 2010).

In the case of ST-Edublog, every student teacher had an equal opportunity to publish and express her own thoughts. This process contributed to an increase in understanding of the knowledge shared on the platform, the construction and interpretation of ideas and the concept of mutual benefit. These factors might have contributed to the enhanced confidence of student teachers in their abilities to exchange information and experiences confidently.

Emerging web-based technologies have affected the whole educational process and learning environment. To gather more information about the role of ST-Edublog in increasing confidence after their exposure to the ST-Edublog, participants were asked to complete a reflective diary in order to provide more details. Hada explains how she was able to interact directly with her peers regarding educational purposes and matters on the ST-Edublog platform. She noted:

*Before the use of ST-Edublog, I was afraid to communicate with the supervisor... but ST-Edublog helped me to gain my confidence back through virtual interactions with peers,... I can ask any questions to my peers, and they can give their comments anytime.* [Hada] [focus group interview].

The following views, similar to Hada’s, were expressed by Rana after using ST-Edublog:

*I felt shy in front of the crowd of students during the last semester in the classroom. But, after adopting ST-Edublog, I became more confident and reduced my shyness. And I interacted with others in an easy and flexible way and without hesitation.* [Rana] [focus group interview].

It can be concluded from the aforementioned data that student teacher anxiety levels are reduced through utilisation of ST-Edublog, which in return promotes the positive learning environment, interactivity and collaboration among student teachers. Educational materials and information are also more readily shared among student teachers, due to the removal of temporal and spatial restrictions.

It is possible that some of these student teachers feel protected due to face-to-face interactions with their peers. However, using ST-Edublog, they could ask any question about a concept that everyone else appears to understand and still feel safe an online facade. Lee et al. (2019) produced similar findings, showing that online engagement of Korean university students with their peers increased the level of interactions and confidence in the e-learning environment.

Student teachers were more encouraged to interact with each other without hesitation when using the blogging technique. Jawahir also noted:

*The ST-Edublog project has made my conversations with my peers more comfortable. I can exchange my expressions and opinions without hesitation through the ST-Edublog app.* [Jawahir] [focus group interview].

In a similar way, the ST-Edublog environment enabled those who were too shy to ask questions, as Hada explains. She felt too embarrassed to ask questions in a classroom, yet she could happily interact with online participants:

*ST-Edublog helped me to interact; it helped me to comment and share my views without feeling embarrassed. I find it to be an excellent feature as it allowed me to overcome my shyness.* [Hada] [focus group interview].

Hence ST-Edublog was useful in increasing engagement through overcoming socio-psychological barriers in the way of communication among student teachers. According to some (Philip and Nicholls, 2009; Wang, 2009), blogging techniques and interaction with others through ST-Edublog have helped to overcome sociological and psychological issues among student teachers (Byington, 2011), thereby boosting the confidence level of participants in the virtual environment.

A lack of confidence can deter students from asking questions in class, as they do not want to be seen as foolish in front of their classmates. This may result in them never understanding a simple concept and that may have an impact on their future learning (Sun and Chang, 2011). Chin and Osborne (2007) found a relationship between the quality of student questions and conceptual understanding as well as achievement. Furthermore, students that worked in groups were more likely to produce more insightful questions (Marbach-Ad and Sokolove, 2000), and this adds more support for finding ways where students can more readily work with their peer groups.

These data indicate that the project had a positive impact on students’ levels of self-confidence which, according to Ryan and Deci (2000), leads to a greater sense of autonomy. In the next section, I move on to consider the impact of the project on students’ feelings of competence.

## 7.3 The impact of the project on students’ feelings of competence

Feelings of overall competence that lead to enhanced self-determination may also be impacted by using online technologies in a supported environment such as the blogging project. This area was assessed via two factors: competence in the use of online technologies, and the support required to execute tasks using the online learning technologies. Prior to the implementation, the student teachers’ general agreement with the statement “I am able to use the technology” was rated as 3.7 points out of a possible score of five; a majority (N15 = 75%) agreed that they were able to use technology, while a few of them (N5=25%) disagreed. However, the students did need help when using the technologies. The responses to the statement, “I always need technical support when I access social media, were rated 3.5 out of a possible score of five, indicating that collectively their responses were between uncertainty and agreement (Table 7.1). Most (N9= 45%) in fact agreed that, generally they did require technical support, while a reasonable percentage (N6=30%) were uncertain regarding their need for help; still fewer (N5=25%) disagreed with the statement, denoting that they did not need support when using technology. Following the intervention, in relation to the question about the ability to use the technology, the majority of participants (15 – 75%) ticked the options ‘agree’ or ‘strongly agree’, while just a quarter (N = 5, 25%) responded by ticking the option ‘disagree’. Participants’ self-reported competence in utilising technology was collectively rated with a mean agreement of 3.7 out of a possible 5 on the Likert scale (Table 7.2). Therefore, there was no difference in levels of competence prior to and following the intervention. However, fewer (N6=30%) indicated that they required technical support, with seven (35%) undecided and seven (35%) requiring support. The participants’ need for technical support regarding technology use after implementation of the Edublogs platform was given a rating of 2.9 out of a possible score of 5 on the Likert scale. Consequently, the results of the Wilcoxon’s signed test suggest that the difference between pre-COP and post-COP perceived competence was not statistically significant (p=0.158) (Table 7.3).

The non-significant change in the competence level can be attributed to the already sufficient level of the competence possessed by the student teachers in using the social media platforms for communication purposes before the implementation of ST-Edublog. This was evident from the data shared in Chapter 5, when student teachers stated that they had the competence to browse the blogs, read posts and send messages. Many studies have shown that students have sufficient knowledge and competence in using social media platforms to communicate with their peers, thereby suggesting the presence of a considerable level of expertise in the use of social media, including blogging technology (Alusaihi et al., 2016; Alwagait et al., 2015; Alfawareh and Jusoh, 2014).

Whilst the quantitative data did not indicate any significant changes in relation to feelings of competence, there were some changes. This was corroborated in the qualitative data. For example, Jawahir noted:

*It* *is clear that this newly adopted educational technique has been increasing interactivity among me and the other student teachers, and it has also reduced my hesitation due to the technological orientations. So, I hope that soon the college will adopt this blogging system as an educational process and tool to increase the productivity of my educational approach.* [Jawahir] [focus group interview].

In the final section of this chapter, I move on to consider the third element of SDT, relatedness.

## 7.4 The impact of the project on students’ feelings of relatedness

The students’ thoughts on the interactive environment created by the blog, which may impact on a sense of relatedness, was measured by assessing the participants’ views on the communications with peers using the online learning technologies, and their participation in activities on the online learning platforms.

Participants evaluated whether technology provided them with the opportunity to liaise and communicate with their peers. Prior to the project, only nine students (45%) felt that to be the case (Table 7.1), whilst following the implementation of the project, the majority of participants (N = 14, 70%) were of the view they were able to grasp the opportunity of communicating with their peers using the online learning technologies (Table 7.2), whilst none stated that they disagreed with this statement (5 students disagreed with the statement prior to the intervention). 6 (30%) participants remained undecided as to the improvement in communicating with peers using the online learning technologies following the project, the same number as prior to the project. The participants’ responses were collectively rated as having a value of 4.1 points of a possible score of 5 on the Likert scale. The Wilcoxon signed rank test results indicated that there was a statistically significant increase in perceived interactivity responses from participants after implementation of the Edublogs project (p=0.015) (Table 7.3). Therefore, it can be concluded that the implementation of ST-Edublog helped the participants to communicate with peers effectively using the online learning technologies.

When the participants were asked about their willingness to respond and follow up social media on the online learning platforms, the majority of participants (N = 11, 55%) showed their agreement with the statement (8 prior to the intervention), while only 4 (20%) participants were unsure about the statement (2 prior to the intervention). The remaining five (N = 5, 25%) participants showed that they disagreed with this (11 prior to the project). Based on the mean of responses, the statement was rated as 3.6 of a possible score of 5 on the Likert scale (Table 7-2). Based on these data it can be argued that implementation of ST-Edublog showed a positive impact on the participation of the majority of the participants who became effectively engaged with the online posts.

Overall, participants’ mean interactivity scores increased from 3.2 to 3.8 out of a possible 5 points after the implementation of the Edublogs project, which highlights participants’ general inclination to agree with the statements posed to them regarding the interactive nature of the technology and its capacity to facilitate more sociable communication online. Table 7.3 indicates that student teachers showed significantly higher interaction levels with peers after implementation of ST-Edublog. The higher the frequency of interactions of student teachers with each other, the better the opportunity for knowledge-sharing and skills development through the exchange of experiences and knowledge via ST-Edublog. The blog allowed the student teachers to post different materials, which were viewed by other student teachers; this was the form of user-content interaction, and user-learner-learner interaction. As this project did not include the instructors of student teachers, there was no learner-instructor interaction involved during the implementation of the ST-Edublog project. Therefore, it can be argued that the rise in the interactivity level might be attributed to the two aforementioned forms of interactions.

Previous studies have supported these findings, showing that blogging technology plays a significant role in learning and professional development by promoting the interactive learning environment. Robertson (2011) argued that three types of interactions can occur on the blogging platforms, including the learner-learner interaction, learner-instructor interaction, and learner-content interaction. Collectively, these forms of interactions are considered to be fundamental to enhancing the effective learning experiences, promotion of knowledge and professional development of experienced teachers and student teachers. Dabbag and Kitsantas (2012) posited that a collaborative learning experience is the outcome of all three aforementioned types of interactive environment provided by the blogging technology used in the community of practice.

Many studies have referred to the interaction of students with other learners in the collaborative space of online learning technologies as the ‘social presence’, which was positively correlated with the student satisfaction with learning outcomes (Pepeler and Solomou, 2011; Lowenthal, 2010). The authors define the social presence as a phenomenon which allows the learners to interact closely with each other for learning purposes. The continuous and constant engagements of learners lead to the establishment of a creative learning environment which serves as a motivating force for learners to generate learning communities within a community of practice (Rambe, 2012).

ST-Edublog provided the student teachers with an opportunity to become connected to each other, thereby resulting in social interaction and, subsequently, the development of a learning environment. Sidek and Yunus (2012) reported that the social interactive space provided by the blogs for students increases the sense of connection among them, which promotes the effective learning environment. Furthermore, this indicates that ST-Edublog provided a rich learning environment for student teachers to enhance their skills and knowledge.

Many studies have highlighted the importance of the educational blogs for increasing knowledge, for the academic achievements and the skills development of learners through the active interaction and exchange of learning resources with each other (Popescu, 2010; Wu and Wu, 2011). The interactive environment of blogs enabled the learners to communicate with each other and manage the learning resources effectively within a community of practice (Infinedo, 2017). Some other studies have reported the use of blogs offering an opportunity to learners to share the assignment links, course updates, other useful links, and management of syllabi (Yunus et al., 2012; Avci and Askar, 2012). Hence, it can be argued that ST-Edublog can be a useful online resource which can be utilised through continuous postings from learners and instructors for guidance and knowledge-building among the student teachers in Saudi Arabia.

Through the implementation of the ST-Edublog project, sharing of both comments and feedback increased; furthermore, student teachers’ convictions and feelings of certainty were improved. Huang et al. (2009) argued that collaboration comes from the positive interactions of users with each other in an e-learning environment and encouragement to participate in challenging discussions. Blogging platforms are the useful tools for promoting intellectual debates, which not only prepare students and teachers to deal with uncertain situations but also allows them to play a leading role in their professions (McLoughlin and Lee, 2010; Jones and Lea, 2008).

The collaboration that blogs provide can bring together communities that may find other forms of interaction more challenging. This may be because of geographic locations or time constraints, but blogs can mean that participants engage in a collaborative process that engages both reader and blogger (Baumer et al., 2011). Such participation in a blog does not require readers to be actively involved in commenting; they can still sense the interactive activity going on around them and feel part of that community (Baumer et al., 2011).

In addition, the sociological effects on the emotional state of student teachers using ST-Edublog were positive. Van Kleef (2017) presented a theoretical framework that focused on the interaction between emotions and social communications; for example, the emotional state of a person is likely to draw an empathic response from others. As indicated in the data, students were able to interact more sympathetically with each other, and overall it can be seen that feelings of relatedness were enhanced as a result of the project.

### 7.4.1 Relatedness through development of communities of practice

The concept of communities of practice was developed to explain informal learning that takes place in social settings and Wenger et al. (2002) affirmed that the term community of practice is not a new concept as its origins are based on social learning theories. These theories emanate from Bandura (1977), Vygotsky (1978) and Lave (1988) and focus on the importance of social interaction and/or the social conditions of the learning process, which mean that learning requires a social environment and thus acquires its meaning and value. Researchers have proved that behavioural and social patterns are acquired by imitation and learning by observation (Gazda, 1980); thus the student teachers' results can be explained by Bandura’s (1977) social learning theory. The quantitative results explain that student teachers' confidence in using technology in their daily lives has increased, and this technology has helped them increase their trust in using it to learn and has helped them to express their feelings and thoughts. The quantitative results matched the qualitative results.

Bandura’s theory explained that learning is achieved by following other colleagues and from the support and encouragement that students receive (Bandura, 1977). Bandura confirms that students' comparison of their performance with others' performances and their observation of successful models helps them in learning and in knowing their own competence (Bandura, 1982). It is clear that Edublog has strengthened social connections between trainee students and this concurs with studies by Carley et al. (2018) and Stoszkowskij et al. (2017). What is mentioned above is evidence of the importance of social interaction in developing informal learning; although the field training is over a long period, I noticed intervals between student teachers entering ST-Edublog, so I sent emails to some of them to reassure them and motivate them to discuss what they were thinking about. This was a motivation for some of the student teachers to use ST-Edublog for beneficial interactions with peers.

The interactions with peers on ST-Edublog under supervision can better help achieving learning outcomes through ST-Edublog intervention. For example, Vygotsky (1978, p. 67) points out that the teacher plays the role of mediator and can change the learner's knowledge from being general and public to becoming more specific and specialised, and gradually guides him to understand and master the task. This is key to motivating students to understand scientific knowledge, as Vygotsky states that there is a need for the mediation of teachers to teach their students and make them think.

On the other hand, there is also the theory of situated learning (Lave, 1988), which has expanded the concept of social learning by focusing on the idea that learning is a result of activity, according to culture and interactions of individuals, meaning that knowledge and learning are all about relationships. These relationships are between mutual individuals involving some activity and the tools and media they use and the conditions of the environment where the activity takes place (Bereiter, 2002, p. 59).

Lave’s theory suggests that knowledge is not related to any formal concept but is a result of interactive activity between individuals and the situation that has caused it, so knowledge develops with the change of situation, because new situations, discussions, and activities will lead to a new shape for this knowledge. These practical situations link with the activity and the environment that developed them and then they spread to other parts (Giacoppo, 2007).

With the popularity of using social networks for transmitting information and the incorporation of both social and instructional communication techniques in social practice via the web, what is known as teaching by communities of practice has appeared; these have specific qualities explained by Brady et al. (2010), including social flexibility, which means the end of the original concept of a reference group, as this new community is not determined by geographic location but by meetings of a group of learners through electronic interaction. In this study there are student teachers living in the suburbs, which consist of many small villages overseen by a chief governorate, where the university headquarters are situated.

## 7.5 Summary

In this chapter, I have considered the impact of the chapter on students’ feelings of confidence (related to autonomy), their competence and their sense of relatedness. Whilst the statistical findings in relation to competence did not indicate major shifts, there were some changes, as the focus group discussions indicated. Of more significance was the impact of the project on students’ levels of confidence, which impacts on autonomy, and their sense of relatedness to others. These findings indicate that the students’ overall level of self-determination was enhanced as a result of being engaged in the project. In the conclusion, I will return to the research questions and reflect on how far the study addressed these. I will also consider the implications of the study for further research, policy and practice.

# CHAPTER EIGHT

# CONCLUSIONS AND RESEARCH IMPLICATIONS

## 8.1 Introduction

The purpose of the current study was to investigate the potential value of implementing blogging technology as a learning tool in order to improve the overall learning experience of student teachers in Saudi Arabia. In previous chapters, the results and discussion were presented; this chapter summarises the findings. I begin by returning to the research questions that underpinned the study. I then relate the findings to the theoretical framework, before outlining the limitations of the study. The chapter then moves on to outlining the implications of the study for future research, practice. Finally, I close the thesis with reflections on the contributions of the study to the field.

## 8.2 Addressing the research questions

The overarching research question of this study was, “How successful is the use of blogging technology as a tool for developing the learning, skills and self-determination of student teachers in Saudi Arabia?” The outcomes of this research highlight the potential significance and increasing role of social computing applications such as educational blogs in developing the knowledge and skills of student teachers during their training phase at universities. ST-Edublog was designed based on an understanding of the motivational affordances of learning technologies for increasing professional development of student teachers, and it was found that knowledge and skills were significantly improved among student teachers from the selected Saudi university as a result of the implementation of ST-Edublog in this study.

The study had four research sub-questions, which together enabled me to explore the main research question. The first of these was: ‘What perceptions do a group of Saudi student teachers have of blogging technology in comparison to other social computing applications (e.g. Facebook, Twitter, Snapchat)?’ The student teachers were found to hold a positive opinion about the technological affordances of the educational blogs in terms of solving academic issues, searching for information on specific topics of interests, and communicating with peers for updates in pedagogical practices. Many other social media applications (Facebook, WhatsApp, Twitter, and Snapchat) discussed in this study were found to be used only for communication of general everyday issues such as family, political and social problems, rather than intellectual discussions.

This finding suggests that the student teachers in this study were more motivated to use educational blogs to improve their learning and skills than compared to other social media applications such as Facebook, WhatsApp, Twitter, and Snapchat. This is in line with the findings of previous research showing the increasing potential and acceptance of blogging tools for gathering knowledge and development of professional skills (Churchill, 2009; Hemmi et al., 2009; Robertson, 2011). The positive cognitive and psychological orientation of the Saudi student teachers (such as the aptitude to accept digital technology as the media for learning and skills/knowledge) to use the online technologies also paves the way for designing and implementing tools like ST-Edublogs, which will motivate them to learn and develop knowledge in a pleasant and accessible learning environment.

The literature review identified a number of blog features that were effective in supporting learning, which were then built in to the ST-Edublog. The second research sub-question was; ‘How did Saudi students teachers perceive the ease of use, usefulness, compatibility, enjoyability and interactive elements of the blog used in the Edublog project?’ The alignment of blog features, such as archiving, multimedia components, and blogging, with the needs of student teachers significantly improved their learning satisfaction. These data indicated that careful planning at the design stage of the educational blogging tools is required to make them effective learning tools for students. This also requires student teachers to report learning needs accurately to their educational departments, and the educational institutions need to consider the integration of essential features as described above into the design of educational blogs. These measures can help student teachers and educational institutions to achieve the benefits of educational blogging for students.

The perceived usefulness and ease of use of educational blogs produced a significant impact on student teacher learning satisfaction, as revealed in this study. Both dimensions – ease of use and usefulness – showed a significant impact on student teacher learning satisfaction. The ease of use dimension was improved by increasing the ease of accessibility and clarity of interactions, while usefulness was measured through the effectiveness of online learning communication patterns with peers . These data show that communication and interactions of student teachers are critically important for enhancing the effectiveness of ST-Edublog as a learning tool. Therefore, all projects dealing with integration of educational blogs into the learning environment should monitor the communication patterns, produce examples and prototypes in order to create clarity in its interactions through creating separate categories of issues faced by student teachers, such as a class management section, and confidence and competencies sections, and increasing the accessibility to the available information through archiving present and past communications.

The third research sub-question was: ‘What impact did the blog have on student teachers’ development of skills and knowledge?’ The findings revealed that ST-Edublog created a more pleasant learning experience among student teachers, which significantly increased their learning satisfaction. This suggests that ST-Edublog can be an effective learning platform for creating fun and enjoyable activities, which can promote the engagement of users with the blog’s learning content. This outcome is also critical to informing educational blog developers and educational institutions to foster learning through the provision of a pleasant learning environment. The findings of this study showed that ST-Edublog increased the learning process through improving knowledge-sharing, teaching skills and development of conceptual knowledge through enabling interactions between student teachers. The significant relationship between learning outcomes mediated by ST-Edublog and learning satisfaction was reported by this study, thereby suggesting the potential of ST-Edublog and other similar blogging technologies for improving the learning outcomes such as knowledge acquisition and professional development of student teachers.

## 8.3 Self-Determination Theory

This thesis drew on SDT in order to understand the data and identify how far it developed students’ learning and development. Therefore, the fourth and final research sub-question was: ‘What impact did the blog have on the three key elements of self-determination – autonomy, competence and relatedness - of student teachers?’ Self-determination theory provided the framework for this study. It is associated with motivation and how both intrinsic and extrinsic motivations shape the way we behave (Deci and Ryan, 2008). Furthermore, self-determination reflects whether motivations are self-directed or whether there is some social pressure to behave in a particular way. Theories provide more understanding of a phenomenon and can be used in this case to develop further understanding of behaviours. As Patrick and Williams (2012) concur, self-determination theory is especially useful as it defines motivation as being directed towards a specific goal.

### 8.3.1 Autonomy

With respect to autonomy Ryan and Deci (2000) suggest that an individual must take responsibility for his or her own decisions; they must believe they have the confidence to achieve their goals, and they need to feel that others approve and support them (Patrick and Williams, 2012). There is an assumption that people have a basic psychological need to feel they are competent, autonomous and that they have a sense of belonging, and that these needs will encourage them to become motivated to achieve (Schneider and Kwan, 2013). The general sense of wellbeing that emanates from these needs being met will impel people to continue.

Intrinsic motivation is, according to the theory, natural to every individual but needs to be stimulated and this depends on the social and environmental factors surrounding an individual (Riley, 2016). In terms of learning or education, an individual learns because they want to learn and gain more knowledge. Ryan and Deci (2000) suggest that this leads to an immense feeling of inner satisfaction and fulfilment. However, before learners can enhance this inner motivation, they need the confidence to take on responsibility for their own learning.

Autonomy is a vital tool for teachers and learners in education which enhances independence, confidence, and intrinsic motivation as individuals engage in various concepts. According to Prenaflorida (2002), autonomy can be defined as independent learning where individuals set personal goals according to their needs for effective learning in a specified period. Autonomous learning includes several aspects such as self-direction; in regard to the data collected from the student teachers, it is clear that the teachers were able to identify and solve classroom problems by discussing these with other student teachers through ST-Edublog. This indicated that these student teachers had self-direction. There are many reasons why the student teachers showed self-direction and one of them is intrinsic motivation, which is defined by Ryan (2009) as an internal drive dependent on external results or circumstances. The fact that the student teachers desired to be competent meant that they were intrinsically motivated.

The results indicated that the student teachers were concerned about their performance in field training in schools and had limited choices regarding the subjects they studied before the field-training period. Most of these subjects were theoretical and student teachers were not given the opportunity to discuss or give opinions, which likely had a negative impact on their self-confidence. However, after the project was carried out, the results indicated that the student teachers had the opportunity to express opinions and discuss the ideas presented in the blog. This may be because the student teachers were able, through the project (ST-Edublog), to participate at any time, anywhere and at their own pace. This freedom not only allowed continuous learning but gave student teachers a review of past learning. The freedom to add a video tutorial to the teaching process and share with colleagues on the blog gave them the freedom to do what they wanted without external pressure.

The results of the questionnaires before and after the project showed that the student teachers’ self-confidence grew after the project. SDT assumes that human behaviour works on the appearance of consistently positive characteristics that appear to be in the form of effort and commitment to work in life. This is what the theory calls "trends of innate growth". It is acknowledged that individuals have internal desires and psychological needs, which are the core of internal motivation (Ryan and Desi, 2000).

This was particularly evident in the feedback of student teachers during the focus group interview, where the majority of students demonstrated that their integration into the project enhanced their self-confidence in many areas, such as confidence in their ability to use technology and deal with it in daily practice, their self-confidence in using technology in daily learning processes, and their ability to express their feelings and ideas.

However, with reference to the SDT model developed by Desi and Ryan (1985) to understand the factors that influenced motivation, it became apparent that the student teachers’ interest in participating in the project was the result of an internal motivation related to their desire to develop their performance during their training in schools. This was a major reason for the decision to participate in this project. If they passed the training, they would receive the bachelor's degree as per the regulations of the Department of Education in Saudi universities, so the student teachers were very excited about integration into this project and this was evident in the collected data.

The support of their colleagues in the project increased the internal motivations of the teachers, which was reflected in their artistic and behavioural creativity during the period of their training in school. This was evident in their responses to the focus group interview questions, where they found that the level of happiness and self-satisfaction increased and thus their self-confidence also grew, as explained by Ryan and Desi. They say that the more support others have for the three needs of autonomy, competence, and relatedness, the greater the internal motivation of the individual and the positive impact on his or her mental health and happiness (Desi and Ryan, 1995).

The quantitative data in Chapters Six and Seven showed clearly that the student teachers had gained in confidence through using Edublog. This confidence had then given them a sense of autonomy, the feeling that they could achieve success through their own motivation and ability.

The confidence level of users indicates the support and psychological affiliation with ST-Edublog as a learning tool. Farrand et al. (2010) argued that an enhanced level of confidence shows the motivation of student teachers to continue to benefit from the use of social computing applications. This also indicates that they have strong belief in the utility of educational blogs as a way to increase their knowledge. The confidence in their abilities to apply learning technologies acts as a motivational force that allows them to enjoy learning through the application of ST-Edublog (Yang, 2009). This in turn enhances students’ sense of autonomy.

### 8.3.2 Competence

The competency level of student teachers was also raised as a consequence of the use of ST-Edublog, although not to the same extent as other areas. This finding is interesting as it highlights the significance of the technological environment for student teachers, and their ability to acclimatise to social computing applications. The increase in competency was observed in the area of development of abilities for handling online learning technologies in order to express their feelings openly (Wang, 2009; Novakovich, 2016). The independent use of social computing applications is necessary to gain productive interaction with peers, learn effectively and take benefit of the interactive environment to generate, upload and download communicative contents in different formats such as audio, video and written contents.

The abilities of student teachers, who are millennial learners, include a quick aptitude for developing the skills of online learning (Lee and Bonk, 2016). Based on the findings, it can be argued that greater benefits of integration of social media applications can be achieved through the involvement of teachers and training institutions in providing technical support in initial phases of ST-Edublog-based learning projects. These measures are most likely to boost the confidence and competency of student teachers, which can result in meeting the objectives and goals of training programmes initiated by training institutions for teachers in Saudi Arabia.

Waters and Waters (1995) define study competence as the ability to study in which student teachers continued to develop their skills in teaching through interacting with other teachers, peer assessment and evaluation of classroom teaching. Study competence includes self-confidence, self-awareness and willingness to find out new information. The student teachers demonstrated the skills mentioned above because they were intrinsically motivated and, as a result, they were able to enquire into and share skills with other colleagues at the same time as developing strategies to solve problems encountered in the classroom. The results indicated that the competence of student teachers in the use of technology remained more or less the same after implementation of the ST-Edublog project as it was beforehand. This might be because, even though student teachers are millennial learners, they still require technical support in terms of using ST-Edublog like an experienced learner. This argument is supported by many studies that students’ competency in experienced use of social computing applications cannot be enhanced unless and until the mentoring and support programmes are coupled with implementation of educational blogs in the educational context (Redecker, 2009; Schneckenberg, 2009).

Another explanation for the lack of significant development in competency is that long-term engagement in ST-Edublog might have led to several questions on how to solve technology issues and online communications with peers. Because this project was not intended to offer any technical support to students, this resulted in a non-significant impact on the competency development of student teachers.

Many studies have outlined the importance of learning through social media, which helps to support autonomy in learning, whereas e-learning provides learning at any time and any place and can be used for taking responsibility for learning whenever convenient. However, Zamil's (2006) study showed that the autonomy of e-learning had been weakened by learners as they felt that they needed a face-to-face trainer; the reason for this may be due to the complexity of the site learners were using or a lack of experience in online learning. There are several studies showing that the autonomy of e-learning has helped to increase the competence of students (Keane et al,2010; Wid-Mark, 2008).

On the other hand, the results from the survey did not match the result from the qualitative data. Many student teachers agreed that the use of the ST-Edublog did help them to increase their competence. All of the above emphasises the effect of female students' need for competence in enhancing internal motivation; such motivation should have come from their training course at university but it seemed that these students were not competent enough for working in the field. They had little experience of teaching outside their university course, which was mainly theoretical, and there was a lack of practical support, which the student teachers needed for working in the classroom.

Though the ST-Edublog did not significantly impact the competence of student teachers in terms of the technical support, the data presented in Chapter Seven showed that the positive impact of using blogs was mediated by ST-Edublog in relation to class-management practices, and pedagogical, communication and interpersonal skills. This result shows the complex relationship of an ST-educational blog with the foregoing motivational factors affecting the use of ST-Edublog during training programmes. These outcomes are consistent with the theory (self-determination theory). Autonomy and freedom of choice are things which lead the individual to happiness and affect his or her work positively. Therefore, the data clarified the link between "the need for autonomy" and "the need for competence" and how far they are connected to each other in the individual's sense of happiness. In addition, the teachers' sense of competence was supported by a number of factors, such as the provision of guidelines by me or by their colleagues and the provision of feedback. ST-Edublog successfully produced a beneficial impact due to the foregoing factors.

The data demonstrated that the student teachers had many motivations, which led them to demonstrate higher competence in their performance. Most of these motivations were intrinsic and thus this made gaining expertise in teaching in schools a challenge as they wished to prove their experience and value. These intrinsic motivations included motivations for enhancing basic teaching skills, for achieving the dream of childhood to be a teacher, for change and creating something different in teaching, for helping others, and many more outlined previously. In short, it is clear from the data that the psychological need for competence leads the individual to search for challenges that enhance his or her basic skills.

### 8.3.3 Relatedness

The findings of this study revealed that the ST-Edublog was able to increase the interactivity experience of student teachers significantly, which promotes a sense of relatedness, the third element of SDT. The interactivity experience was enhanced through a greater level of student teacher participation in discussions and debates carried on ST-Edublog, the interactions of participants with each other and responding to each other. The in-time responses and communication increased the sense of relatedness and belongingness among student teachers, which resulted in improving their interactive experiences (Lee and Bonk, 2016; Rains and Keating, 2011).

The motivation to act and implement certain actions comes from the desire to solve certain issues. Student teachers face issues of managing classes, dealing with student’s queries in the classroom, and using the right set of pedagogical practices for becoming an effective teacher and gaining the reputation of being a useful teacher among students (Ryan and Deci, 2004; Byington, 2011). ST-Edublog afforded the opportunities to student teachers to learn about effective teaching strategies, and engage in discussion about topics such as students-related issues in the classroom and problems faced during the management of student behaviour, as was observed from the communication of student teachers on ST-Edublog.

The turning of student teachers to the online community on the ST-Edublog platform can be useful if they find cooperative people who can answer their queries (Williams and Jacobs, 2004). Hence, the presence of an interactive environment is highly beneficial and a prerequisite for student teachers to become satisfied with the social-computing-mediated learning initiatives (Joshi and Chugh, 2009; Farmer et al., 2008). This bears significance for the student teachers and educational institutions. Student teachers need to structure productive online communities for dissemination of reliable and trustworthy data while respecting the social norms and feelings of others during their communication with peers. This is paramount for generating the interactive environment which can benefit members of the community of practice on ST-Edublog.

The sense of community was reported by my study as an important antecedent of learning satisfaction among student teachers through the use of ST-Edublog. The sense of community creates feelings of belonging to the learning community and environment. Self-determination theory proposes there is an element of relatedness to the self-regulation and motivation of students (Williams and Jacobs, 2004; Top, 2012). Intrinsically motivated students can better interact with each other, collaborate with each other, and learn at their own pace. The traditional learning environment cannot adequately support the sense of community among students due to spatio-temporal constraints (Tang and Lam, 2014; Chung and Nah, 2009). However, the virtual learning environment supported by ST-Edublog supplies an effective environment in which student teachers can assist and collaborate with each other (Shackelford and Maxwell, 2012). Therefore, students should interact with each other to create a community of practice which should be stabilised with respect and offering positive and constructive feedback on issues raised by peers.

The key element in a group is teamwork and acceptability. As student teachers engaged with each other, there was also a need to belong, which Ryan (2009) refers to as relatedness. This is further explained as being valued and genuinely accommodated within a group. The findings indicated that technology gave an opportunity for student teachers to reply to other students’ questions on ST-Edublog. The interaction of student teachers with each other increased, which suggests the need among student teachers for relatedness and a sense of belonging to a group of like-minded people. According to the quantitative data in Chapter Seven, the sense of belonging was significantly improved, and it had a significant impact on the learning satisfaction of students.

Therefore, agreement about the importance of social communication among student teachers after the ST-Edublog project was a key factor in signalling its success as a learning and training tool. The sense of community encouraged them to be enthusiastic and active on the blog as explained by the qualitative and quantitative data in Chapter Seven. This raised the student teachers’ levels of motivation, according to SDT theory. Findings outlined in Chapter Seven indicated that many forms of motivations appeared which enhanced their feeling of relatedness to each other, such as motivation for group creativity, providing supporting circumstances and exchanging results from personal practices. It is likely that these motivations are some properties of the community of practice. Senge (1995) indicated that we could look at the community of practice as a group of individuals connected with each other and the surrounding world. Interaction occurs between them and they have three properties in common: creative thinking, lifetime learning, and cooperative learning.

In addition, some scientists, especially psychologists, believe that the need for autonomy is contradictory to the need for relatedness or the need to communicate with others (Jordan, 1997). This difference may be due to their perception of autonomy as being related to individuality and egotism. However, Ryan and Deci (2011) argued that individuality and egotism are not synonymous with autonomy, indicating that autonomy means volition, willingness, and endorsement. The findings indicate that the student teachers felt a sense of accomplishment when their colleagues appreciated them, and this is consistent with self-determination theory (SDT). It is arguable that the individual does not feel accomplishment except through the appreciation of other individuals, no matter how competent he or she is in an area of work. Giving student teachers some control over their own learning environment in ST-Edublog, helped to strengthen their connection with each other, which in turn enhanced their competence and their autonomy.

This is consistent with the findings of Newstead and Hoskins (2008), who argued that self-autonomy is achieved by adoption of a method that obliges pupils to make decisions about their education and gives them some control over the learning environment. This was a key feature of the use of blogs. The student teachers were suggesting topics for discussion and had full freedom to ask questions and express themselves. All these things meant they could make decisions for themselves and granted them self-autonomy.

Overall, the exploration of the four research sub-questions enabled me to address the over-arching research question “How successful is the use of blogging technology as a tool for developing the learning, skills and self-determination of student teachers in Saudi Arabia?” The study demonstrates that blogs can be a very useful technology in this regard, and is of value in the context of Saudi Arabia, where traditional approaches to teacher education, in which students’ self-determiniation has not been a priority, have been prevalent.

## 8.4 Limitations of the Study

This research study has some limitations, despite the justified research design and careful approach adopted when planning this research project. The first limitation is related to the participants of this study. The number of participants was relatively small, featuring 20 participants, which was justified for the focus groups but was smaller for the surveys, as the recruitment of 50 or more participants is normally recommended in order to constitute a sufficient number of survey participants. The small number of participants prevented me from using reliability tools such as Cronbach’s Alpha to assess the internal consistency of the questionnaire for surveying the perceptions of the student teachers.

Moreover, all student teachers were young, in the age range of 21 to 24, and were Bachelor students studying the Bachelor degree in Education. Though previous studies have conducted the research on participants with these characteristics, the perceptions of the participants might be biased about the utility of ST-Edublog due to their previous exposure to the online learning tools during their studies. Perceptions recorded by student teachers might not be representative of the majority of student teachers in universities. This research only focussed on the student teachers from a single university in Saudi Arabia, which affects the generalisability of the data to student teachers in other studies due to the lack of homogenous characteristics between the participants. As the purposes of implementing technological applications for learning vary from university to university, the student teachers from different universities might have different levels of computer skills and exposure to the social computing applications.

In addition, the outcomes of this research can only be applied to teachers in the training phase, and utmost care should be taken to interpret these findings to student teachers using only written assessments during their courses. Due to limited time and resources, I could not make observations of the type of communications conducted by student teachers on ST-Edublog, instead I used the reflective diaries of student teachers. The contents of the reflective diaries might have exaggerated the perceptions and feelings of the students, however, which could bias the interpretation of the data.

Furthermore, most of the research activities focussing on the use of blogging tools in increasing student learning in a Saudi context were restricted to the students studying English as a second language. This means that there was a scarcity of data on educational blogs increasing the effectiveness of training teachers. Therefore, studies from foreign contexts were used to interpret the data.

## 8.5. Implications of the study for educational and training institutions

The study has a number of implications for policy and practice. Blogging is an important instrument which can be used for learning, for leisure and for general communication, depending on the mindset of the users (Yang, 2009). Various researchers have emphasised that blogs are the most productive learning tool when customised to the learning needs of institutions and students. As the institutions and teachers are involved in planning, organising and administrating the learning activities, self-determination theory stresses the involvement of structuring learning activities along with students in order to cause autonomous extrinsic motivation among students (Ryan and Deci, 2000). The higher the level of extrinsic motivation, the higher the drive to use and obtain benefits from the educational blogs (Niemiec and Ryan, 2009). Several studies have shown direct support is offered by teachers to students on how to plan activities and use the various features of educational blogs in their beginning phase. This resulted in greater motivation for students to show interest in using blogs continuously (Novakovich, 2016; Byington, 2011; Joshi and Chugh, 2009).

Studies have shown that millennial learners, though they have skills to use digital technologies for communication, are not equally expert in handling the various features of social computing applications. Students are often reportedly facing challenges in solving issues relating to digital technologies, which can demotivate them from using such technologies (Kori et al., 2014). Foster and Kesselman. (2003) thought that students might not be aware of the technological affordances of the emerging social computing applications; therefore, the responsibility falls on teachers and educational institutions to develop the cognitive abilities of students to gain confidence and competence through productive use of social computing applications. The main issue most of the students face is combining different functions to build their competence.

The organisational leadership can prepare the cognitive framework and protocols, which can be explained to the students with robust supporting arguments and convincing explanations prior to implementation of social computing projects. SDT and the proponents of SDT argued that explanatory notes attached to available learning choices result in better adherence to the usage of social computing applications. Hence, teachers and educational institutional management should foster the general understanding among student teachers about the utility and use of educational blogs. As Saudi society is a collectivist society, as argued by Hofstede’s cultural dimensions (Cassell and Blake, 2012), this suggests that teachers’ suggestions and recommendations are highly regarded by students. Hence, the support and proper guidance about using educational blogs are most likely to create a positive influence on the usage patterns of educational blogs, thereby developing the skills and knowledge of student teachers.

Academic staff involved in training student teachers should collect data about the learners’ interests, preferences and needs, which should further be utilised to develop and customise the educational blogs. Previous studies have supported idea that students’ learning will improve if they are satisfied with the blog’s features, usefulness and ease of use, which supports the findings of this study (Lai and Chen, 2011 ; Tyagi, 2012). The incorporation of student needs in the design of educational blogs can lead to better satisfaction of learning needs, thereby realising the potential role of blogging technology in increasing the learning and skills development of student teachers (Goh et al., 2010; Nawaz, 2013; Philip and Nicholls, 2009). In addition, development of educational blog-based learning projects should be aligned with the technological objectives and pedagogical practices of educational institutions. This is useful for making educational blogs as an institutional sponsored learning strategy rather than externally controlled platforms in public domains which can expose students to distractions from learning paths through advertisements (Dowdell et al., 2011; Marchant et al., 2017).

Updates about courses, training events, feedback on training events, and direct presence of teachers as bloggers should be carried out on a regular basis on educational blogs, so that students can ask a question about training programmes, give feedback on the contents, and download the useful material as posted by teachers to develop key pedagogical practices in order to be productive teachers. The active support from teachers can come in handy for student teachers as an aid in training improvement, which might involve demonstrating different functionalities supported by ST-Edublog or other similar educational blogs tailored to student needs.

It is not an easy task to implement the recommendations provided in this section within a learning system as conservative and traditional as that of Saudi Arabia. It requires the complete overhaul of teaching and training strategies by aligning them to the technological objectives set by Vision 2030. Vision 2030 has provided a foundation for practitioners to develop a digital technology-oriented teaching and training culture (KSA Budget Report, 2017). The collaboration with governmental agencies working to implement the digital education transformation programme, such as the Ministry of Education in Saudi Arabia, can be beneficial in terms of helping to change the traditional organisational culture of training to a culture with embedded functions of technologies to support the education and training programmes at universities.

This study revealed the collaborations and interactions via ST-Edublog as useful dimensions for increasing the student teachers’ satisfaction with learning. Therefore, it is suggested that educational institutions should encourage student-student and student-teacher collaborations, which are reported to create the sense of community, belongingness and relatedness of students in the learning environment. The sense of community was found in this study to play an important role in increasing the intrinsic satisfaction of student teachers, which does indicate the importance of the sense of belonging to the learning community and the environment in which learning takes place. The collaborations facilitated by institutions create stability in interactions, organise the patterns of communication, and stimulate debates on various topics of interest (Byington, 2011; Hsu et al., 2014; Tinoca et al., 2010).

Therefore, the involvement of teachers and leadership of educational and training institutions in Saudi Arabia, especially in the area of training pre-service teachers, is expected to motivate student teachers to participate in training and accomplish collaborative training projects. This suggestion should be implemented along with changing the culture or organisational mindset towards adopting technological advances to promote the knowledge and skills of student teachers. Services such as planning and strategies to implement support can be sought from governmental bodies offering assistance to promote the integration of social applications in the learning environment.

## 8.6. Implications for application developers

The findings of this study offer implications for application developers who are engaged in developing educational blogs with the purpose of enhancing the knowledge and skills of students. The design should consider the needs of the students depending on their level, experience and age group. Educational blogs should be designed with the purpose of enhancing the maximum engagement of student teachers with peers. Tracking of the learning and skills should be measurable and needs to be part of the design. For example, the application developed can provide two main sections - ‘confidence’ and ‘competency’ – within the design of the blogs, which should be able to promote confidence and competencies of student teachers coming from peer-to-peer interaction in an interactive environment supported by multimedia functions. If the bloggers can develop the design with play and learn functions, it will help students to learn while playing, as leisure and enjoyment/leisure are reported to be beneficial to the learning satisfaction of students in this study (Niemiec and Ryan, 2009).

The ease of use was reported as a strong dimension affecting the learning satisfaction of students in this study. This influence should be increased by keeping the design of the blogs simple, enriched with graphics and single-touch buttons in order to access the required content. The feedback, assessment and questioning sections need to be incorporated into the structure of the educational blogs, so that useful strategies can be adopted by teachers in order to teach and train the students effectively. In addition, these features are useful for assessing the quality and usefulness of the content exchanged between peers.

The testimonials page could be helpful with its record of problems solved by the teachers and experienced students. This can lead to identification of leaders in the teaching fields, which can direct novices to the right people to find the solutions for issues faced by student teachers during the training phase. The feature of calculating ‘number of hits’ should be introduced, which will allow the researchers to capture a snapshot of the popularity of educational blogs based on the number of visits per day. A ‘complaint’ section should also be created by educational bloggers for them to lodge a complaint about threats to their security or privacy, or incidents of bad behaviour during interactions with peers. This will motivate users to have productive interactions while using educational blogs.

## 8.7. Future research directions

This research work laid the foundation for assessing the effectiveness of blogging technologies for training teachers. However, this study could not assess the impact of blogging on student teachers’ motivation to use Edublogs in the long run. Any future research should be designed with longitudinal research design in order to examine the impact of blogs on long-term extrinsic and intrinsic motivation. The ultimate purpose of blogs is to satisfy the objectives of teachers’ training needs, such as furnishing them with an adequate level of skills for managing the classes and pedagogical competencies of teachers. The future research work should also consider the evaluation of the blog’s influence on the application of skills and learning acquired by student teachers through the use of blogs to the real-time classrooms and course management systems in the respective schools.

The incorporation of student teachers’ needs for learning and skills development are critically important for making any digital-technology-based learning projects successful. Future research should run pilot studies to determine student teachers’ needs, so that they can be incorporated into the design of the edublogs. This study only used 20 student teachers for implementation and post-implementation surveys and targeted a single university for recruitment; future studies should consider the recruitment of around 40 to 50 participants from more than one university in order to generate the versatility and generalisability of the findings.

This study provided some insight into the benefits of edublogs in increasing competence, confidence and engagement in the digital-technology-driven learning system. The Vision 2030 has initiated many other digital-technology-based learning projects, and future research should consider measuring and evaluating the impact of social computing applications in different educational settings such as Smart Schools and virtual universities. This is most likely to reveal the barriers and success factors for social applications in the learning environment. Moreover, the adoption of edublogs from the perspective of management in educational institutions should be investigated in future studies, as ST-Edublog and other similar digital learning programs can be implemented with the cooperation and acceptance of the institution’s management.

## 8.8. Conclusion

Despite the versatility of blogs, the research work on educational uses of these tools is limited. Infinedo (2018) described that blogs serve as powerful instruments for fulfilling the needs of learning environments due to features of social interactovity. Chen et al. (2015) posit that research gap into technological affordances of blogs is due to the focus of the existing literature on the developments and utility of e-learning tools and design of e-courses.

This thesis has tried to fill the gap in the explorarion of Saudi Arabian student teachers’ experiences with e-learning tools in general and in the use of the Edublogs system in particular. I have demonstrated how learners’ experiences can be enhanced through the use of educational blogs. The motivation to engage in educational blogs is mainly derived from the blog features such as ease of use, usefulness, archiving features, and multimedia components, which provide pleasant and constructive learning experiences to student teachers.

The data from this study contributed to enhancing understanding of the utility of blog use by Saudi student teachers in a specific higher education learning setting**.** More specifically, the topic under investigation is significant for a number of reasons. First, the ST-Edublog application developed and implemented in this study was in itself significant in terms of increasing the possibilities of collaborations, establishment of communities of practice and enhancement of competencies, autonomy and sense of belongingness within the learning environment. The blog is an internet application whose popularity increases continuously and, as Bruns and Humphreys (2005) argue, its influence as a tool of communication is recognised by many researchers and practitioners.

This research has provided useful insight to instructional designers, administrators, and technology experts in Saudi Arabia into the potential of educational blogs as a learning tool for fulfilling the training needs of student teachers, such as managing the tasks in relation to providing constructive interactions in online learning environments. As emphasised by the results of this study, not all social computing tools are appropriate in a particular socio-cultural context. This research yielded useful data with which to create educational blog-based curricula and learning platforms, which could be tailored to suit the learning needs of individual students, and facilitate online assessment and feedback and useful interactions between students and teachers. Its main goal is to introduce a hybrid communication system in which e-learning supports classroom learning.

This study is unique in the context of Saudi educational and training institutes in discovering the potential of educational blogs in maximising collaboration and communications among peers and student teachers. Assessing training objectives for student teachers, Beldarrain (2006) predicts that the roles of teachers will change in the future. The role of the teacher, in the author’s opinion, might change from acting as a monitor and facilitator to a 'partner in learning'. Beldarrain (2006) notes that this new instructor role will consequently change the role of the student as a contributor of knowledge. This change of roles is most likely to offer a challenge for students to think upon reflectively and critically.

This research has discovered the potential of educational blogs in increasing the level of reflection and critical thinking through communications with people from different educational backgrounds and with a variety of experiences. Results of this study provide an empirical support to the argument raised by Beldarrain (2006) that blogging advancements present new teaching models which promote teaching new ways of learning by fostering the involvement of students with each other and with their instructor. Therefore, this study contributes to a new educational blog-based learning model in Saudi Arabia in which the instructor and the student can interact with each other to achieve better learning outcomes.

Technology plays a great role in supporting communication between distant users. However, it may cause alienation and frustration for some (Abrahamson, Daviault and Coelho, as cited in Dickey, 2004). As identified by Hara and Kling (2000, p. 557), one source of student stress is the lack of ‘prompt unambiguous feedback and technical problems for both traditional and distributed learning’. According to Dickey (2004), this stress may have a bad impact on the academic experience. In order to provide a comfortable learning environment for learners, we should look for technologies that relieve learners from feelings of isolation, distress and frustration. Therefore, the current study explored how far Edublogs as a new technology may provide a good solution for feelings of isolation and alienation.

The data provided by this research also contributes to the existing literature on the utility of blogs in improving student teachers’ experiences. The outcomes of this study might motivate researchers in Saudi Arabia to conduct similar research on the effectiveness of integrated blogging platforms in increasing the skills of teachers during their training programmes.

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# APPENDICES

**Appendix A: Approval Letter for execution of Research Project**



**Dear Asma**

**PROJECT TITLE:** The uses of edublogs in Saudi Arabia higher education

**APPLICATION:** Reference Number 004619

On behalf of the University ethics reviewers who reviewed your project, I am pleased to inform you that on 27/11/2015 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 004619 (form submission date: 26/10/2015); (expected project end date: 31/01/2017).
* Participant information sheet 1012825 version 1 (26/10/2015). Participant consent form 1012826 version 1 (26/10/2015).

The following optional amendments were suggested:

*Please carry out corrections as suggested by Review 1.*

If during the course of the project you need to [deviate significantly from the above-approved documentatio](about:blank)n 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

David Hyat

Administrator School of Education

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](about:blank)

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](about:blank)

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.

# Appendix B: Consent Form filled in by Participants

Name of Participant:

Addressee :

email:

Mobile no:

I, the undersigned, confirm that (please tick box as appropriate):

|  |  |  |
| --- | --- | --- |
| 1. | I have read and understood the information about the project, as provided in the Information Sheet dated \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. | 🞏 |
| 2. | I have been given the opportunity to ask questions about the project and my participation. | 🞏 |
| 3. | I voluntarily agree to participate in the project. | 🞏 |
| 4. | I understand I can withdraw at any time without giving reasons and that I will not be penalised for withdrawing nor will I be questioned on why I have withdrawn. | 🞏 |
| 5. | The procedures regarding confidentiality have been clearly explained (e.g. use of names, pseudonyms, anonymisation of data, etc.) to me. | 🞏 |
| 6. | If applicable, separate terms of consent for interviews, audio, video or other forms of data collection have been explained and provided to me. | 🞏 |
| 7. | The use of the data in research, publications, sharing and archiving has been explained to me. | 🞏 |
| 8. | I understand that other researchers will have access to this data only if they agree to preserve the confidentiality of the data and if they agree to the terms I have specified in this form. | 🞏 |
| 9. | Select only **one** of the following:   * I would like my name used and understand what I have said or written as part of this study will be used in reports, publications and other research outputs so that anything I have contributed to this project can be recognised. * I do not want my name used in this project. | 🞏 |
| 🞏 |

**Participant name: Signature:**

**Date:**

**Researcher name: Signature:**

# 

# Appendix C: Pre-implementation Questionnaire

**First Questionnaire**

**Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ marital status: \_\_\_\_\_\_\_ Age: \_\_\_\_\_\_\_**

1. Check (✓ ) the option that corresponds to your agreement with the following statements:

**1** = Strongly agree **2** = Agree **3 =** Strongly disagree

**4** = Disagree **5** = Neither agree nor disagree

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **No.** | **Item** | **1** | **2** | **3** | **4** | **5** |
| **Can you rate how confident you feel in below statements?** | | | | | | |
| 1. | I was able to use technology for everyday practicing. |  |  |  |  |  |
| 2. | I was able to use technology for learning process. |  |  |  |  |  |
| 3. | I was able to use technology for express my feeling and thoughts. |  |  |  |  |  |
| **Tell me how competent you feeling in flowing:** | | | | | | |
| 1. | I am able to use the online technology. |  |  |  |  |  |
| 2. | I always need for the technical support when I access the social media. |  |  |  |  |  |
| **Can you explain the interactive environment of technology by answering the below statements:** | | | | | | |
| 1. | The technology gave me opportunities to communicate with people. |  |  |  |  |  |
| 2. | I always respond to social mediaentries |  |  |  |  |  |

**Appendix D: Post-implementation Questionnaire**

# Second Questionnaire

**Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ marital status: \_\_\_\_\_\_\_ Age: \_\_\_\_\_\_\_**

1. Check (✓ ) the option that corresponds to your agreement with the following statements:

**1** = Strongly agree **2** = Agree **3 =** Strongly disagree

**4** = Disagree **5** = Neither agree nor disagree

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **No.** | **Item** | **1** | **2** | **3** | **4** | **5** |
| **Can you rate how confident you feel**  **in below statements:** | | | | | | |
| 1. | I was able to use technology for everyday practicing. |  |  |  |  |  |
| 2. | I was able to use technology for learning process. |  |  |  |  |  |
| 3. | I was able to use technology for express my feeling and thoughts. |  |  |  |  |  |
| **Tell me how competent you feel**  **in below statements:** | | | | | | |
| 1. | I am able to use the online technology. |  |  |  |  |  |
| 2. | I always need for the technical support when I access the social media. |  |  |  |  |  |
| **Can you explain the interactive environment of technology by answering the below statements:** | | | | | | |
| 1. | The technology gave me opportunities to communicate with people. |  |  |  |  |  |
| 2. | I always respond to social mediaentries |  |  |  |  |  |

**Appendix E: Post-implementation survey**

**Third Questionnaire**

**Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ marital status: \_\_\_\_\_\_\_ Age: \_\_\_\_\_\_\_**

Check (✓ ) the option that corresponds to your agreement with the in below statements:

**1** = Strongly agree **2** = Agree **3 =** Strongly disagree

**4** = Disagree **5** = Neither agree nor disagree

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **No.** | **Item** | **1** | **2** | **3** | **4** | **5** |
| **ST-EDUBLOG INTERACTIVE ENVIRONMENT** | | | | | | |
| 1. | The features of the ST-Edublog including hypertexts, comment buttons, and the ordering of blog entries (so that newer material is shown first) allow me to interact with others.. |  |  |  |  |  |
| 2. | ST-Edublog helped me to learn effectively from my instructors and peers through the web discussions. |  |  |  |  |  |
| 3. | The ST-Edublog gave me opportunity to communicate with my instructor and peers. |  |  |  |  |  |
| 4. | The archiving feature of ST-Edublog allowed me to look back at my previously expressed ideas and comments provided by my peers. |  |  |  |  |  |
| 5. | Supportive multimedia in ST-Edublog consolidated my understanding of the content discussed. |  |  |  |  |  |
| 6. | I could easily access the ST-Edublog |  |  |  |  |  |
| **Experience of online interactivity** | | | | | | |
| 7. | The ST-Edublog enabled me to share my training experiences with my peers. |  |  |  |  |  |
| 8. | The online interactions using ST-Edublog were easy and clear |  |  |  |  |  |
| 9. | The online interactions supported by ST-Edublog help me to improve my teaching skills. |  |  |  |  |  |
| 10. | The online interactions supported by ST-Edublog were useful for gaining a clear understanding of concepts during my training at schools. |  |  |  |  |  |
| **Feelings towards experience as a whole** | | | | | | |
| 11. | I enjoyed the learning experience with ST-Edublog |  |  |  |  |  |
| 12. | I felt isolated from university society due to ST-Edublog. |  |  |  |  |  |
| 13. | I am satisfied with how the ST-Edublog performed as a learning tool during my training. |  |  |  |  |  |

# Appendix F [Example of focus groups interviews Questions]

# How you find the experiences using the blog during the training section?

# Tell us about something that you written? Why?

# Where the something you want to share in blog?

# How did you respond for the post?

# Do find it interesting to use the blog during the training?

# How do you feel the blog impact in learning?

# Is it help to teaching practice?

# What kind of social media you used? why?

# Tell us about the advantage and disadvantage of twitter?

# Tell us about the advantage and disadvantage of snapchat?

# Tell us about the advantage and disadvantage of Instagram?

# Tell us about the advantage and disadvantage of email?

# Tell us about the advantage and disadvantage of blog?

# Tell us about the advantage and disadvantage of Facebook?

# Tell us about the advantage and disadvantage of whatsapp?

# Tell us about the advantage and disadvantage of YouTube?

# How you find the experiences using the ST-Edublog during the training section?

# Tell us about any differences happened after ST-Edublog ?

# What the impact of ST-Edublog on your interaction?

# What the impact of ST-Edublog on your feelings of competence?

# What the impact of ST-Edublog on your feelings of relatedness?

# Appendix G [Reflective diary]

# Name : \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Age: \_\_\_\_\_\_\_

# Answer these three questions in your own words:

# Do you feel comfortable or anxious during and after ST-Edublog project? Elaborate.

# What are your comments on ST-Edublog in general?

# How does the ST-Edublog help you during the training course in school?

# .

# Appendix H: Table of themes and codes

|  |  |  |
| --- | --- | --- |
| Themes | Sub-themes | Codes |
| Perceptions of social media use | learning | Helpful in learning about family |
| Helpful to find the information |
| Find social media really useful for learning |
| Perceptions of snapchat | Information about daily activities | Snapchat downloaded on recommendation from family members |
| Easier way to be connected to family and friends |
| Best platform to share family moments with friends and other family members |
| Discussion about class activities | Lecture time, general information about classes |
| Perceptions of YouTube | Learning | Good for learning material |
| Lack of quality learning material |
| Find animated clips, but not in education |
| Mostly useful for science subjects |
| Perceptions of WhatsApp | Source of communication | Communicate with family members |
| Communicate with friends |
| Social information | Obtain information about politics |
| Collect information about events, social activities |
| Perceptions of Instagram and Facebook | Networking | Help me to create networks with friends |
| Discussion about classes | General information about training dates |
|  | Information about training venues |
| Perceptions of email | Professional use | Emails are used more for professional communication |
| Not suitable for learning and knowledge gaining |
| Hacking | Emails can be hacked, not used for sharing confidential information |
| Not effective way of communication | In Saudi Arabia, people are not used to reply emails quickly |
|  | Email are not effective means of communication in Saudi culture |
| Perceptions of blogs | Learning | Blogs are useful source of posting articles |
| Reading useful material for gaining more information about subjects |
| Experience-sharing platform | Blogs are used to share experiences |
| Communicate experiences in real world |
| Lack of subject specific blogs | Blogs specific to subjects are not available |
| Privacy issues | Drawbacks of social media applications | Lack of privacy on some on line platform |
| Social media applications are managed by third parties |
| Advertisements are distractions |
|  | Prone to attacks |
| ST-Edublog | | |
| Ease of use | Design | Design is easy and interesting |
|  | Enabled me to post questions related to my subject |
| Communication | Expression of thoughts | Thoughts and experiences can be shared easily |
|  | Sharing of knowledge | Knowledge is shared in multiple formats (audio, video, articles) |
| Compatibility | Features compatibility | Features are good in enabling users to post questions and articles |
| Interactive environment and relatedness | Networking | Connection with peers, networks development |
| Helping each other | Peers helped each other |
| Sense of community | Gave me feeling to part of learning community |
|  | ST-Edublog brought us closer to each other |
|  | Feeling of being in a family |
| Impact on learning and competence | Concept development | ST-Edublog helped me to obtain accurate information |
| Attain knowledge through interaction with peers in real world |
| Helped me to prepare lessons |
| Enhanced my professional development |
| Skills development | ST-Edublog improved my writing skills |
| Enhanced my reading and comprehension skills |
| Development of my own ideas after reading comments from peers on ST-Edublog |
| Class management skills | ST-Edublog helped me to manage classes effectively |
| Improved my relationships with students and colleagues |
| ST-Edublog helped me to control students, managed discussions in the classroom |
| Confidence and sense of autonomy | Confidence | ST-Edublog made me confident |
| ST-Edublog reduced my shyness and hesitation |
| I can share my views without feeling embarrassed |