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**Exploring Social Collaborative e-Learning in Higher Education:
A Study of two Universities in Uganda**

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Abstract

The emerging social collaborative technologies such as Facebook and Twitter are greatly influencing the evolution of e-learning in higher education. As these technologies become more easily available to students and lecturers, the approach to e-learning continues to evolve leading to a social collaborative e-learning (SoCeL) model. SoCeL involves social interactions and collaborations among students and lecturers in order to make it easy for them to construct and share knowledge. They exchange ideas and share their own digital products using these technologies to facilitate learning. Studies have however, shown that using social collaborative technologies in the learning process has not always had definite success. This may be attributed to lack of a framework to guide effective integration. The perceived absence of suitable frameworks is addressed in this work by developing frameworks to guide effective integration of SoCeL.

This empirical study follows the requirements engineering process and uses a mixed methods approach involving case study and human-computer interaction ethnography to explore the environment in which social collaborative technologies are adopted in two universities in Uganda. Data were analysed using qualitative and quantitative approaches to establish requirements for SoCeL effective integration.

The findings of this study are grouped in two broad areas: learning environment and adoption of social collaborative technologies. Based on these findings, the SoCeL environment framework and SoCeL adoption frameworks were developed. These provide the basis on which important recommendations are made. In conclusion, the thesis argues that SoCeL can be effectively integrated in higher education if the learning environment focuses on an integrated design. The design should bring together: informal learning, social networking and learning management.

Declaration

I confirm that this is my own work and the use of all material from other sources has been properly and fully acknowledged.

Acknowledgements

This thesis symbolises a milestone of my life – a long journey of my PhD research – yet it also starts another to extend and use the knowledge gained. This PhD journey took me through experiences and hurdles, the completion of which, demonstrates my conceptual and intellectual development. The achievement does not only show my efforts but of others whose support, guidance, and contributions were invaluable and to whom I owe gratitude.

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List of Acronyms

API	Application programming interface
CD Rom	Compact disk read-only memory
CLA	Connected learning analytics
CoP	Community of practice
HCI	Human-computer interaction
HCIE	Human – computer interaction ethnography
IBM	International business machines corporation
ICT	Information and communications technology
LMS	Learning management system
LRS	Learning record store
MOOCs	Massive open online courses
MUELE	Makerere University e-learning environment
OECD	Organization for economic co-operation and development
PC	Personal computer
PDA	Personal data assistant
PLE	Personal learning environment
PLN	Personal learning network
SNT	Social networking tool
SNS	Social networking site
SoCeL	Social collaborative e-learning
SPSS	Statistical package for the social sciences
TAM	Technology adoption model
TV	Television
UI	User interface
UPS	Universal primary education
USE	Universal secondary education

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Chapter 1

Introduction

This chapter provides the background of this research, highlighting the trend of e-learning in higher education. It also explains the research context and focus, as well as the motivation of this research. In addition, the key concepts and terms used in the thesis are defined. The research aim, objectives, and questions are also presented before outlining the rest of the contents of the thesis which has been presented in section 1.4. However, the summary of the contributions made by the research to the body of knowledge including the publications made during the study are presented in Chapter 8, where limitations and suggestions for further research have also been made.

1.1 Background

The use of social collaborative technologies such as Facebook and Twitter is increasingly becoming a common trend in higher education (Benson, 2014). Recent studies (Xu et al., 2015; Lytras et al., 2015; Lewis, 2015b; Bunney, 2015; Swan et al., 2014; Okada, 2012) suggest that this trend has led to the continuous evolution of e-learning, resulting in what is referred to in this thesis as social collaborative e-learning (SoCeL).

A definition of the SoCeL is given in 1.2.1 and a conceptual framework detailing this concept is presented in Chapter 3. However, it is important to note that SoCeL focuses on learning which is characterized by interactions (Wan, 2016; Violante and Vezzetti, 2015; McLaughlin and Rhoney, 2015; Alenezi and Shahi, 2015; Elgamal et al., 2013; Lin and Bhattacherjee, 2008; Kalyuga, 2007; Zhang, 2005; Smith et al., 2005; Ghaoui and Janvier, 2004) and collaborations (Du et al., 2012; Xu et al., 2015; Bunney, 2015; Okada, 2012; Kahiigi Kigozi, 2012; Eysenbach, 2008; Kelly, 2002; Wessner and Pfister, 2001).

This kind of learning model emphasizes informal sharing and construction of knowledge among participants using social collaborative technologies as their primary means of communication or as a common resource (Kassens-Noor, 2012; Vivian, 2011; Selwyn,

2007; Trentin, 2005; Sefton-Green, 2004). In many institutions of higher learning, lecturers and students are using these technologies to support their learning (West et al., 2015; Zhou et al., 2014; Thompson et al., 2014; Prestridge, 2014). Studies (Tess, 2013; Zaidieh; Shewmaker, 2014) have however shown that using these technologies to enhance the learning process have not had definite success. Success in this case refers to attainment of a desired outcome (expectations) especially in terms of the impact on the delivery and quality of learning (Kahiigi Kigozi et al., 2011). Lewis and Wilson (2011) argues that IT initiatives particularly, software systems are often implemented without strategy, policy or detailed project planning and therefore they may fail to deliver the desired outcome. As suggested by these studies, there are several challenges which contribute to the failure in implementing e-learning using those technologies; Lack of frameworks to guide the effective integration of these technologies can be one of them.

This thesis documents a study that was conducted in two Ugandan universities to explore the adoption of social collaborative technologies by students and lecturers. It is an exploratory study based on an interactive model of research design (Maxwell, 2012) and it focuses on designing a framework to guide the integration of SoCeL in higher education. This empirical study draws from requirements engineering process and uses a mixed methods approach involving case study (Yin, 2011; Yin, 2009; Yin, 1993) and human-computer interaction ethnography (Hollan et al., 2000; Martin et al., 1997; Nuseibeh and Easterbrook, 2000). The purpose was to understand the environment in which social collaborative technologies were adopted within those universities and draw lessons that others can learn from whilst choosing to adopt social collaborative technologies for learning support.

A conceptual framework for SoCeL was designed (see Chapter 3) and used to design the data collection tools. Survey questionnaires, interviews, focus group and participant observation were used to obtain data presented in this thesis; the data were also used to validate the framework. From the data that were initially collected using survey questionnaires, an analysis was carried out in order to understand the environment in which students and lecturers use social collaborative technologies to support the learning process.

Both qualitative and quantitative techniques were used to analyse these data and identify the requirements for learning environment and technology adoption based on the participants' experience. To validate these requirements and to carry out further qualitative exploration, three other techniques – interviews, focus groups, and participant observation were conducted. These methods are useful for validating software requirements and design

specification (Boehm, 1984; Nuseibeh and Easterbrook, 2000) and also in ensuring respondent validation and triangulation, which are important in increasing validity of qualitative data (Maxwell, 2012).

The requirements identified in terms of SoCeL environment and technology adoption, were used to develop the SoCeL integration frameworks which are presented Chapter 7 of this thesis. Additionally, important conclusions and recommendations have been made (Chapter 8) based on these frameworks. It is hoped that practitioners and researchers can draw lessons from this work in order to advance efforts towards effective use of social collaborative technologies for learning in higher education. The next section presents an overview of e-learning in higher education focusing on Uganda.

1.1.1 e-Learning in higher education

e-Learning has become an important mode of delivery of education and it is changing the traditional learning concept (Pathak, 2016). This study focuses on e-learning in two universities in Uganda. The term e-learning is used to describe the mode of education delivery involving the use of information and communications technologies (ICTs); it is meant to support and transform learning ubiquitously especially when it involves use of mobile technology (Kahiigi et al., 2007). There are many technologies, for example; learning management system (LMS), social networking sites (SNS) and mobile phones, that can be used to support e-learning. These technologies are available to lecturers and students to use in facilitating their educational activities and they have the potential to support and transform education (Player-Koro, 2012; Mwalongo, 2012; Maleki et al., 2012).

In Uganda there has been an increasing demand for higher education, attracting both local and foreign students (Mahajan, 2016). This has resulted in big numbers of students enrolling into the various public and private universities (Tumuheki et al., 2016). The Uganda government's policies on universal primary education (UPE) (Kahiigi Kigozi et al., 2008a), and universal secondary education (USE), further increases the demand for higher education (Barungi et al., 2015). This demand has resulted in adoption of e-learning as an important strategy to deliver education to vast numbers of students (Mayoka and Kyeyune, 2012).

Makerere University for example, implemented its first e-learning using LMS based on the Blackboard platform, and has since been replaced by another LMS called Makerere University e-learning environment (MUELE) based on a Moodle platform (Makerere University, n.d). Other universities also followed suit (Mayoka and Kyeyune, 2012). There

continues to be challenges such as cost, quality and demographics (Kituyi and Tusubira, 2013), which affect implementation and adoption of e-learning in Uganda, like other developing countries (Ssekakubo et al., 2011). However, as newer technologies continue to emerge, their usage by students and lecturers contribute to the evolution of e-learning (Kahiigi Kigozi, 2012) to a more friendly and cheaper approaches.

The development of e-learning may be attributed partly to distance education. Some universities implement e-learning as a strategy to boost their distance education programme (Liyanagunawardena, 2012; Beldarrain, 2006). Distance education historically spans back four centuries with its egalitarian approach to education when postal services were used to facilitate it (Casey, 2008) and lately, modern technologies (telecommunication, electronic devices and the Internet) have enabled students to receive instruction from some distant location. Modern technologies, being more robust, have made it possible for institutions to offer up to doctoral level courses completely or partly online (Beldarrain, 2006).

According to Casey (2008), in 1997, the California Virtual Campus opened with 15,000 classes for certificates and degree programmes. After 1999, the British Open University, expanded to offer postgraduate programmes to over 25,000 students. Casey's argument is that technologies mediate the necessary two-way communication between the students and their lecturers to enable a full range of university programmes to be delivered. The affordances that social collaborative technologies offer could help higher education institutions to deliver distance education in more effective ways (detailed discussion in section 2.5.2). As Liyanagunawardena et al. (2013, p.203) argues:

> Further developments of distance education have appeared with each new communication technology: radio, television, video recorders, home computing. The latest development, that of the Internet (including very recently the mobile Internet), has similarly been adopted by many existing higher education providers but has also supported the emergence of a new model dubbed a massive open online courses (MOOCs).

Liyanagunawardena et al. clearly show how advances in technologies have contributed to the development of e-learning. The advances in the modern ICTs created new opportunities for higher education institutions to facilitate their distance education programmes and has helped in changing the learning paradigm to what Williams and Goldberg (2005) refer to as "learner-centricity", whereby the lecturers are increasingly on the side-lines, not centre-stage. This

approach is in line with the concept of 'guide on the side' as opposed to 'sage on the stage'. The 'guide on the side' instructional approach is where a lecturer provides students with occasional advice, assistance, and correction while allowing them to explore a subject area independently or by interacting among themselves as in the case of the University of Arizona Libraries' online approach to database instruction (Rosenfeld et al., 2013).

On the other hand, the 'sage on the stage' is a method which makes students passive as the lecturer takes the centre stage. There is an increasing shift from 'sage on the stage' to 'guide on the side' that characterizes the changing role of lecturers (Morrison, 2014). Learning using the social collaborative technologies, allows the students to engage more through interaction and collaborations (Jucevičienė and Valinevičienė, 2015) hence making it possible for the 'guide on the side' approach.

According to Williams and Goldberg (2005), during the 1980s and 1990s, there was a significant growth in the number of students studying part-time and through distance learning. They suggest that because of e-learning, there has also been a dramatic growth in non-traditional students, the lifelong learners who required access to education. This can partly be attributed to the role played by modern technologies in providing access to students who mainly studied off campus.

According to Cantoni et al. (2004), e-learning enabled several 'only-virtual' universities like the British Open University and the Globewide Network Academy in Denmark to be created. Later, other leading higher education institutions joined to create distance-learning programmes which ran alongside regular on-campus programmes. For example, when The Massachusetts Institute of Technology (MIT) announced that by the end of April, 2001 it would create about two thousand online courses within a 10-year period, several courses were made freely available to everybody (Cantoni et al., 2004). Today, more than 80% of the institutions are offering online courses (Bichsel, 2013), and since 2008, massive open online courses (MOOCs) have been run by a variety of public and elite universities, especially in North America (Liyanagunawardena et al., 2013) although the success of MOOCs remains hotly contested by educational technology community especially due to the challenges with respect to data collection, identity resolution and analysis (Absar et al., 2016).

Although initially modern e-learning was mainly focused on facilitating the creation of virtual universities and strengthening distance-learning programmes (Cantoni et al., 2004) by leveraging the cross border learning opportunities offered by e-learning, today however, e-

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learning is considered as useful in enhancing the quality of teaching and learning (Bhuasiri et al., 2012) that has made it part of the traditional on-campus programmes in an approach which this thesis refers to as a blended approach (details in section 2.1.3) . It is an education delivery approach that supports and transforms the learning process and performance (Kahiigi Kigozi et al., 2008b), becoming a popular mode of delivering educational materials in higher education by most universities throughout the world.

More changes have taken place in higher education with the popularisation of Web 2.0 especially the social collaborative technologies, which unveiled new opportunities but with challenges as well (Bennett et al., 2012). Web 2.0, largely attributed to O'Reilly (2005), refers to the second stage of the Internet development. With the development of Web 2.0, the Internet became more friendly and characterized by greater user interactivity and collaboration (Selwyn, 2007). This is a shift from static Web pages, what Price (2006, p.2) refers to as "a set of linked Web pages that are largely information sources", to dynamic or user-generated content which can allow for flexibility in the learning processes and for easy creation, sharing and re-use (Lwoga, 2012). Students and lecturers can now, more than ever before, adopt more interactive and collaborative approaches to learning.

Bosch (2009) shows that there are potential positive benefits of social collaborative technologies, which have attracted many lecturers and students to take up these interactive and collaborative learning approach. What Bosch (2009, p.185) points out is that learning contents are "much more freely and instantaneously available to students who can download course notes and readings with a single mouse click" using platforms such as Facebook and share among them. Because a lot of online materials are available for students to share, the role of a lecture is crucial as students don't always know best. Torres-Diaz et al. (2015, p.129) argues that "the effect of using social tools inside of the learning environment changes the organization of the elements, the level of learning and the role of the lecturers". This means that in addition to making available learning content to students, lecturers have to guide appropriately in a SoCeL environment. However, such environment also helps the lecturers to teacher effectively.

As revealed by Conole and Culver (2010), in higher education, many lecturers are also using these technologies to directly support their teaching. They can engage with students directly or indirectly by supplying learning content and information, guiding students as well as interacting with them. The lecturers also use these tools for their own professional development (learning). These platforms provide the technological environment for them to

find, share and discuss with each other. As a learning tool, the technologies help them share their teaching ideas and designs and get feedback from peers.

The other benefits include: enjoyment and usefulness (Lin and Lu, 2011); therefore, they can facilitate their learning process. Nadkarni and Hofmann (2012) show that those who use these technologies fulfil their needs 'to belong' and 'self-presentation', which are important aspects of a student-centred learning in a personal learning environment, PLE (Dabbagh and Kitsantas, 2012). It can therefore be argued that students and lecturers use social collaborative technologies to enhance their learning experience and performance. Students and lecturers look to them to "mediate and enhance their instruction as well as promote active learning for their students" (Tess, 2013, p.A60).

This study explores the learning environment in which students and lecturers of two universities in Uganda are adopting these technologies for their educational needs. The next section explores the context of this research.

1.1.2 Research context

This research contextualises SoCeL as learning in an environment that involves integrated informal and formal learning scenarios with interactive and collaborative tools as detailed in Chapter 3. This is in line with PLE pedagogical approach (Dabbagh and Kitsantas, 2012) and community of practice (CoP) framework (Lave and Wenger, 1991). PLE is a potentially promising pedagogical approach for both integrating formal and informal learning using social collaborative technologies and supporting student self-regulated learning in higher education contexts (Dabbagh and Kitsantas, 2012), making it a suitable blended learning approach.

Social collaborative technologies can support the notion of CoP because of their features that support collaborative activities (Wang, 2012). They are capable of incorporating people from diverse background but intending to acquire the same knowledge to get together and share it to other people who might become newcomers (Tseng and Kuo, 2014). Lewis and Rush (2013) argue that the CoP notion is applicable in various learning contexts such as a group of students who interact with each other to share their experience and knowledge about some aspects of their learning. They jointly develop and learn about a shared repertoire of resources.

In higher education therefore, CoP may enhance interaction and collaboration among students and lecturers facilitated by the use of social collaborative technologies. Research

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(McLoughlin and Lee, 2010) has shown that the use of social collaborative technologies supports informal conversation, reflexive dialogue and collaborative content generation. This enables access to a wide raft of ideas and representations; making it easy for students to aggregate and share the results of learning achievements. When they participate in collaborative knowledge generation, they can manage their own meaning and further build it in a cooperative way (Dabbagh and Kitsantas, 2012).

Adopting social collaborative technologies in a way that supports PLE and CoP notions can facilitate effective integration of SoCeL in higher education. This is why this study explores the adoption of these technologies by students and lecturers. However, adoption of technologies in higher education is influenced by a number of factors as reported in several studies such as (Mukoko, 2013; Talukder, 2012; Mayoka and Kyeyune, 2012; Talukder and Quazi, 2011; Ssekakubo et al., 2011; Quazi and Talukder, 2011; Munguatosha et al., 2011; Vannoy and Palvia, 2010; Dupagne and Salwen, 2007), suggesting that, for effective integration of such technologies, it is essential to understand the factors that influence their adoption as discuss in section 2.7. It would also be important to understand the environment in which these technologies are adopted as discussed in section 2.6.

That is why this study explores learning environment and other factors influencing SoCeL adoption at university level within the context a developing country so as to identify the opportunities and challenges of integrating and managing the utilization of this emerging learning technology. A detailed conceptual framework is discussed in Chapter 3 and that includes the key concepts of informal learning, social networking, and learning management. SoCeL environment is formed as the three elements are combined.

1.1.3 Research focus

This study focuses on two aspects of e-learning: learning contexts (environment) and technology adoption. With e-learning becoming more commonplace in higher education, there is a documented need for environments that facilitate effective implementation and management of e-learning (Govindasamy, 2001).

In this study the approach taken to establish SoCeL environment addresses the contextual aspect of e-learning through integrating informal learning scenarios and activities within the formal learning design. This line of inquiry investigates how informal learning strategies can be integrated with formal educational programme.

The technology adoption aspect of e-learning that is addressed in this research involves the use of social collaborative technologies as instructional tools; this study investigated the adoption of social networking tools since they are more common and preferred by the participant as revealed in the preliminary survey. Social networking tools can either be adopted as integral part of LMS or as separate independent applications to support and transform the learning process (Dalsgaard, 2006).

The subjects of the study were the lecturers and the students of two universities in Uganda; the choice was a purposive selection based on the results of a previous study by (Kahiigi Kigozi et al., 2009). Further details about the selection of cases and participants are discussed in Chapter 4. Their participants' practices, perception and expectations were explored in order to validate the framework for SoCeL developed in this research and establish how to effectively integrate SoCeL within their educational practices. The study began with the premise that establishing a well-founded framework to guide the integration of these interactive and collaborative technologies for learning purposes is essential and requires exploratory and contextual approach.

1.1.4 Motivation and the purpose of the research

The emergence of social collaborative technologies in higher education has created new opportunities for interaction in learning process, attracting adoption by lecturers and students (Thompson et al., 2014; Prestridge, 2014; Mao, 2014), which has resulted into a shift in the learning paradigm from a top-down system to a networked approach (Balakrishnan, 2014), whereby lecturers or the knowledge is no longer the focus but rather students are the focus (Ward, 2012). The shift presents challenges which have attracted several studies in the recent years.

Although the adoption of social collaborative technologies in higher education could be a slow process considering the challenges that are experienced in different institutions, the recent NMC report (Freeman et al., 2016) points out a 'shift from students as consumers to creators' as one of the key trends accelerating technology adoption all over the world. This confirms the paradigm shift described by Balakrishnan (2014) as a top-down system to a networked approach of learning. This approach means that students use social collaborative technologies to learn by making and creating rather than from the simple consumption of content.

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As argued by some researchers (Corbeil and Corbeil, 2010; de-Marcos et al., 2016), purposeful integration of these technologies in education is necessary. This is because these tools were not designed purposely for educational use but for social interaction (boyd, 2006). From the literature reviewed, there seems to be lack of empirical evidence to show institutional and formal integration of social collaborative technologies into higher education within the context of this study.

The existing research on the utility and effectiveness of these technologies in the higher education system remain limited, and without evidence to show clearly that social collaborative technologies have improved learning in higher education (Tess, 2013). Frameworks to guide integration may be essential in ensuring successful adoption of such technologies. As part of e-learning evolution, this study seeks to propose an integration framework for effective adoption of SoCeL in higher education system. Previous study (Li, 2007) tends to advocate for the design of learning activities to be cognisant of the functionality of social collaborative technologies so that purposeful adoption may be successful.

1.1.5 Problem statement

The increasing use of social collaborative technologies in higher education demonstrates the popularity of Web 2.0 applications among students and lecturers. As suggested by Tess (2013), this trend may be attributed to the ubiquity of social collaborative technologies; they have transformed the ways students and lecturers communicate, collaborate, and learn (Conole and Alevizou, 2010). Although this trend has become commonplace, there has been little work investigating how students and lecturers use or respond to these technologies for formal education needs (Balakrishnan, 2014). The NMC report (Freeman et al., 2016) suggests that social collaborative technologies are ubiquitous in the sense that their adoption in higher education is some of the key trends all over the world. However, the ubiquity of social collaborative technologies alone does not warrant their consideration as educational tools after all, they were not designed with educational purpose in mind but for social interaction.

This is why previous studies (such as Corbeil and Corbeil, 2010; de-Marcos et al., 2016), have argued that purposeful integration of these technologies in education is necessary. Purposeful integration may require investigation to establish what determinants are priorities when making decisions about integrating social collaborative technologies into

the higher educational system (Tess, 2013). According to Balakrishnan (2014), it is important to investigate how SoCeL can improve teaching and learning experiences by allowing interaction and collaboration among peers and between students and lecturers.

Because the literature, as highlighted above, suggests there is lack of empirical evidence to show successful integration of social collaborative technologies into higher education, in this thesis a conceptual framework for SoCeL is developed to guide the integration of social collaborative technologies in higher education. Using this framework, two aspects of SoCeL implementation are explored in the context of two universities in Uganda: the learning environment and technology adoption.

The learning environment addresses the contextual and practical issues regarding learning modes, affordances, and choice of social collaborative technologies. Technology adoption address determining factors for adopting social collaborative technologies whilst examining participants' behaviours, perceptions, experiences and expectations on the use of these technologies.

1.2 Definitions of key concepts

Three concepts are used in this thesis to explain SoCeL: Informal learning, social networking, and learning management (Figure 1.1). These three concepts represent characteristics of SoCeL environment, which is created in line with the principles of PLE (Van Harmelen, 2006) and CoP (Wenger, 1998).

C1: Informal Learning

C2: Social Networking

C3: Learning Management

C1-2: Educational Affordances of Social Networking
C2-3: Management of Educational Collaborations
C1-3: Management of Informal Interactions

Social Collaborative E-learning
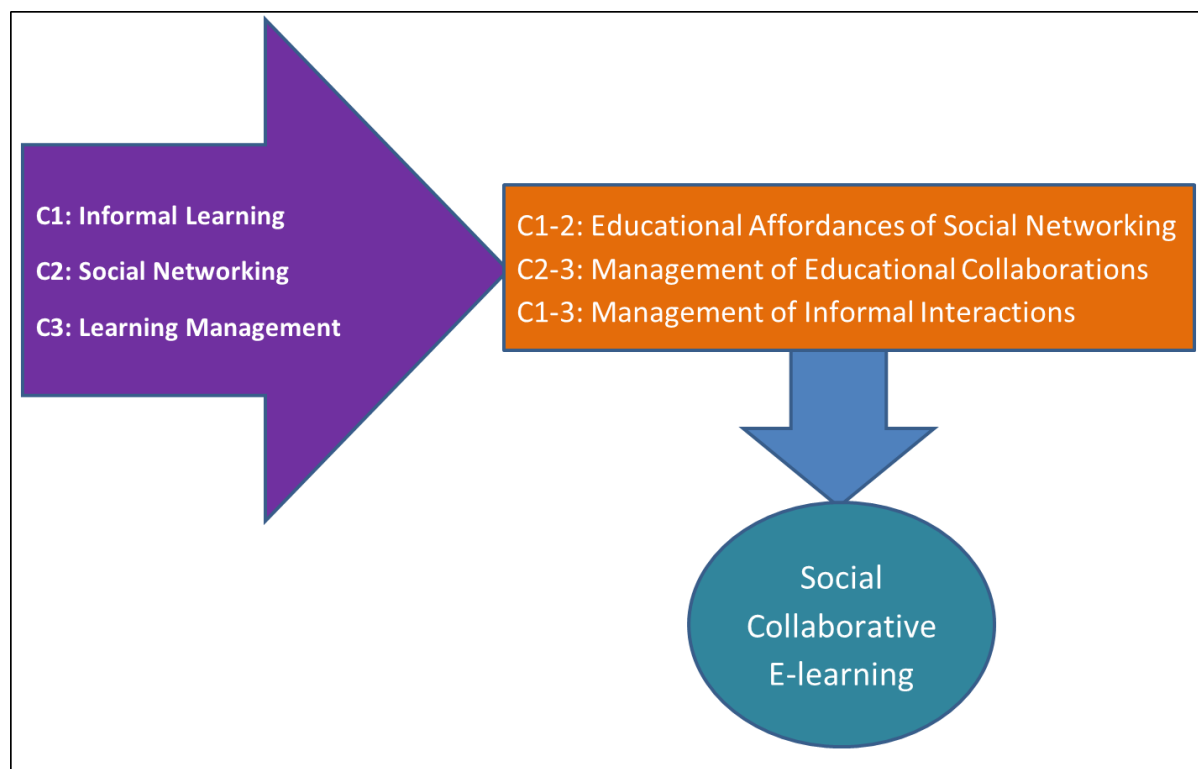
Figure 1.1 Definition of key concepts

From Figure 1.1, the terms (C1-2, C2-3 and C1-3) are used to highlight the areas of focus of this research and they have been explained in sections 2.5.1, 2.5.2 and 2.5.3. The following sections 1.2.1 to 1.2.4 explain the four key concepts: SoCeL, informal learning, social networking and learning management, also depicted in this figure.

1.2.1 Social collaborative e-learning

Social collaborative e-learning (SoCeL) is used in this thesis to refer to the e-learning approach involving the use of social collaborative technologies such as Facebook and Twitter to support interactive and collaborative learning environments characterised by informal interactions, educational collaborations, and social networking. Therefore, SoCeL environments are created in line with PLE and CoP.

PLEs recognise the importance of informal learning (Martindale and Dowdy, 2010) in that students' e-learning system should be under their control and to enable them perform learning activities asynchronously as well, for example, via mobile device with Internet connection (Van Harmelen, 2006). This therefore, provides a way in which students can take upon themselves some of the functions traditionally managed by the lecturer or institution (Liber and Johnson, 2008) for example, by using social networking tools to initiate

engagement among peers (Dabbagh and Kitsantas, 2012). However, the role of the lecturer is essentially setting up activities and sub-activities at different levels of granularity and assigning those activities, resources and tasks to students (Van Harmelen, 2006).

The CoP concept was used by Wenger (1998) to mean groups of individuals working together (cooperatively) to share a concern or a passion for something they do and learn how to do it better as they interact regularly. This can be a group of people who do not even know each other but have common interests whereby members can engage in joint activities. This can be: discussions, helping each other, or sharing information to promote what Stamps (1997) earlier described as 'social learning'.

The concept was later extended to 'community e-learning' and used by Cook and Smith (2004) to provide a better understanding of the social context of online communities and issues around the creation and exchange of knowledge within and between online communities which are often facilitated by social networking tools and to which students and lecturers belong.

Therefore, in higher education, the concepts of PLE and CoP are useful to describe learning practices for both students and lecturers beyond the formal constraints. For example, where students form a network in which they learn from each other based on the idea of 'community of learners' (Rogoff, 1994). Another example is where lecturers form network for them to share professional experiences like in the case studied by Lewis and Rush (2013) in which Twitter-based communities of practice were used in higher education. In this case, university lecturers used Twitter to increase their knowledge and experience of using social collaborative technologies for educational purposes. From what these studies reveal, it is clear that CoP is an essential practice of learning which can be used to establish SoCeL.

For a SoCeL environment to meet the requirements of PLE and CoP, three concepts have been used as demonstrated in Figure 1.1 and treated in this thesis as essential elements of SoCeL. In the following sections, definitions of these elements are presented; they were adopted in this thesis based on the views from literature.

1.2.2 Informal learning

Informal learning has drawn the attention of many policy makers, educators and researchers in higher education sector and there is an increasing amount of efforts to recognise it not only as the alternative access route in the higher education but as strategy for achieving formal

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educational goals by blending it with formal learning (Ainsworth and Eaton, 2010; Johnson et al., 2015; Malcolm et al., 2003b; Mott, 2010). Informal learning goes beyond institutional context and it occurs as people actively participate in creation and exchange of knowledge for example, within and between (in this case) online community centres in what is referred by Cook and Smith (2004) as informal community e-learning.

Different authors define the concept of informal learning in different ways. According to Meyers et al. (2013), informal learning occurs outside the school-based context, often in such contexts as "libraries, museums, social groups, affinity spaces online, not to mention the home environment". This definition places emphasis on the venue where learning takes place in the sense that the authors argue that informal venues of learning and development are important spaces where knowledge or skill is both employed and cultivated. Therefore, they suggest that informal contexts exist outside of school although they stress that this is not strictly about the physical location of school so much as the pedagogical practices that demarcate formal learning from informal places where people are exposed to informal learning environments: the home, libraries, museums, zoos and aquariums, clubs, sports teams and online communities (Meyers et al., 2013).

On the other hand, Livingstone (1999) defines informal learning as an activity involving the pursuit of understanding, knowledge or skill which occurs outside the curricula of educational institutions, or the courses or workshops offered by educational or social agencies. What this means is that informal learning includes any form of learning that takes place outside the curriculum of formal and non-formal educational institutions and programmes (Schugurensky, 2000). The distinction of learning modes into three: formal, non-formal, and informal, confirms Eraut's (2000) view which tends to place these three learning mode concepts in some kind of hierarchy, having informal learning at the far end of this hierarchy.

According to Eraut (2000), informal learning is often treated as a residual category to describe any kind of learning which does not take place within, or follow from, a formally organised learning programme or event. In other words, the category of informal learning includes what does not occur either in formal or non-formal context. But because of its usage in other situations dress, discourse, behaviour, diminution of social differences renders the concept of informal marginal and therefore 'non-formal' learning is better suited in describing the learning that occurs outside the formal context. Informal learning may be defined by what is not formal as argued by Colley et al. (2002). After all, there is a huge

amount of writing about how non-formal and informal learning cannot be easily or clearly separated.

Ainsworth and Eaton (2010) defines informal learning in terms of curriculum to refer to it as being a type of learning which is not organised, "rather than being guided by a rigid curriculum and often thought of as experiential learning". However, it is an important learning that can help someone to understand the world better "from a new perspective and with innovative skills". It should also be noted that experiential learn can also happen in the classroom.

From the definitions above, it can be argued that informal learning in not structured and not limited to 'school' or curriculum but it is an essential process that helps one to become more knowledgeable or skilful. This thesis adopts the definition given by Ainsworth and Eaton (2010) since it places the learner at the centre of learning sphere. This is important because it signifies that informal learning may occur spontaneously all the time and is likely to be the first learning a person experiences as a baby who is often guided by the parents and others around.

This means that in the higher education context, informal learning may involve learning outside the class curriculum and it facilitated by the use of social collaborative technologies. Social collaborative technologies make it possible to create PLEs and CoPs in which there can be interactive and collaborative learning activities.

1.2.3 Social networking

Albrechtslund (2008) regards social networking as a practice based on participatory surveillance as it is possible to trace one's geographic location, trails of friendships, etc., making it a mixed world practice, comprising of the virtual world and the physical world. This argument stems from his observation that characteristic of the online social networking is the sharing of activities, preferences, beliefs, etc. to socialize and that one this practice tends to becomes "a participatory approach to surveillance, which can empower – and not necessarily violate – the user", although he argues that this might possibly have negative consequences in terms of 'life after social networking'. The 'life after social networking' results from the fact that the 'public' of wider audiences may have access to one's 'social networking information and information could be referred to later in life. This situation is due

to what boyd (2010) refers to as 'networked publics' and normally results to enormous privacy and security issues (Otto et al., 2016).

According to boyd, 'networked publics' are publics that are restructured by networked technologies. As such, they are simultaneously (a) the space constructed through networked technologies and (b) the imagined collective that emerges as a result of the intersection of people, technology, and practice, which is what the SoCeL model is about. Social networking therefore can be seen as a practice that enables people to interact and collaborate within the space constructed by social collaborative technologies. Whilst in the networked public, one can establish or expand contacts, by making connections and through other individuals who are members of that network.

In higher education, social networking is praised for its potential to engage students with their studies (Jucevičienė and Valinevičienė, 2015), although there are fears that such practices compromise and disrupt students' engagement with the "traditional" education concept (Njenga and Fourie, 2010). Many universities students and lecturers use the social networking tools (Hamade, 2013; Falahah and Rosmala, 2012) and this trend is fast growing with Facebook being the most popular networking tool (Jucevičienė and Valinevičienė, 2015).

1.2.4 Learning management

In order to understand the concept of learning management and how it is applied to SoCeL, it is essential to discuss Learning Management Systems (LMS) and their functionalities. In this thesis, the concept learning management is used to extend the functionality of LMS to the SoCeL approach. The term LMS is used to describe a number of different computer applications that handle e-learning (Watson and Watson, 2007). Different authors give different definitions to LMS, some of which are discussed in this section. For example, Szabo and Flesher (2002) define LMS as the "infrastructure that delivers and manages instructional content, identifies and assesses individual and organizational learning or training goals, tracks the progress towards meeting those goals, and collects and presents data for supervising the learning process of an organization as a whole".

These functionalities make some authors think about LMS in terms of 'disempowerment' for instance, Sclater (2008) considers LMS as a software application designed for the purpose of "managing and controlling the activities of the student by the university". In other words, by managing the delivery of e-learning, university allows

lecturers to control what the student learns through uploading learning materials and managing the record of students and learning activities (Watson and Watson, 2007). However, some authors argue that the control that is facilitated by LMS is due to the nature of the first generation of the Web (Web 1.0), which restricted what the students would do with the learning materials (Poore, 2013; Cantoni et al., 2004). With the evolution of Web 2.0 (O'Reilly and Battelle, 2009), students have more 'power' over what they learn and their activities, which have resulted from attempts to integrate the traditional LMS with Web 2.0 technologies (Hori et al., 2015; Conde et al., 2014; Du et al., 2012; Chisanu et al., 2012).

Because of the shift from the traditional environment provided by LMS to a constructivist learning environment, thanks to Web 2.0, this thesis argues that there is need to focus on learning management other than the LMS. This is motivated by the argument that in a SoCeL environment where PLE and CoP are emphasized, management learning goes beyond the scope of LMS. For example, where there is use of social networking tools, using learning analytics is essential since there is massively multi-user virtual environments and courses involved (Lee et al., 2016). Learning analytics such as 'Connected Learning Analytics (CLA)' enable data to be extracted from social networking tools and imported into a 'Learning Record Store (LRS)', as defined by application programming interface (API) standard for management and reporting purposes.

Therefore, learning management in this thesis refers to capacity to manage learning processes within the SoCeL environment. This functionality could enable the lecturer to have better view about how students interact with the learning contents or with other people and resources within the SoCeL environment without necessarily controlling the activities of the students. However, this is not to say all aspects of informal learning will be managed formally as peer-to-peer private networks continue to be dominant.

1.3 Research aim, objectives and the questions

The main aim of this study was to design a framework for SoCeL and validate the requirements for its adoption using the experiences of students and lecturers in two universities in Uganda.

The main research question is

How can social collaborative e-learning be effectively integrated in higher education?

1. INTRODUCTION

Although this question is exploratory in nature, the approach adopted is mixed method and therefore combining both exploratory and explanatory sub questions to help attain the objectives set below (see details in 4.2):

Emergent research questions:

Due to the nature of the research methods adopted in this research as discussed in Chapter 4 , some of the questions answered by the research emerged during the process. The initial questions and case selection are discussed in section 4.2.3. The questions followed the design of the conceptual framework whereby the focus was in the three key areas of informal learning, social networking and learning management. During the research the questions that emerged focused more on the environment and the adoption of social collaborative technologies. The emergent research questions were:

1. What are the key learning concepts and theories that can be used to conceptualise SoCeL?

2. What are the perceptions, and practices of students and lecturers regarding the use of social collaborative technologies and how do these influence the learning environment?

3. What factors determine the adoption of SoCeL by students and lecturers and how are they significant in influencing the actual use of social collaborative technologies?

4. How can social collaborative technologies be effectively used for learning?

Objectives:

1. Design a conceptual framework for SoCeL

2. Investigate the contextual environment under which SoCeL is possible

3. Validate the requirements for adoption of SoCeL by students and lecturers

4. Propose frameworks for integrated environment and adoption strategy for SoCeL

1.4 Structure of the thesis

The rest of the thesis is organised as follows:

Chapter 2 is the literature review, examining the current state of art and a range of topics related to SoCeL. The aim of this chapter is to identify the gap, inform the choice, and validate the approach of e-learning implementation in higher education. It provides a review

on delivery methods, e-learning implementation in higher education, interactive and collaborative e-learning as well as technology adoption challenges.

Chapter 3 presents the conceptual framework for SoCeL. In this chapter, all the key terms and concepts used to define SoCeL are fully discussed whilst providing the perspective of this study and how SoCeL should be understood. Definitions and theoretical analyses have been presented here along with basis for research questions. Learning theories such as social constructivism, connectivism, and social cognitivism have also been presented in this chapter.

Chapter 4 gives details to the research approach and methods adopted. The research methodology chapter introduces the research philosophical perspective in terms of Ontological assumption and Epistemological viewpoint before highlighting the research type and methods adopted. A detailed review of the selected methods has been presented before discussing the considerations for data collection, analysis and interpretation.

Chapter 5 is a results section concentrating on the learning environment. The findings of the study relating to the learning materials, instructional methods, and the learning contexts (including social, technological, and pedagogical contexts) have been presented and discussed here. This chapter also provides the SoCeL contextual model to inform the development of the framework for learning environment design.

Chapter 6 is another results chapter concentrating on the adoption of SoCeL. The discussion in this chapter is based on the theoretical background to technology adoption. The technology adoption model (TAM) is the main theory used to validate the findings of this research in respect to adoption.

Chapter 7 is also a results section. It focuses on integration of SoCeL based on analysis of the key findings from the previous results chapters. The aim is to provide an analysis of what makes SoCeL effective model whilst explaining how to provide effective SoCeL environment and its adoption strategy. Two integration frameworks for SoCeL were proposed in this chapter.

Finally, **Chapter 8** concludes the thesis providing a summary of the research, findings and recommendations. It pulls out the contributions of the research to the body of knowledge, highlighting the areas of contributions and the publications made during this study. Limitations and suggestions for further research have also been made in this concluding chapter.

Chapter 2

Literature Review

This chapter provides a review of relevant literature in order to: put into context the key concepts, explore the theoretical background, and establish the knowledge gap which this study sought to fill. The concepts defined here fall into two groups. The first group of concepts, from section 2.1 to section 2.4, relate to the context of the research area, into which the topic is situated. The second group of concepts, from section 2.5.1 to section 2.5.3, relate to the research focus and direction. They define the boundaries covered by the research questions and provide the foundation for the contribution of this research to the body of knowledge.

From 2.5 to 2.10, a theoretical background is explored to support this study and give a firm grounding for discussing the results, which are presented in the later chapters. A summary of the review is presented in 2.11 in which the conclusion is drawn and significance of the study also provided.

2.1 Learning delivery approaches

There are several approaches adopted by different higher education institutions in Uganda to deliver education to their students. These include the use of: traditional face-to-face (Basaza et al., 2010; Kituyi and Tusubira, 2013), e-learning (Kituyi and Tusubira, 2013) and blended approach (Tshabalala and Ndeya-Ndereya, 2015; Kintu and Zhu, 2016).

Most universities around the world, have been offering a number of face-to-face courses for students to choose from (Pillay and Alexander, 2015; Artino, 2010; Tejeda-Delgado et al., 2011). In Uganda the face-to-face still remains a default approach because it is a traditional approach to teaching and learning, which is familiar the students and the lecturers. Another reason is that adopting alternative approaches still meets a lot of challenges (Oroma et al., 2013; Kasse and Balunywa, 2013; Zhu and Justice Mugenyi, 2015; Mayoka and Kyeyune, 2012). As such, it is used for regular (campus-based) programmes and as a

component for the distance learning programme. Most programmes are offered as fulltime and delivered mainly through the (default) face-to-face approach. However, there are a number of distance learning programmes (offered as part time), where face-to-face is only partly used. As such, it can be either on the main university campus or the lecturer can travel to rural areas to meet with students who are on distance learning programme (Basaza et al., 2010). However, some students find it challenging to take the face-to-face courses due to limitations such as distance, timetabling, professional obligations, or family responsibilities (Bourelle et al., 2016; van Schaik et al., 2003).

Others are motivated by such factors as quality and flexibility (Sun et al., 2008) so they prefer e-learning courses. Meanwhile, in some cases, students prefer a blended learning approach (Alebaikan and Troudi, 2010). Therefore, in order to meet to the demands of students whose backgrounds and interests vary, institutions of higher learning are encouraged to offer their courses of study using a variety of delivery approaches (Lubega, 2014; Lakhal and Khechine, 2016). However, institutions do often operate under some constraints that hinder them from providing a flexible range of offers especially for online or blended learning. Higher education institutions in Uganda, like elsewhere in the developing world, experience challenges unique from developed countries. Most of the institutional challenges as highlighted by (Kasse and Balunywa, 2013) include limited bandwidth, lack of financial resources, inadequate human resource capacity and limited electricity. Despite these challenges a paradigm shift is being witnessed in most institutions throughout the world. However, it is also in the interest of the institutions to provide a variety of approaches so as to draw students from various backgrounds and satisfy students demands, which are increasing changing due to the influence of technologies.

Johnson et al. (2014) predicted that over the last two years, there would be a trend in higher education; a trend characterised with paradigm shift to include more online learning and blended approaches. This was confirmed by Anderson et al. (2016, p.132); adding that "offering students options in delivery modes increases the likelihood of student success, allowing them to find a way out of and therefore escape the 'perfect storm' that higher education finds itself in today". The study by Anderson et al. (2016) shows also that in the USA for example, students are looking for time flexibility in course scheduling and structure and clarity in course content and its delivery.

The following sections present the three course delivery approaches which have been explored in this study. This is to examine the meaning accorded to these approaches by other authors and what these mean for this research, that is, how they have been used in this study.

2.1.1 Face-to-face learning

The traditional face-to-face learning has different definitions, depending on the author; Schorr and McGriff (2012), for example, define face-to-face learning as education delivered in a specific place – the 'school'. Schorr and McGriff's definition emphasizes the physical space, the school or classroom as where learning as opposed to a mediated environment (Bourelle et al., 2016). This method of learning is associated to the conventional, campus-based mechanism; contrasting it with distance learning in which the students associated with a given course rarely meet each other or their lecturers in a physical (face-to-face) situation.

This definition also emphasises the physical interaction between the students and the lecturer. Keller and Suzuki (2004) later endorsed the definition whilst they put emphasis on interactivity and elimination of isolation during the learning process. They acknowledged that face-to-face approach supports richness of case study and project styles of teaching since these require collaboration. Although these definitions highlight the advantage of physical or face-to-face contact, learning using this approach has always been restrained by the limitations of time and location (Alnabelsi et al., 2015). Before discussing the advantages and limitation of this learning approach, a definition adopted in this thesis is given.

In this thesis, the concept of face-to-face learning approach is used to refer to the situation in which the lecturer and the students meet in the same place and at the same time in order for the learning experience to be delivered. The traditional face-to-face approach such as a lecture method still remains among the most common teaching-learning method within most higher education institutions (Kharb et al., 2013) especially in situations where the interaction goes beyond the mere delivery of learning materials (Paechter and Maier, 2010). In some cases, being the only available option, which is familiar to both lecturer and student, also requiring no technological infrastructure, face-to-face becomes the default approach. This is especially where the institution is constrained in providing alternative options (Kasse and Balunywa, 2013; Andersson, 2008; Sife et al., 2007).

2. LITERATURE REVIEW

Classroom learning in higher education typically occurs in a lecturer-directed instructional context with face-to-face interaction in a live synchronous environment (Wu et al., 2010). Although the main element of face-to-face learning environment is oral discussion, this is no longer a technology-free environment (Paechter and Maier, 2010) and in many cases, digital technologies in various formats, such as, computers, smartboards and projectors are being adopted in several face-to-face learning environments to supplement education without necessarily making them online environments.

There are several advantages of the face-to-face method, which some studies (such as Johnson et al., 2000; Zhang et al., 2004; Castle and McGuire, 2010) suggest are responsible for making students more satisfied in comparison with online learning environment. The following are highlights of some of the advantages of the face-to-face learning method:

a) Physical interaction: The physical classroom is at the centre of this method and it enables the verbal and non-verbal communication mechanism. For instance when a student interacts with the lecturer a combination of both verbal and non-verbal expression enriches the communication (Paechter and Maier, 2010). This traditional learning approach provides a physical environment – creating an atmosphere and a sense of belonging largely defined by the physicality of the learning environment.

b) Immediate feedback: Students can communicate and gain immediate feedback from the lecturer and classmates in the classroom environment in which verbal communication is the mode interaction (So and Brush, 2008). This may make the face-to-face environment more convenience for them in terms of place or time.

c) Leadership and control: In a traditional university classroom setting where the face-to-face approach is used, there is more sense of leadership and control from the lecturer. The traditional face-to-face classroom, learning centres on the lecturer who can have control over class content and learning activities (Zhang et al., 2004).

d) Community: The sense of 'community' is more pronounced in the face-to-face classroom setting since all those involved in the class attend at same time and date which eases leadership and control by the lecturer (Paechter and Maier, 2010).

e) Motivation: Zhang et al. (2004) argue that the face-to-face approach increases student's motivation although it should be noted that this is subjective and depends on the lecturer. According to Zhang et al. (2004), unlike in 'only text-based' online environments, which may lead to boredom and disengagement in students, the face-to-face approach interests and motivates students to learn more; enabling them to gain a

good understanding of a topic. But in cases where the lecture is boring, the face-to-face approach will still be a boring session just like having inadequately equipped e-learning systems, which according to Zhang et al. (2004), can result in frustration, confusion, and reduced student interest.

The face-to-face approach is not uncontested. Despite the above advantages, the following are some of the disadvantages mentioned in literature:

a) Time limitation: in most cases, oral discussions occur and are normally completed during the lesson; they are normally within a set time frame and participation may be limited by time. Therefore, conversations are less likely to be reshaped during the set timeframe; making time a limiting factor (Wilson and Whitelock, 1998).

b) Unrecorded interaction: During such oral discussions, no permanent record of feedback is kept unlike in online learning environments (Wilson and Whitelock, 1998).

c) Passive learning: Face-to-face learning environments have also been criticised for encouraging passive learning (Johnson et al., 2000). Being a lecturer-led method, this approach tends to give the lecturer more controls on the what students should learn (Zhang et al., 2004). This tends to ignore the individual differences and needs of the students (Johnson et al., 2000). Others argue that this traditional method of learning does not pay attention to problem solving, critical thinking, or other higher order thinking skills because of that control (Banathy, 1994a; Banathy, 1994b).

2.1.2 e-Learning

Before the latest development of the Internet (including recently the mobile Internet), communication technologies such as radio, television, video recorders, home computing were used to facilitate distance education (Liyanagunawardena et al., 2013). "Technology has become an integral part of higher education learning" (Okello-Obura, 2010, p.98) despite the challenges that account for the low adoption rates, abandonment and failure of some e-learning projects (Zhu and Justice Mugenyi, 2015). There has a dramatic change in the way in which information is provided to the university community. For instance, in the past decade, Makerere University embarked on the electronic provision of information to facilitate study programmes and research. The integration of online information services such as online journal, electronic books, electronic document delivery services and digital libraries in its library systems allowed the students and the lecturers to access and utilise the electronic resources (Okello-Obura, 2010).

2. LITERATURE REVIEW

More importantly, today however, there are many social collaborative technologies including Facebook (Camus et al., 2016; Cabral et al., 2016; Belnap, 2016b; Phillips et al., 2015; Kirschner, 2015) and Twitter (Gonzalez and Gadbury-Amyot, 2016; West et al., 2015; Prestridge, 2014; Lewis and Rush, 2013; Fox, 2013; Kassens-Noor, 2012) that are available to the lecturers and the students, making access and utilisation of the electronic resources more flexible. They use these technologies in facilitating and enhancing their learning. The developments in the modern ICTs contributed to the evolution of e-learning and the global trend of e-learning adoption in higher education (Pathak, 2016; Mozhaeva et al., 2014; Kotsilieris and Dimopoulou, 2014; Gaebel et al., 2014; Bichsel, 2013).

e-Learning is now a global phenomenon and it has been so over the last two decades (Tuul et al., 2016). It is increasing considered as an essential part of the student learning experience in higher education throughout the world (Ellis et al., 2009). Not all aspects of e-learning are achievable in some countries at a full scale. In Uganda, like other developing countries, e-learning is still at its infancy with top universities still having adopted e-learning only on a small scale and mostly for delivering learning materials (Kasse and Balunywa, 2013). Although e-learning is a commonly used concept, it has been defined in different ways.

According to Pathak (2016), e-learning remains a broad concept used to describe instructional content or learning experience delivered or enabled by electronic technologies such as Internet, intranet/extranet, audio and videotape, satellite broadcast interactive TV and CD Rom. This definition seems to stress both the content and the means of communication.

On the other hand, Tuul et al. (2016, p.2) considers e-learning to be "a cost-effective method of delivering higher education", being an environment in which electronic media are used as a component of an instructional delivery system. Kahiigi et al. (2007) argued that e-learning approach involves the use of any ICTs to support and transform learning. This definition places emphasis on fundamental change that this approach brings in education. As viewed by Siritongthaworn et al. (2006), e-learning is an innovative approach to learning delivery via electronic forms of information that enhance the student's knowledge, skills, or other performance. This issue of performance enhancement is highlighted in this definition.

In this thesis e-learning is used to refer to the method of learning delivery which involves the use of technology as the primary resource to support, enhance and transform learning. These means may include, computer based and mobile based technologies, not

restricted to the Internet. Therefore, it is not enough to talk about technology but what quality it brings into the learning process.

e-Learning can be implemented purely online, where the entire course curriculum is delivered through the Internet, or using a blended approach in which part of the course curriculum is delivered online and part of it is delivered through face-to-face. For example, a recent study on European higher education institutions reported that although all higher education institutions that were sampled have embraced e-learning, most of them (91%) are using it as a blended learning approach by integrating e-learning into conventional teaching, and 82% of these institutions offer some courses in a purely online learning approach (Gaebel et al., 2014). The next sections explain what forms of e-learning are commonly used in higher education.

2.1.2.1 Online learning

Online learning has grown dramatically (Kim and Bonk, 2006) and over the past few years, it has become an integral part of most of the higher education institutions' overall strategy (Bowers and Kumar, 2015). Some studies (such as Kenny, 2002; Swan et al., 2014; Cuéllar et al., 2011; Siritongthaworn et al., 2006) suggest that the development of the Internet has created new opportunities for education as a teaching tool and for marketing purposes as well. It is argued that online learning has entered a new phase as a tool for enhancement of education quality, but not only as a facilitation of distance education (Bhuasiri et al., 2012). Many universities in Africa, like the rest of the world have adopted the Internet tools for official (marketing and educational) use (Otto and Williams, 2014a).

Initially the Internet facilitated the creation of several virtual universities such as The African Virtual University (AVU), The Western Governors University in the United States, and The Virtual University of the Upper Rhine Valley (Bodendorf and Swain, 2001; Cantoni et al., 2004; Farrell, 1999). Later, some other world's institutions joined in with an effort to strengthen their distance-learning programmes (Cantoni et al., 2004) by leveraging the cross border learning opportunities offered by e-learning. e-Learning is now considered as a useful tool for enhancing the quality of teaching and learning (Bhuasiri et al., 2012) as well as extending free mass education through Massive Open Online Courses (MOOCs) although it is also argued that MOOCs serve both education and marketing purposes.

In contrast to the face-to-face approach, Online learning promotes student-directed learning, offering the possibilities for digital interaction and multimedia learning material delivery (Wu et al., 2010). According to Swan et al. (2014), the number of institutions of

higher education offering online courses continues to grow. This growth is triggered mainly by the increase in numbers of non-traditional students who desire flexibility in scheduling, geographical location, access to courses (Bichsel, 2013).

Another reason is the ability for students to have control over what is learnt and how it is learnt (Zhang et al., 2004) although this does not invalidate the role of deadlines that students are normally given. Students are more in control when learning materials are delivered online especially with the social networking platforms as they can have personal content and organisation of the learning material as opposed to face-to-face in which the lecturer has more control of the learning process (Zhang et al., 2004). It should also be noted that the control is still largely limited on the LMS where the lecturer/course administrator retains the control. With the continued developments in the area of technologies such as the use of social networking tools, there has been a proliferation of learning materials being globally transmitted and accessed by (virtual) lecturers and students who hardly meet physically, hence making teaching and learning more Internet-based (Anderson, 2008) and not limited by distance or time (Jahan and Ahmed, 2012; Hung and Yuen, 2010).

As argued by Summers et al. (2005), Internet-based learning is emerging as a viable alternative to face-to-face learning for many higher education institutions which offer distance learning (mainly through online learning). This has resulted to wide adoption of the Internet within higher education to facilitate and enhance the process of learning for on-campus programmes as well (Levenberg and Caspi, 2010).

Previous theoretical and empirical studies have shown the importance of an online learning environment especially in moulding positive attitudes among students toward learning (Pillay and Alexander, 2015). This could be because online courses are largely considered to motivate students, especially the slow learners so they develop positive attitude as they interact more with the course materials.

Generally, the purpose of using an online learning approach is to serve students who find it challenging to attend face-to-face classrooms including special needs students (Summers et al., 2005), reducing or eliminating the travel time of students and lecturers. An online class delivers course content through the Internet whereby students and lecturers interact through text-on-screen communication, video, voice, games, simulations, or conferencing and the learning environment is independent of a location and time. Some online course contents can be delivered through audio and video streams, which may be embedded in the courseware.

2. LITERATURE REVIEW

Although previous studies have shown no statistically significant difference in learning outcomes between the traditional face-to-face and online learning methods (Levenberg and Caspi, 2010), there are some arguments in support of adopting online learning environment. For instance, Haythornthwaite and Andrews (2007) argue that the use of computer systems and new networking technologies are revolutionizing the way we understand learning and education especially in addressing the time and distance limitation.

An online learning environment enables students who are unable to meet the time and space constraints to access the courseware, making it student-centred and self-paced learning, enabling students from "a variety of backgrounds to access educational opportunity, allowing for vast dissemination of education" (Castle and McGuire, 2010) to global audience. Increasingly, the Internet is now being used to facilitate distance education (van Schaik et al., 2003) in support for reaching global audiences.

The Internet provides mechanisms for transmitting and accessing learning materials to the global audience, making it cost-effective for students who do not need to travel so they can study over the Internet. Since the methods employed in online learning are generally known to be much lower in carbon intensity (Castle and McGuire, 2010), there is additional operational benefit added to online learning in terms of environmental impact.

Students using the Internet have access to knowledge from different sources, and so can formally and informally learn from online materials. This however, calls for guidance from the lecturers as students may access knowledge from wrong sources and usually encounter information overload (Koroleva et al., 2010) that may require effective way to deal with. They reuse and share their knowledge using interactive Internet tools such as social networking sites (Okada, 2012). Being an infrastructure for the distribution of online learning materials, the Internet also offers a mechanism for electronic communication between students, lecturers and other users so as to promote the culture of interaction and participation, thereby motivating and enhancing learning (Violante and Vezzetti, 2015; Alenezi and Shahi, 2015).

Tuul et al. (2016) argues that online initiatives can be a cost-effective method of delivering higher education and the institutions also benefit from having reduced cost of providing residences and other facilities required for students to undertake campus-based face-to-face courses. This and other arguments such as wider catchment area for enrolment that comes a variety of student backgrounds demonstrate that online learning is for the benefit of both students and institutions.

2. LITERATURE REVIEW

Although some authors (such as Wu et al., 2010; Summers et al., 2005) view online learning with optimism, others (Resnick, 2002; Brabazon, 2012; Bone and McNichol, 2014) have scepticism over it especially on the issue of quality. When computers, like the previous technology devices, were first introduced in the classroom, there was no clear suggestion that they could significantly improve the quality of teaching and learning.

Resnick (2002) supported this argument adding that if computers are simply used to deliver information to students, or simply to reinforce outmoded approaches to learning, the revolutionary potential of this new technology for transforming learning and education would be missed. Another argument was that technology would simply distract students from learning things which are more essential in life (Brabazon, 2012).

What these authors seem to suggest is that how technologies are used to facilitate online learning, determines whether quality learning happens. Producing quality resources still remain a major challenge for any institution wishing to provide more flexible and quality online courses (Bone and McNichol, 2014). Institutions seem to recognise the differences in online learning although there are challenges hindering full adoption (Anderson et al., 2016). Because online environments enable the global reach of education, there is likely to be an affinity to commercialize education. This can potentially lower the quality although with competition although generally it can be argued that the quality improves in an online learning environment.

Another challenge with the online approach is that it requires self-discipline especially on the student's part (Tarmizi et al., 2015). Online communication, especially text based, requires much writing, which can be demanding. The text-based online environment allows the lecturer to deliver the content, but students themselves must take greater initiative to access these materials, learn, and understand them and then make written communication to demonstrate what is learnt. During the process of learning, students are largely supposed to actively seek support (normally through written communication) unlike in the face-to-face where the lecturer may easily identify the student in need of assistance (and normally verbally assisted).

In Uganda there is an appreciation of the value of online education although the challenges related to change management hinder adoption and integration efforts. Kituyi and Tusubira (2013) argue that lack of vision and poor management, lack of a clear integration framework, bandwidth limitation, resistance to change, inadequate training of staff, poor infrastructure and high software costs are some of the factors that make it difficult for online

learning to be fully adopted. However, most institutions in Uganda have some level of online learning (Kahiigi Kigozi, 2012) and this demonstrates the appreciation of online learning.

With the online learning approach, creating a motivating environment where students can learn and feel successful remains a big challenge. According to Grasmuck et al. (2009), in most online environments there is a lack of teacher presence, face-to-face interaction, and technical support required for student motivation. The "absence of non-verbal cues, and text-on-screen is a very limited mode for what should be semantically rich exchanges" (Curtis and Lawson, 2001, p.22) making traditional online learning limited in terms of interactions. However, today online learning has evolved to include the use of social networks and Web 2.0 tools (Conde et al., 2014) and adoption of 3-D Virtual Worlds (Kotsilieris and Dimopoulou, 2014); this makes the online approaches more than text based media.

The other significant constraining issues that institutions (especially those in developing countries) have to deal with in order to successfully adopt e-learning include limited bandwidth, lack of financial resources, inadequate human resource capacity and limited electricity, which Kasse and Balunywa (2013) pointed out in their study.

Essentially online learning means that learning resources can be available online at the convenience of the student regardless of geographical and time boundaries (Bhuasiri et al., 2012). e-Learning systems provide two distinct formats for such interaction - asynchronous and synchronous forms (Hines and Pearl, 2004), which have been explained in the subsequent sections.

2.1.2.2 Synchronous e-learning

Online learning has evolved to include synchronous communication tools that offer more resemblance to face-to-face interaction (Giesbers et al., 2014) in terms of video and voice. Synchronous e-learning is the form of e-learning which supports synchronous media to support natural communication (including, voice, and video) or automated instruction (Oztok et al., 2013). It involves using any learning tool that is in real time, such as instant messaging or video conferencing, allowing students and lecturers to ask and answer- questions immediately (Pathak, 2016). It should be noted however, that depending on a number of factors, some synchronous learning instances may not be desirable.

There are widely available Web-videoconference tools like Skype and ooVoo which offer real-time communication through (a combination of) audio, video or chat (Giesbers et al., 2014) that can be integrated into the traditional e-learning systems to build synchronous e-learning. However, synchronous online learning is not as flexible in terms of time as

student would have to set aside a specific time shop in order to attend a live teaching session or online course in real-time. So it may not be ideal for those who already have busy schedules (Pathak, 2016).

2.1.2.3 Asynchronous e-learning

Asynchronous e-learning may happen when the student or lecturer is offline. That is to say, this type of e-learning does not require both parties (student and lecturer) to be online. Examples of asynchronous online learning include: coursework and communications from the lecturer is delivered via Web, email or messages posted on community forums (Pathak, 2016). Asynchronous e-learning is the dominant form of online learning and occurs in delayed time, and does not rely on simultaneous access for learning outcomes (Oztok et al., 2013) nor does it require the simultaneous participation of students and lecturer (Johnson, 2006).

The asynchronous nature of the instruction in this form of online learning allows students to reflect in greater depth before they share their ideas publicly as argued by Hewitt (2005), who adds that these logistical and educational advantages have inspired many higher education institutions to augment their conventional course offerings with online courses of study. In asynchronous e-learning, a student may follow the curriculum at their own pace without having to worry about scheduling conflicts (where deadlines don't set the pace).

This may be a perfect option for users who enjoy taking their time with each lesson plan in the curriculum or those with language issues or slow learners and would prefer to research a topic on their own (Pathak, 2016). This boils down to technological capabilities as well as the desire for flexibility, which may be a culture issue. Although it has been argued that this form of e-learning allows for more time to reflect on a contribution and refine it more than in synchronous online learning system, it can sometimes lead to misinterpretation of written contributions (like a post on a discussion forum) because of a lack of shared context, body language (Giesbers et al., 2014) or even timely clarifications.

2.1.3 Blended learning

There are definitions given to the term blended learning by different authors. Finn and Bucceri (2004, p.2) defines blended learning as "the effective integration of various learning techniques, technologies and delivery modalities to meet specific communication, knowledge sharing and informational needs". This definition refers to the mixing of learning delivery techniques, which was supported by Osguthorpe and Graham (2003) who described blended

learning as a learning approach that combines different delivery methods and learning styles. Graham (2006) adds that blended learning definitions can be summarized into three phrases; combining instructional modalities (or delivery media), combining instructional methods, and combining online and face-to-face instruction.

What is common in these three definition is the combining of either media, or method, or approach, making blended learning both simple and complex depending on the level of blending (Garrison and Kanuka, 2004, p.96; Justice and Zhu, 2015). For example, combining two media of instruction could be simpler compared to having multiple combinations. What these authors imply in their definition is that blended learning can simply be "the thoughtful integration of classroom face-to-face learning experiences with online learning experiences". They also look at it as being complex and challenging because of unlimited design possibilities and applicability to so many contexts.

What is important in all these definitions is the fact that blended learning involves integration of learning approaches or method. Since this study explored mainly the technology aspect of learning, blended learning environment is used to refers to an integration of face-to-face with online learning contexts, enabling a combination of the advantages offered by both learning environments. This definition also fits Neumeir's (2005) definition of blended learning as a combination of face-to-face and online learning. In other words, blended learning means the provision of learning by using multiple methods of delivery (Justice and Zhu, 2015).

The definition of blended learning adopted for the purpose of this thesis is: learning platform which supports an integrated approach and environment. The learning approach is the mechanism by which learning materials are delivered and the context in which learning occurs. This concept of blended learning has been used in the formulation of this research project and is applied throughout the thesis.

2.2 e-Learning in higher education

Globally, the general trend in higher education is towards adoption of e-learning and this is inspired by the need to meet an increased demand for higher education and to improve the quality of education (Mtebe and Raisamo, 2014). In Europe, for example, at least 96% of the institutions use e-learning, mainly in the form of blended learning (91%), but also in the form of online learning (82%) as reported in a survey conducted by Gaebel et al. (2014). In Uganda, like other countries, adoption of e-learning by the higher learning institutions has been a result of need to meet the increasing demand for higher education as well as the

pedagogical and socio-economic forces such as need for greater information access; greater communication; synchronous and asynchronous learning; increased cooperation and collaboration, cost-effectiveness and pedagogical improvement (Sife et al., 2007).

There have been calls for the institutions in Uganda to provide additional access to higher education by adopting e-learning (Basaza et al., 2010). Experts in this field argue that there are a number of opportunities that e-learning brings and it seems to be the best way to meet the increasing demand for higher education and for enhancement of teaching and learning (Kasse and Balunywa, 2013; Zhu and Justice Mugenyi, 2015). These opportunities that e-learning brings relate to the Internet evolution, which has provided support for larger numbers of students and more diverse types of students, both campus and non-campus based or full-time and part-time (Cunningham, 2016).

The growth of the Internet in the 1990s stimulated the taking off of the e-learning in higher education (Mukoko, 2013) as students could use the Internet to access the digital versions of learning materials unavailable locally (Laurillard, 2006). In the past decades, higher education institutions have been trying to integrate ICT in an effort to augment or supplant the traditional approach of using face-to-face in delivering higher learning to their students (Kituyi and Tusubira, 2013; Tshabalala and Ndeya-Ndereya, 2015; Wu et al., 2010). This approach of learning has become increasing popular in higher education institutions with more than two thirds of the institutions already in the state 'ready to develop it' or 'ready to expand it' (Njenga and Fourie, 2010; Pathak, 2016; Bichsel, 2013) and it is increasingly seen as a tool to enhance the classroom as it more interactive and entertaining, making learning more interesting an motivating (Pathak, 2016).

There continues to be great interest in e-learning across Uganda even though its implementation is an area that is still in progress that continues to evolve with time and further research (Kahiigi Kigozi et al., 2008b). The interest in e-learning comes as a result of its perceived benefits (Bichsel, 2013) as well as the demand by the students and lecturers, especially where there are skilled users and as number of students increases (Kahiigi Kigozi et al., 2008b).

Bichsel (2013) highlights a number of benefits that e-learning provides for institutions as well as for their students and lecturers. For example, an institution that adopts e-learning stands to enhance its reputation and have its curricular streamlined and the users benefit in terms of cost and convenience (Bichsel, 2013; Welsh et al., 2003; Pathak, 2016). Institutions employ a diverse set of strategies of implementing e-learning since there are several

technologies that are available to be used in specifying how the actual learning takes place and in what environment they are implemented (Kahiigi Kigozi et al., 2008b). According to Rosenberg (2001), e-learning implementation strategy could focus on:

> The opportunity, new approaches for e-Learning, or institutional requirements for e-Learning, to determine the action plan (strategy) and technologies for integrating e-learning in an institution. Strategies and technologies offer practical methodologies to accomplish broad integration of e-learning into the learning institution, in addition to identifying areas where it may not be practical or effective (Sanderson, 2002, p.188).

Although there are several technologies that can be implemented, higher education institutions still grapple with them (Guri-Rosenblit, 2006). Mozhaeva et al. (2014) argue that the modern e-learning in higher education evolved from application of separate technologies such as video, multimedia and e-mail to systems such as the learning management system (LMS), mobile learning, gamification, MOOCs, and social networking tools (Bichsel, 2013; Mozhaeva et al., 2014).

This study focuses on two technologies: LMS and social networking tools. The subsequent sections provide the state of these two technologies in higher education.

2.2.1 Using learning management systems

LMS platforms (such as Moodle, WebCT, MyClasses, or Blackboard) are primarily developed to provide online services for students, lecturers, and administrators (Kahiigi Kigozi et al., 2008b). They have been around for more than twenty years (Anderson, 2006) and widely adopted across higher education institutions (Bichsel, 2013) as they have the capacity and functionality of tools designed to facilitate online class. They are commonly understood by both students and lecturers and considered as suitable for formal teaching and learning (Anderson, 2006).

However, it can be argued that LMS still maintain, to a great extent, the traditional roles of students and teachers. Wheeler (2010, p.103) asserts that the use of social collaborative tools as opposed to the LMS is bringing about a pedagogical change where "self-directed and self-organized informal learning, open content, and open learning" are challenging the traditionally accepted roles of both students and teachers. In Uganda and Tanzania, for instance, the Moodle platform is adopted for both on-campus and off-campus use by the students and the lecturers in support for learning content, learning activities and

communications (Zhu and Justice Mugenyi, 2015). Previous studies show that the use of social collaborative tools is preferred and taking root in higher education and therefore challenging the use of LMS (Lockyer and Patterson, 2008; Corbeil and Corbeil, 2010; Otto et al., 2015; Lin and Lu, 2011; Falahah and Rosmala, 2012; Hamade, 2013). This, according to Wheeler (2010, p.110) "is because social collaborative tools support combining the reflective approach to learning with collaborative activities in which students engage collectively with learning materials".

LMS tend to be used to "replicate old-fashioned educational routines, based on the notion of the monolithic student" (Poore, 2013, p.5) without having a fundamental way in which teaching is understood in the 'traditional' sense. Traditional teaching emphasises 'transmission mode' where knowledge flows from the lecturer to the student and not the other way. Nevertheless, there are a number of advantages that LMS offers (Anderson, 2006) especially in regards to extending the traditional teaching approach to an online environment, which is considered by Coates et al. (2005) as an extension of the traditional face-to-face learning.

Since their emergence, LMS platforms have had a fair share of criticism from researchers and academics. They are considered as being institutionally centred, monolithic (Anderson, 2006; Poore, 2013) and flawed (Blackall, 2005). While acknowledging the fundamental flaws in the current LMS, Blackall (2005) suggests the need for people working within education to be those who are media and network literate because such people understand what is meant by liberated information and knowledge, and should be able to comprehend the new relationships between teaching and learning instead of relying on LMS.

Mott (2010) claimed that although central to the business of higher education, the LMS has also become a symbol of the status quo that supports administrative functions more effectively than teaching and learning activities. Poore (2013) confirmed this claim, adding that the earlier design of LMS was based on Web 1.0 that allowed one-way communication as opposed to Web 2.0, which supports two-way communication. Mott's concern was related to this design of LMS, when he highlighted that many students, lecturers, instructional technologists, and administrators consider the LMS too inflexible and were turning to the Web for tools (such as social networking) that support their everyday communication, productivity, and collaboration needs.

This suggests why some studies (such as Kitto et al., 2015; Mott, 2010; Alenezi and Shahi, 2015; Du et al., 2012) have focused on changing the design of LMS to adequately

support interaction and collaboration in order to support flexible online learning approach. As a result, some LMS platforms now enable students to interact with other students, upload content, chat on forums, often in real time.

Successful implementation of e-learning using LMS requires adequate skills of the users according to previous studies. According to Kasse and Balunywa (2013) in Uganda, work is still at large to realize the adoption, utilization, optimization and full potential of e-learning in all higher education institutions. This is mainly attributed to the limitation of staff capacity to implement e-learning and to develop e-learning material on the Moodle platform in (Zhu and Justice Mugenyi, 2015). Other challenges include ignorance and negative attitudes of the users, insufficient infrastructure, high cost and reduced flexibility to adapt to institutional culture, teaching practices (Zhu and Justice Mugenyi, 2015; Unwin, 2008; Sife et al., 2007; Oroma et al., 2013)

Despite the criticisms and challenges mentioned above, some scholars have viewed opportunities offered by Web 2.0 tools as a chance to evolve LMS and make it more interactive and collaborative. Mott (2010) argued that there is a continual pressure for the LMS to utilize and integrate with many of the Web 2.0 tools that students already use freely on the Internet and that they expect to find in this kind of system.

Du et al. (2012) envisaged an e-learning system featured by active participation, interaction and collaboration as a result of integrating LMs and social networking tool. This implied moving e-learning beyond the LMS as earlier suggested by Dalsgaard (2006) based on the potential of social networking tools to engage students in an active use of the Web. What this meant was that e-learning can be self-governed, problem-based and collaborative. The next section details how social networking tools have been used in higher education institutions for e-learning.

2.2.2 Using social networking tools

Social networking tools such as Facebook (Camus et al., 2016; Belnap, 2016b; Kirschner, 2015; Wang et al., 2012; Parslow et al., 2008; Williams et al., 2013) and Twitter (Dhir et al., 2013; Fox, 2013; Gonzalez and Gadbury-Amyot, 2016; Kassens-Noor, 2012; Prestridge, 2014; West et al., 2015) are being used in a number of institutions by students and lecturers in support of e-learning. These social networking tools have been used by hundreds of millions of people around the world (Kumar and Kumar, 2013) especially in providing an interactive environment in which students are engaged in the learning process. They are used

to support academic activity, official or unofficial activities, by students and lecturers (Falahah and Rosmala, 2012) as well as university officials.

Using social networking tools in support for e-learning has been subject to much recent debate within the higher educational community (Jucevičienė and Valinevičienė, 2015). While a growing number of lecturers praise the potential of these tools to engage students with their studies (Dalsgaard, 2006; Du et al., 2012; Mott, 2010), others fear that such applications could compromise and disrupt young people's engagement with the 'traditional' education concept (Njenga and Fourie, 2010). Guri-Rosenblit (2006) for instance, argues that the biggest barrier with use of social networking tools for learning is the enormous numbers, making it challenging to interact adequately. Continuous interaction between students and lecturers and among students themselves could be the most attractive idea behind using these new technologies and also the need to do things differently depending on affordances/constrains. However, this may be challenging in highly populated universities with a small number of lecturers and potentially time consuming.

2.2.3 Social networking and e-learning

Until the advent of Web 2.0 (which include social networking tools), e-learning was typically one way – through broadcasts, one-to-many media such as newspapers, television, CDs, etc. The traditional Internet, described by Poore (2013) as Web 1.0, has been very instrumental in evolution of e-learning. E-learning then was largely seen as Web-based instruction which enabled courses to be organized and delivered online 'fitting' the traditional teaching model. However, as Poore described it, this first approach to e-learning using Internet 1.0 has not been 'social' enough and therefore has failed in terms of real-time interaction. This is the argument supporting the use of social collaborative tools for learning. Wheeler (2010, p.103) describes the use of social collaborative tools as a pedagogical change where that is challenging the traditionally accepted teaching.

This meant that only those with special skills in html coding and other Web service skills could write the content of what appears on the Internet (Poore, 2013). Therefore, e-learning systems that were developed based on this architecture of the Internet could be retrospectively referred to as 'e-learning 1.0'. It may therefore be inevitable that with the evolution of the Internet to Web 2.0, e-learning too is evolving in a significant way to warrant a new name: e-Learning 2.0 (Downes, 2005).

Indeed, learning has dramatically changed with the emergence of Web 2.0 technologies, as they now support social networking, making learning in a more interactive and collaborative way possible. Social networking, which are now part of everyday life for most Internet users, has become a fundamental aspect in the design of e-learning environment because. The main argument according to Tess (2013) is that social networking afforded knowledge construction that was vested in globally diverse networks of learning.

Due to the features drawn from Web 2.0 technology, social networking tools have been seen to offer great opportunities for learning purposes (Siemens and Weller, 2011; McLoughlin and Lee, 2007) hence this has motivated several studies to investigating their success. Lockyer and Patterson (2008), argued that research into the use of social networking technologies to support formal educational experiences is still new and therefore necessitates a case study approach. However, it can be argued that their adoption is widespread.

Other studies have argued that it is necessary to move e-learning beyond what was based on the traditional 'Internet 1.0' to a more interactive and collaborative 'e-learning 2.0' that engage students in real time (Dalsgaard, 2006). e-Learning 2.0 should be aimed at supporting students' learning processes by providing them with personal tools and engaging them in different kinds of social networking tools through "a social constructivist approach which emphasizes self-governed learning activities of students."(Dalsgaard, 2006)

This idea was extended by Chisanu et al. (2012) in a study to design and develop of constructivist learning environment on LMS. According to Chisanu et al. (2012), the development of higher education requires knowledge construction since information is changing all the time and everyone have to learn whatever, whenever and wherever possible.

These studies suggest that, it is essential to prepare the learning environment and process to cope with the present situation, that is, knowledge construction ability. Although the traditional Web-based e-learning system is good for the administrative purposes of learning management (Poore, 2013; Mott, 2010), it falls short of expectation of the students of today who prefer social features available in Web 2.0 technology (McLoughlin and Lee, 2010; Lowyck et al., 2004). Students don't always know the best but they need an environment that support interaction and collaboration in the era of Web 2.0 technologies. It was observed in the work of McLoughlin and Lee that:

> Socially based tools and technologies of the Web 2.0 movement are capable of supporting informal conversation, reflexive dialogue and collaborative content generation, enabling access to a wide raft of ideas and representations (McLoughlin and Lee, 2010).

These authors assert that these tools shift control to the student as per the students need. However, promoting student agency, autonomy and meaningful engagement, may depend on their perception on the educational affordance of these tools.

Previous studies have demonstrated that social networking platforms are essential in promoting e-learning especially because of their capability to support flexible learning groups. A recent study by Mayende et al. (2015) found that peer assessment based assignment was effective using a Facebook learning group as an online learning environment. This is what Torres-Diaz et al. (2015) refer to as social learning environments, through which interactions and collaborations are possible. In this kind of e-learning environment, students collaboratively work together and post their findings on their group area and interactions are encouraged.

In Makerere university for instance, it was found that social networking platforms improved the quality of e-learning through increased interactions and easy monitoring individual student's participation in the online learning groups (Mayende et al., 2015). In Uganda distance learning is mainly based on the first generation model which is characterized by blending print study materials with occasional face-to-face sessions. Student are given hard copy self-instructional study materials and regularly attend two-weeks face-to-face sessions at the university twice each semester (Mayende et al., 2015). In this scenario, social networking platforms can be useful in providing online learning groups in which students can interact and collaborate prior to the face-to-face sessions in which they can form discussion groups (Mayende, 2007).

The social networking platforms in this case allow students to contribute learning content, engage in discussions with other students and to share personal information with each other (Anderson et al., 2015). They can also use online learning groups provided by social networking platforms to complete tasks assigned by their lecturers (Bunney, 2015; Curtis and Lawson, 2001; Kahiigi Kigozi et al., 2011). This is also applicable to on-campus learning programmes (Belnap, 2016a; Gardner, 2010).

2.3 Interactive e-learning

Interactive e-learning places emphasis on interactivity in the learning process. Williams et al. (1988) defines interactivity as the degree to which participants in a communication process have control over, and can exchange roles in mutual discourses.

Interactivity is not only possible in e-learning however, the e-learning environment can provide a wider option for interactivity. Of late, the term interactivity is considered to be the most important element for e-learning success and it is viewed by many as one of significant features of the Web 2.0 (Violante and Vezzetti, 2015). An interactive e-learning environment can lead to improved student performance compared to text-only conditions (Bernard et al., 2009; Zhang, 2005) especially where there is multimedia effect. Some students find it more helpful to learn from words and pictures than from words alone in an e-learning environment (Mayer, 2003). This can be useful in developing abilities and skills of the student and therefore it makes effective, the learning process (Violante and Vezzetti, 2015).

An interactive e-learning environment can be provided with text, animations, simulations, audios, videos, and films. This provides rich student-content interaction (Zhang et al., 2004), enhancing learning, for example, through visually stimulating a student and transforming learning into an active engaging process (Violante and Vezzetti, 2015). This study focuses on interaction that goes beyond student-content to include social interaction such as student-student and student-lecturer in both formal and informal manner. This is why emphasis is placed on LMS and social networking tools. Using these and other tools can support effective interactive e-learning (Alenezi and Shahi, 2015; Du et al., 2012; Violante and Vezzetti, 2015).

Besides interacting with each other, those involved in an interactive e-learning environment could watch a video of the lecturer, hear what he/she says, and read associated slides and lecture notes (Zhang, 2005). Recent studies also confirm that an interactive e-learning environment has a direct positive impact on the academic performance outcomes of students (Wan, 2016; McLaughlin and Rhoney, 2015). The next section focuses on interaction among people involved in the e-learning environment – collaboration, which is an aspect of e-learning that this study focuses on.

2.4 Collaborative e-learning

According to Kahiigi Kigozi et al. (2011), collaborative e-learning is based on the notion that knowledge construction is a social event. Cooperative interactions that occur in group work or discussion forums promote collaborative learning (Mayende, 2007) and this can be supported by the various social collaborative technologies available to students and lecturers.

Knowledge construction, according to Vygotsky's (1978) social constructivist's theory, relates to social interaction as a means of individual cognitive development and learning. This implies that interaction in collaborative online environments promotes collaborative e-

learning. Through social interactions, students with different perceptions tend to improve their understanding of concepts or learning objects (Kahiigi Kigozi et al., 2011), with is in line with Vygotsky's learning theory. Individual students construct their knowledge through the process of negotiating meanings with others within the collaborative e-learning environments (So and Brush, 2008), normally within a group of learners that share a common learning culture (Pillay and Alexander, 2015).

Collaborative e-learning should be viewed as a self-governed, problem-based and collaborative social process (Dalsgaard, 2006). Since there is an increased level of online interactions among Internet users, collaborative e-learning environment beyond traditional LMS becomes more suitable for both students and lecturers according to Du et al. (2012). Besides the interaction with the e-learning platform for the purpose of accomplishing an individual work, it is important to take into consideration the development of group works carried out in collaboration with other peers (Wessner and Pfister, 2001). Group works allow students to interact with each other and with the lecturers as they work towards achieving the given task and in the process they construct and share meaning. This learning approach may induce other beneficial outcomes such as increased learning, improved working relationships, more positive student attitudes toward school (Chiu, 2000) and this may impact positively on individual student's achievement (Lou et al., 2001).

Collaborative e-learning environments provide a set of tools for students acting in groups to interact and accomplish an assigned task(Chiu, 2000). When two or more individuals act together in a collaborative (or cooperative) manner, they support each other by sharing their ideas, knowledge or competencies with the purpose of accomplishing a given task. A collaborative e-learning environment stimulates learning, increases motivation, promotes feelings of belonging to a team, encourages creativity, eases communication and increases the achieved personal satisfaction for the educative process (Plantamura et al., 2004; So and Brush, 2008). In this kind of environment, students are free to express and communicate with each other (Casamayor et al., 2009), which increases participation and motivation to learn.

When using a collaborative environment, the basic interaction mechanism students have to collaborate with their peers and others is through proposals and counter-proposals within a structured discussion (Casamayor et al., 2009) that can be set up by the lecturer or students themselves. A structured group discussion consists in a workspace similar to a forum in which students can make proposals and vote based on fixed topics. In this case, these

topics are the tasks proposed by the lecturer for the collaborative work (Casamayor et al., 2009). Similarly, collaborative learning can be achieved in the offline environment normally in the form of asynchronous discussion forums (or groups) as an adjunct teaching medium (Pillay and Alexander, 2015). Offline collaborative learning environment can also be useful for student who are undertaking a full time (face-to-face) or part-time (distance learning) programme in much the same way as the online collaborative learning environment in the sense that when students physically meet in a discussion group, they communicate, interact or collaborate.

Although historically, the most common instructional strategy was to have students work individually at a computer (Lou et al., 2001), today there are a number of tools that are being used to provide collaborative environments so students can work in online groups. Facebook group for example, is widely adopted as a collaborative e-learning platform (Wang et al., 2012) and used in place of the 'traditional' LMS platforms. This may be attributed to the capability of those LMS platforms to support collaborative e-learning.

2.5 Social collaborative e-learning

Social collaborative e-learning (SoCeL) is the main concept in this research and a separate chapter is dedicated to explore its conceptualization in greater detail. Chapter 3 explains how this central theme was formulated and the context in which it should be understood. It is used as a way to provide a new understanding of the modern e-learning approach. Although several research efforts are geared towards interactive e-learning (Wan, 2016; Violante and Vezzetti, 2015; McLaughlin and Rhoney, 2015; Alenezi and Shahi, 2015; Elgamal et al., 2013; Du et al., 2012; Lin and Bhattacherjee, 2008; Kalyuga, 2007; Zhang, 2005; Smith et al., 2005; Ghaoui and Janvier, 2004) and collaborative e-learning (Swan et al., 2014; Kahiigi Kigozi, 2012; Kahiigi et al., 2012; Kahiigi Kigozi et al., 2011; Casamayor et al., 2009) separately, there is still ongoing debate on the effective implementation of SoCeL, making is an attractive research direction.

It is important to understand social collaborative technology in order to appreciate the meaning of SoCeL. When we talk about technologies (such as social networking tools and learning management systems), it is not all about technologies per se but rather, an approach to learning with it, as pointed out by Bunney (2015). While explaining the meaning of social collaborative technology, Bunney's argument was that it's about what we do with the technology, how we craft more effective and dynamic learning experiences through that

technology. These e-learning experience need to support the student when they need it to enhance performance (Bunney, 2015).

Bunney's argument follows Stodd's (2015) view on how social collaborative technology can support an effective approach for future learning - by facilitating communities. However, this is only possible if participants have the understanding of the role and have trust in order to fully engage. Within the context of an online community, the roles an individual undertakes can be emergent, in the case of the Web 2.0 community, or can be more or less rigidly defined, in the case of the knowledge representation / Semantic Web community. Parslow et al. (2009) argue that Web 2.0 enable individuals to be creative to construct a community knowledge base.

This is termed a 'folksonomy', that is, when individual actions of many people using social collaborative technologies create the knowledge base; often is categorised as 'informal' unlike the formal approach to represent knowledge, called ontology. Computer semantic is often used to create such form knowledge representation. Parslow et al. (2009) suggest that connecting two approaches of creating community knowledge base could be interesting and beneficial.

This is so in the case of the SoCeL model where a learning environment aims to provide a blended approach having informal and formal online communities. When the two approaches are connected, the knowledge that is created in 'folksonomy' could be utilised in learning analytics to facilitate the management of informal learning (discussed in section 2.5.1) and educational collaborations (discussed in section 2.5.3)

Therefore, for social collaborative technology to support learning effectively there is need to look at learning design and community management, how they form, guide and narrate the learning and how they build trust. This can be done following the principle of what Parslow et al. (2009) refer to as 'Folksonomological Reification', they defined it as producing tools that help an individual to study these relationships, discuss them with their communities, and share their conclusions will enable Web 2.0 users to undertake collaborative folksonomology.

'Folksonomological Reification' could be helpful in the design of SoCeL environment. However, it calls for understanding the technology platforms and the nature of online communities that they are likely to support. This is also in line with Stodd's (2015) emphasis on nurturing communities and providing the right types of learning spaces and

permissions to the learning community for social interaction and collaborative learning to happen in an organised environment.

The SoCeL concept coins three important elements, namely: informal learning, social networking, and learning management. These are not new terms as they have been used in other learning approaches including Personal Learning Environments (PLE) (Dabbagh and Kitsantas, 2012; Martindale and Dowdy, 2010; Sclater, 2008), except that the SoCeL model of learning seeks to bring them together in way that supports 'Folksonomological Reification' for effective management of interactive and collaborative e-learning.

Informal learning for instance, has drawn the attention of many policy makers, educators and researchers in higher education sector. There is an increasing amount of effort to recognise informal learning not only as the alternative access route into higher education but as strategy for achieving formal educational goals by blending it with formal learning (Ainsworth and Eaton, 2010; Johnson et al., 2015; Malcolm et al., 2003b; Mott, 2010). As the use of social collaborative technology increases in higher education, more effective ways are needed to achieve SoCeL through informal e-learning, for example, by the use of digital badges. In many cases, digital badges are used to motivate continued engagement, which increases time on task and supports skill acquisition through performance since they provide new affordances for online educational activities and experiences (Gibson et al., 2015). More details on this and the other two terms are presented in the next chapter.

2.5.1 Managing informal e-learning

Sefton-Green (2004) regards informal e-learning as learning with digital technologies that goes beyond institutional contexts. This includes use of computers, mobile phones, digital television and so on as part of informal day-to-day lives. There continues to be an increasing interest in recent years in how such learning can be supported by technology, with many extensively using their personal data assistant (PDA) or smartphone when away from the PC (Clough et al., 2008).

Informal e-learning occurs as people actively participate in the creation and exchange of knowledge within and between online community centres in what is referred by Cook and Smith (2004) as informal community e-learning. Trentin (2005) later extended this concept to cover professional communities, such as teachers' online professional community of practice (Lave and Wenger, 1991). This is also described in the work of Tseng and Kuo (2014) in which the authors claimed that informal e-learning community has become an

important platform in which individuals who share similar interests or common goals get together and work collaboratively; improving individual's as well as organizational performance.

Trentin's (2005) argument was that informal e-learning should be viewed as a learning process "trusted to the synergetic and collaborative action typical of professional communities which learn through the network and in the network other than a formal educational process designed and run by a provider".

This is why in the design of a SoCeL environment, the learning community is extended to include external world and informal networks in which the students and lecturers interact within their learning spaces in similar ways to CoPs, PLEs, and PLNs. For example, in the case of CoP, the need to acquire knowledge rapidly, in order to tackle a specific professional problem, gets increasingly challenging. This is especially true in relations to strict implementation times of the formal learning programme and therefore, informal e-learning becomes handy (Trentin, 2005).

Likewise, within higher education, the concept of a community of practice is essential for the success of e-learning (Hung and Yuen, 2010) and according to Tess (2013) the use of social collaborative technology to enhance the CoP in the university classroom makes for a logical argument. In higher education, however, although there is an increasing adoption of social collaborative technologies by students and lecturers (Jucevičienė and Valinevičienė, 2015), there has been limited academic research focusing on the issues of using them in supporting learning in formal way.

Despite the limited academic research in this area, there is a plethora of online articles talking about issues of people, using social collaborative technologies and their implications on (especially) young people, which is surely where attention must be focused instead of moving this debate forward relative to ICT use in higher education (Oliver and Clayes, 2015). This is the gap that motivates this research.

For example, while some lecturers have used Twitter for in-class discussions, previous research show that Twitter has become part of the teaching practice in supporting active, outside-of-class informal learning as it facilitates sharing of ideas beyond the classroom via an online platform that allows readily available access at random times to continue such discussion (Kassens-Noor, 2012). The question that remains unanswered is *what can we learn from these activities that can help us in designing our approaches to formal education at higher educational institution?* This question and other related issues around management

of informal e-learning as a scaffold of formal education demonstrate the why this research area is of significance.

2.5.2 Educational affordances of social networking technology

The concept of affordances was developed by Gibson (1977), an American ecological psychologist, who used it to claim that the niches that animals and also humans live and thrive in are not formed by their habitat, but by the opportunities of action that these surroundings offer the life forms in question. This is more applicable especially when it comes to humans where the role of perception of opportunities by individuals or collectives becomes an important topic. Only those possibilities of action that are understood and deemed possible will be considered options, or affordances.

Although Gibson's focus was on both animals and humans' existence in physical and social habitats, it is important to know that, human societies are more flexible in space and time and therefore making the concept even more variable. The main argument here is that unless the users and those who influence the decision-making come to the understanding that the technology brings huge opportunities, its adoption may not be effective.

Social networking technology is viewed as a distraction and offered no educational benefit (Brabazon, 2012). It is commonly argued that social networking is time-wasting and socially isolating, and at worst it allows paedophiles to groom children in their bedroom or sees teenagers lured into suicide pacts while parents think they are doing their homework (Livingstone, 2008).

Many people in authorities used these kind of arguments to block social networking services as way of 'protecting' students against wasting time, bullying, and invasions of privacy. Many institutions initially banned or restricted Internet use, only to ease up when the educational value of the Internet became clearer (Crane, 2009), which action has a lot to do with the issue of perception and affordance other than the technology itself.

Until recently, schools banning students from using social networking technology in the classroom was commonplace (Waters and Lester, 2010). Even lecturers were banned from contacting students using social networking tools (Mallia, 2013). But in the last few years, that attitude has begun to seem quaint, outdated and unproductive and social networking technology use in higher education has become commonplace (Waters and Lester, 2010) despite the constraints which makes their effective adoption debatable. However, in order to fully understand their full potential, the concept of affordance is essential as it helps establish

to what extent social collaborative technology may support learning. This may not necessarily mean the opportunities but also how to go about with the constraints. Of course with any technology there are constraints and this is why the affordance concept is used.

Gibson's affordance theory states that the world is perceived not only in terms of object shapes and spatial relationships but also in terms of object possibilities for action (affordances) — perception drives action (Gibson, 1977). This basically implies that abilities of a user to utilize social networking technology for specific learning activity within socio-educational environment are determined by his/her perception. In other words, possibilities of action perceived by a user of a technology determined what he/she does with it.

The affordance of social networking means that their potential in enhancing teaching and learning should be understood. Universities have challenges in understand in how to use social networking tools to support learning, in part due to the "perceived fluid nature" of these tools (Lewis, 2015a). This why it is important to explore the positive aspects of these tools whilst recognising these present a great deal of opportunities to support teaching and learning in a collaborative environment.

2.5.3 Managing collaborative e-learning

In an environment with a number of collaborative learning technologies and activities, there is a need to have a way to manage the learning process. Students are often leveraging a number of different social collaborative technologies, communities, and networks towards the achievement of their personal learning objectives and goals (Absar et al., 2016). Online collaborative learning activities such as group work requires quality interaction, timely feedback and provision of support (Xu et al., 2015).

One of the approaches to help in managing collaborative e-learning activities is by use of learning analytics as they collect data on student participation in specified learning activities across social collaborative environments, and present information about the nature and quality of the learning interactions (Kitto et al., 2016). Learning analytics such as the *Connected Learning Analytics Toolkit* (CLA Toolkit) (Kitto et al., 2016) and other social media reporting tools are useful in capturing, storing and reporting the student's interactions with learning resources and their online learning activities to advance our understanding of

the learning process (Gašević et al., 2015). They can answer questions about the use and effectiveness of social collaborative technologies as learning platforms (Rhode et al., 2015) especially in terms of measurement, collection, analysis and reporting of data about students and their activities, for purposes of understanding and managing learning and the environments in which it occurs.

Managing collaborative e-learning requires detecting and studying collaborative learning processes for example, linking multiple online identities of students (actors) and their contributions and activities across several social collaborative technologies in order to study their learning behaviours in open online environments (Absar et al., 2016). This is especially important as SoCeL supports use of multiple technologies to support blended learning and thus the need to know what work they actually accomplish in support of learning.

Another way to manage learning processes in a SoCeL environment is determining how the students (actors) interact (relations) with others as they collaborate on learning tasks. The idea of establishing the actors who are connected by relations analysis technique - the class network structure based on the graph theory, was recently used by Haythornthwaite et al. (2016) to highlight how some individual students are closely connected to others, some are at a distance and some not connected at all. It can also be used to investigate behavioural patterns in a class, the type of connections and sub-connections occurring between students, and the interactions (Kitto et al., 2016).

Such knowledge can be useful in managing collaborative learning tasks that go beyond what is available within the current LMS. The CLA toolkit (Kitto et al., 2015) uses a Learning Record Store (LRS), allowing for an interface to be developed to enable data to be extracted from social collaborative technologies, imported into a LRS, and processed for display in the dashboard which should normally not access private content and where such privacy risks exist, the access should be anonymous. According to Kitto et al. (2015), student data from beyond the LMS can be harvested in specific circumstances if a student allows for their social collaborative usernames to be matched against the actor identifier that is used in the LRS. This makes it possible to display on the analytic dashboard records of student' activities related to the learning material including: commenting, viewing, sharing, liking, disliking, tagging, and hashtagging.

In general, managing collaborative e-learning is an important aspect of SoCeL as this makes it possible to make it effective and rewarding for both formal coursework and informal

individual work. For attribution of marks in summative assessment items, this can be facilitated by a learning analytic (Kitto et al., 2015). Learning analytics data provides opportunities for informed decision-making at both institutional and practice level (Gunn et al., 2015). Learning analytics features offer insights into learning processes, allowing the lecturer to identify student gaps in understanding over simple performance measures. Such insights enable lecturers to identify weak points in the learning activities performed by their students; topics the students have struggled with, and provide instructive and process related feedback on how to improve their learning (Gašević et al., 2015).

2.6 Social collaborative e-learning environment

One of the areas of focus for this study is on the learning environment suitable for SoCeL as an innovative approach to social practices of teaching and learning and the use of learning spaces and technologies (Blackmore et al., 2015). A learning environment is defined as dynamic interaction of physical, interpersonal, and socio-cultural conditions with the student and lecturer. These conditions could include technological, psychological, and pedagogical environment (Chisanu et al., 2012).

These conditions may include diverse methods and techniques (Konradt, 2004), physical or virtual platforms (Mvududu, 2003; Sirkemaa, 2006), context and culture (Memmott and Brennan, 1998) in which learning occurs. It can therefore be a traditional (physical) classroom characterized by face-to-face delivery of learning materials, e-classroom (a virtual platform) characterized by online delivery of learning materials, or a mix of physical and virtual classrooms in which a blended pedagogical approach is adopted. It can also be contextual and cultural factors, such as culture-specific preferences for communication modes, which influence the learning process (Ardichvili et al., 2006). Online learning which involves having learning curriculum offered in an online delivery mode, via the Internet without lecturers and students being at the same location or time (Richardson and Swan, 2003).

From the definition above, three elements of a learning environment may be identified as: what, how, and who. These refer to what are to be learnt (learning materials), how this can be learnt (method of delivery) and who are involved (for example, student and lecturer) which may be helpful in explaining the learning environment. Because learning is a social process (Clements and Battista, 1990), active interactions between student and lecturer can have a significant influence on the learning environment. This is in line with the connectivist learning theory (Siemens, 2005), which emphasises 'bridging the social relationships and

communities' in which learners participate, and the discovery, sharing, filtering, and often co-construction of knowledge (Absar et al., 2016)

Effective interactions and collaborations among students and lecturers are essential for enhancing the learning environment (Du et al., 2012). Such interactions do not only facilitate access to learning materials but also help in building strong relationships that provide emotional support, class organisation, and instructional support (Jankowska and Marshall, 2004; Cheung et al., 2011). There are a variety of technological platforms including learning management systems, such as Moodle (Mott, 2010) and social networking tools, such as Facebook (Wang et al., 2012; Gardner, 2010) that may be employed to enhance the learning environment in support of a social constructivist approach to e-learning (Dalsgaard, 2006).

2.7 Adoption of social collaborative e-learning

There are many theories that try to explain why people choose to use a particular technology to support their educational activities (Czaja et al., 2006; Talukder, 2012; Player-Koro, 2012; Lin and Lu, 2011; Ajjan and Hartshorne, 2008; Sharples et al., 2005). One such theory is the technology acceptance model (TAM) (Davis et al., 1989; Davis, 1986), which underpins this research.

A study by King and He (2006) has shown that TAM is a credible model, which has been widely used, but which potentially has wider applicability. As reported in a study by Chuttur (2009), TAM was first proposed in a PhD thesis by Davis (1986), and is illustrated in Figure 2.1. The model was developed by extending the theory of reasoned action (Fishbein, 1979; Davis et al., 1989) to establish better measures for predicting and explaining the use of technology (Davis, 1989) using two theoretical constructs, perceived usefulness and perceived ease of use, which were theorised by Davis to be fundamental determinants of system use.

It was proposed in TAM that technology use is a response which is predicted and explained by user motivation, which in turn, is directly influenced by an external stimulus consisting of the actual system's features and capabilities (Chuttur, 2009). The theory suggests that when users are presented with a new technology, a number of factors influence their decision about how and when they will use it.
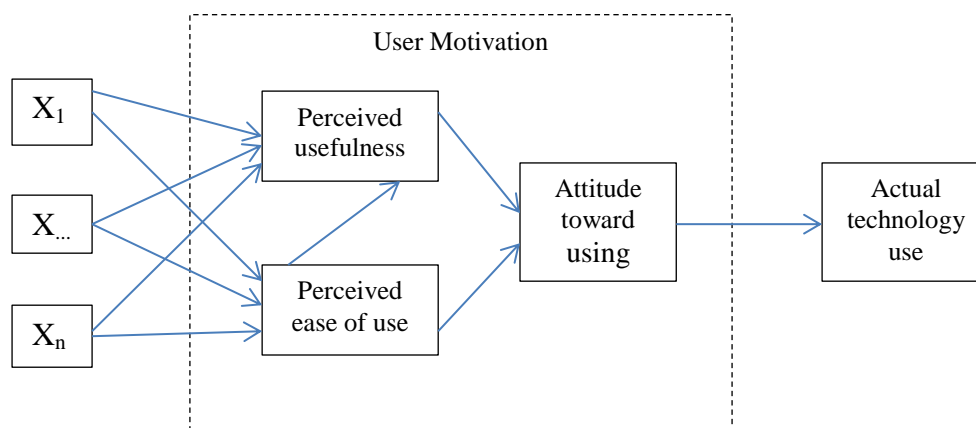
Figure 2.1 The original TAM proposed by Davis (1986)

The external factors, such as personal skills, social influence and infrastructure, represented by $X_{1\ldots n}$ in Figure 2.1, constitute determinants for actual use of a technology through mediated effects on perceived usefulness and perceived ease of use (Park, 2009). These determinants represent individual differences, situational constraints, organisational characteristics and technology characteristics impacting on behaviour (Saadé and Kira, 2007).

TAM has been used in several studies to explain how eLearning is adopted and used (Park, 2009). This study explores the adoption of SoCeL in higher education where the major users are students and lecturers. It specifically explores the determinants (external factors), user motivation (internal factors), and the actual use of SoCeL by university students and lecturers. Relationships between various factors are also be explored to determine how they influence the adoption and use of SoCeL.

2.8 Integrating social collaborative e-learning in higher education

Integrating e-learning in higher education face a lot of challenges as highlighted in the literature. One of the challenges relates to the fact that learning takes place in a virtual environment (Tynjälä and Häkkinen, 2005) and the other relates to the adoption of social collaborative technology (Davis et al., 1989; Davis, 1986).

A SoCeL environment includes social, pedagogical, and technological contexts in which students and lecturers actively interact and collaborate. The fact that a SoCeL environment entails active interactions between student and lecturer, the lecturer needs as well to maintain what Garrison (2011) refers to as 'social presence' in order to effectively influence the learning process. Social presence is defined by Cobb (2009) as the degree to

which a person is perceived as "real" in online communication. When both the students and the lecturer maintain the social presence, there can me an increased level of participation. SoCeL environment, like any online learning environment, can be accompanied by the 'sense of isolation' therefore, encouraging social presence is a credible move.

Sense of isolation refers to having no feeling of belonging or being welcomed, or a feeling of social insecurity, and it is essential in a SoCeL experience and in establishing cognitive presence (Garrison, 2011). In terms of pedagogical context, the SoCeL environment requires knowledge of how to moderate critical discourse in virtual learning (Garrison, 2011), which can involve synchronous or asynchronous interactions in formal or informal environments. In general, e-learning innovation in higher education is driven by the convergence of technological and pedagogical developments (Garrison, 2011). This means that the rapid changes in technological advancement pose a challenge in the integration of SoCeL. It is a challenge when new technologies are introduced (Garrison, 2011).

SoCeL adoption in higher education is influenced by many factors. According to TAM theory (Davis, 1986; Davis, 1989; Davis et al., 1989; Venkatesh and Davis, 2000), SoCeL adoption is dependent on external and internal factors that influence the user's motivation (intention) to use the technology. This is also in line with the concept of affordance relating to how one's perception and the actual use of a tool. In other words, how one uses the social collaborative technology, may be determined by his /her perception about that technology.

In order to explore these challenges and determine the requirements that might enable effective integration of SoCeL, a requirements engineering approach is essential because it supports separating the problem from the solution, enforcing prior analysis of the problem before suggesting any solution (Naudet et al., 2010), which is the approach this research takes.

2.9 Relevant e-learning theories

SoCeL research largely falls within a constructivist philosophic paradigm. The main assumption in creating SoCeL model is to provide what Dewey (1916, p.36) described as "more opportunity for conjoint activities in which those instructed take part, so that they may acquire a social sense of their own powers and of the materials and appliances used".

The social collaborative technologies afford students enormous educational opportunities, allowing them to participate easily in the creation of content, websites, and their own learning spaces. Students can build on their own experiences and be in control of their own learning. With SoCeL environment, we can now readily create such opportunities

for students because social collaborative technologies put learning–not teaching–at the centre and thus allows students to take part more actively and creatively in their own learning (Poore, 2013).

Students taking part in their own learning as opposed to the traditional teacher-centred approach of education is in line with the Nyere's philosophy of education. He said teaching, which introduces a slave mentality or a sense of importance, is not education at all – it is an attack on the minds of men. (Nyerere, 1978). This means that unless one gets actively involved in his or her learning process, the opportunity to discover, share, and appreciate knowledge is curtailed, hence causing dependency.

Dewey recognised the importance of philosophy in his book, *Democracy and Education* when he made the point that we are unable to plug directly into another person's brain. We never educate directly, but indirectly by means of the environment. Whether we permit chance environments or whether we design environments for the purpose makes a difference. The gist of this research is determining how SoCeL environments can be created adopted and integrated within the university system for effective learning. Therefore, understanding, from the theoretical perspective, the effectiveness of SoCeL is essential. The learning theories explored in the next sections are: social constructivism, connectivism, and social cognitivism.

2.9.1 Social constructivism

Social constructivist learning theory can be used to explain a learning situation in which students are divided into a number of cooperative groups and each group assigned one task to be completed together with the guidance of a lecturer. If the groups were to explore together the assigned task in order to create a shared understanding of their assigned task and use that shared understanding as a basis for them to produce a product that is created through a social learning process, then we would describe this as social constructivism (Kim, 2001).

Social constructivism therefore, is a social theory of knowledge that applies the general constructivist philosophical paradigm into social settings, wherein groups construct knowledge for one another, collaboratively. The theory emphasizes the importance of culture and context in understanding what occurs in society and constructing knowledge based on this understanding (McMahon, 1997). According to Kim (2001), this works well if group is comprised of various students with diverse interests and backgrounds, each member having something unique to offer in their group's construction of the product. In other words, social

constructivism emphasises how meanings and understandings grow out of social encounters or settings.

Social constructivism is not a new idea at all. It has been used to define various situations of learning such as active learning, discovery learning, peer learning, situated learning, Web learning, and contextual learning. It has also been used to define key concepts related to collaboration such as the community of practice. Some studies (such as Kim, 2001; Lave and Wenger, 1991) attribute the origin of this concept to Lev Vygotsky (1978) who asserted that learning is a social construct which is mediated by language via social discourse. Vygotsky underscores social influences on cognitive development, placing more emphasis on the fact that much important learning by the student occurs through social interaction with a skilful educator. Take for example, the lecturer may model behaviours and/or provide instructions for the student. Vygotsky refers to this as cooperative or collaborative dialogue, the basis of basis of sharing individual understanding and creating a common understanding.

Several scholars agree with this social constructivist theory of learning and consider learning as set in participatory social context. This is how Lave and Wenger (1991) considered students as community of practice in a situated learning model proposed to make it easy for knowledge construction by situating learning in specific context and embedding in particular social and physical environment. Hung and Yuen (2010) also used the same community of practice as a basis for designing a blended synchronous learning model for educational international collaboration.

2.9.2 Connectivism

Connectivism, according to Siemens (2005), is a learning theory which attempts to explain how opportunities have been created by the modern Internet technologies for people to access, synthesise, and share information across the network. It relates to the collaborative and social nature of learning that engenders a pedagogical approach based on forming connections. The exchange of resources, whilst harnessing information flow across networks and social collaborative technologies, allows for emergent, self-directed learning to flourish (Absar et al., 2016). This is what Kop et al. (2011) described as a pedagogy based on the building of connections, collaborations, and the exchange of resources between people, the building of a community of students, and the harnessing of information flows on networks in which lecturers and students get actively involved in creating networked learning experiences.

This connectivist approach to learning – where students negotiate and construct meaning and knowledge across a network of students, platforms, and information sources – emphasizes the interconnected nature of learning (Absar et al., 2016). Students develop their sense -making and connections-forming abilities by relating knowledge fragments across a variety of environments, within a large pool of collective knowledge, trying to recognise patterns which appear to be hidden and forming connections between specialised communities (Siemens, 2005).

Connectivism is a theoretical framework for understanding online learning. In connectivism, the starting point for learning occurs when knowledge is actuated through the process of a student connecting to and feeding information into a learning community such as online friends. A community being the clustering of similar areas of interest that allows for interaction, sharing, dialoguing, and thinking together (Kop and Hill, 2008). According to Kop and Hill (2008), in the connectivist model, a learning community is described as a *node*, which is always part of a larger network. Nodes arise out of the connection points that are found on a network. A network is comprised of two or more nodes linked in order to share resources. Nodes may be of varying size and strength, depending on the concentration of information and the number of individuals who are navigating through a particular node.

2.9.3 Social cognitivism

Cognitivism focuses on exploring people's mental activities in the learning process, where knowledge can be described in terms of mental constructions. These mental activities include thinking, memory, knowing, and problem-solving. Social cognitive theory has been useful for understanding an individual's use of computer (Compeau et al., 1999). Because this theory focuses on social and cognitive processes that govern human behaviour, it may also be useful for understanding social collaborative technology usage in the social support context as well (Lin and Bhattacherjee, 2009).

The social cognitivist theory gives prominence to the concept of self-efficacy, defined as one's belief in his or her ability to perform a specific behaviour (Compeau et al., 1999). In the social collaborative technology usage context, social collaborative technology self-efficacy can be defined as users' beliefs in their personal ability to use a given social collaborative technology (Lin and Bhattacherjee, 2009). The notion of social collaborative technology self-efficacy suggests that our expectations of the positive outcomes of using social collaborative technology may not necessarily motivate the way we use them (usage

behaviour), unless we also believe in our ability to use the target social collaborative technology appropriately. Implying that it is not just about convincing people of the affordance to be derived from a technology (selling the technology). It must also be about coaching, teaching, and encouraging individuals to ensure that they have the requisite skills and confidence in their skills to be successful in their use (Compeau et al., 1999).

Based on the social cognitivist theory, self-efficacy plays an important role in shaping individual users' behaviours of social collaborative technology usage. Self-efficacy is based on an individual's self-reflective capabilities, and stronger beliefs in one's ability to use a specific social collaborative technology may thus lead to greater levels of IT usage (Bandura, 1986). Accordingly, weaker social collaborative technology, self-efficacy beliefs are also expected to relate to lesser degrees of its usage. This positive relationship between social collaborative technology self-efficacy and social collaborative technology adoption and usage was empirically proved by Compeau et al. (1999).

A cognitivist SoCeL environment is based on the premise that students learn best when instruction is based on their own experience and prior knowledge. It is the role of the lecturer to learn and mould students' own experience and prior knowledge and use them to facilitate further learning. Social cognitivist theory emphasizes the importance of observing and modelling behaviour, attitudes, and emotional responses of others (Dabbagh and Kitsantas, 2012).To gain more skill therefore give more degree of self-efficacy and possibility of successful integration.

In the next chapter, the approach adopted in developing this research is fully discussed. Methodology in terms of research design, data collection and analysis are explored.

2.10 Requirements engineering method

To understand how effective SoCeL can be integrated in higher education, requirements engineering process can be used as a methodological basis. This process involves eliciting individual stakeholder challenges, expectations and needs before developing them into detailed, requirements, documented and specified in such a way that they can serve as the basis for further research and development activities (Pohl, 2010).

One of the fundamental principles of requirements engineering entails that if a new solution (SoCeL integration model) is to be adopted, it is a good idea to describe the problem to be solved separately from particular solutions to the problem (Nuseibeh and Easterbrook, 2000). In this case, the focus of the research is to explore ways of effectively integrating SoCeL and thus, an important aspect of this study relates to understanding the requirements

in terms of concepts, environment, and adoption from the perspective of the principle users of the system (students and lecturers). According to Nuseibeh and Easterbrook (2000), it is important to distinguish between requirements and specifications, and to describe the relationship between them. Further explanation on how requirements engineering is used in this research is presented in 4.3.1

2.11 Summary of literature review

There is a large amount of interest surrounding the use of social collaborative technology in higher education. It is apparent that social collaborative technology has transformed society in general and higher education in particular where by many students and lecturers are using these tools to support their educational activities and as part of their lives. Although SoCeL is part and parcel of the lives of students and lecturers, its effective integration within the higher educational environment remains a challenge yet there is little attention accorded to it.

Understanding the SoCeL concept is an important step towards its effective integration. In this chapter, a review of literature surrounding this concept was provided in order to provide foundation for understanding the topic and the context in which the study was conducted, and introduce the concepts that relate to the research focus and direction. These concepts define the gap in the body of knowledge and set the boundaries covered by this research and other directions within this area of research.

The literature review revealed that e-learning in higher education is moving towards a blended approach in which both online and face-to-face learning takes place within synchronous and asynchronous environments with a multitude of technological platforms to support social and collaborative interactions between students and lecturers.

The gaps that were identified include managing informal e-learning, perception on the extent of use of social collaborative technology, and managing collaborative e-learning. This is especially realised if a fully SoCeL environment is to be established in line with the originally proposed networked learning model proposed by Mayes and De Freitas (2004). This research addresses the gap in literature to gain deeper understanding of the SoCeL integration in higher education in terms of its environment and adoption from the perspective of the students and the lecturers. This knowledge provides the basis of introducing SoCeL integration frameworks which are presented in Chapter 7.

The following chapter presents the conceptual framework for this research. It expands the review on concepts and theories on supporting this research.

Chapter 3

The Conceptual Framework

This chapter explores the conceptualization of social collaborative e-learning (SoCeL) in greater detail to expand on the introduction given in section 1.2.1. It explains how this central theme was formulated and the context in which it should be understood. SoCeL concept was developed through literature study as well as the researcher's experiential knowledge. The concept represents the main theoretical views which have been influential and was all together used to make sense of this research and create a conceptual and theoretical foundation for it.

The SoCeL conceptual framework provides the understanding by bringing together similar meanings from different scholars with a view of shedding some light on its importance and use in research. It is argued that the application of ideas like this generates the highly impacting research (Tamene, 2016).

3.1 Method used to design the framework

As a starting point for examining and understanding the concept of SoCeL, a literature review was undertaken. Initially, the review was conducted between September 2013 and March 2014 but later on, further reviews were conducted during data analysis and thesis write up.

In addition to Google Scholar searches, specialized database sources such as Web of Science, ScienceDirect, and ERIC were regularly used to systematically search for literature to provide empirical and conceptual insight into the SoCeL concept. Search words and phrases included, but not limited to: e-learning, learning theories, informal learning, social networking, learning management systems, higher education, social media, social media in education, Web 2.0, collaborative learning, personal learning environment, personal learning network, learning methods and interactive learning.

The 'snowball'(Biernacki and Waldorf, 1981) method of using the most recent works to find relevant articles cited in them provided additional articles. The aim was to find as many

articles as possible that relate to SoCeL and to gain a deeper understanding of the concept. The 'snowball' method of sampling has been used in other related studies (Tess, 2013; Kuss and Griffiths, 2011; Sim and Hew, 2010; Conole and Alevizou, 2010; Andersson and Grönlund, 2009; Sefton-Green, 2004) and it has proved essential for this study.

The literature review, which followed the guidelines set by Creswell (2003), was helpful largely in coming up with the three key concepts that were used to form the central concept, SoCeL as illustrated in Figure 3.1. The aim of the literature review in this case was to summarise the existing state of knowledge concerning SoCeL and to highlight the important gaps left by research and to make it easy to identify areas which should be focused on. This is in line with the guidelines of review set up by Creswell and which have been used in a similar study by Sim and Hew (2010) . Theoretical analysis of issues and phenomena arising from empirical investigations and existing theories helped to map out areas of investigation whilst providing the research focus; also setting directions for further inquiries within this domain.

3.2 Overview of the conceptual framework

There are three key concepts in this framework namely: informal learning, social networking and learning management. The relationships as illustrated in the Figure 3.1 place all these three concepts within the perspective of higher education which defines the scope of this research.
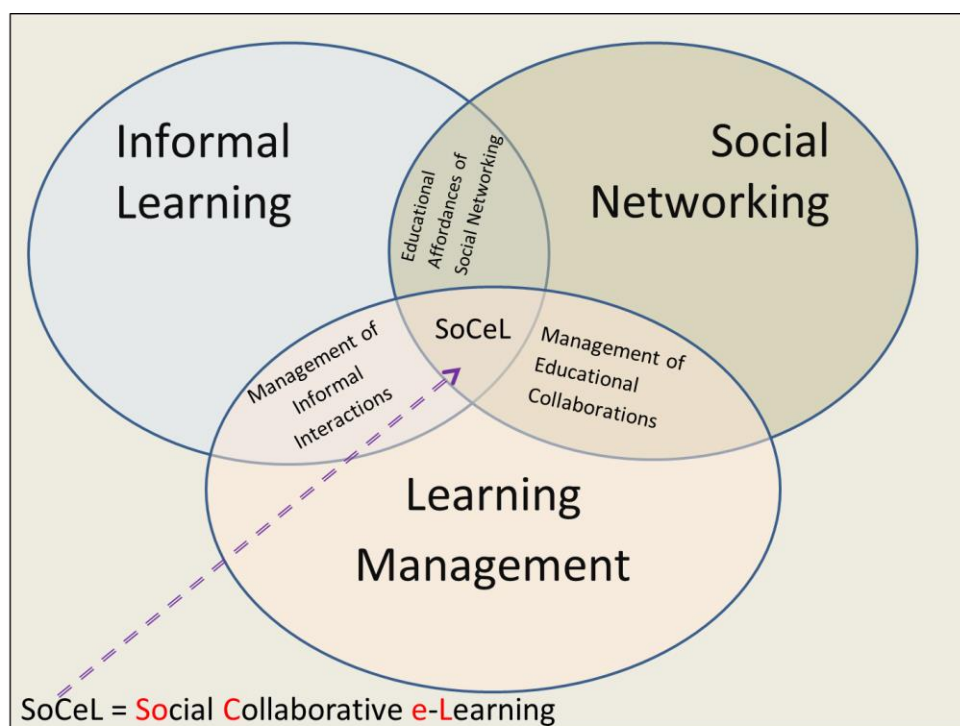
Figure 3.1 The conceptual framework for social collaborative e-learning

The point of intersection of the areas indicated by these three key concepts represents the central research concept – SoCeL – which, is the theme of this PhD research.

Some theoretical analyses have been made to connect these concepts and act as an aid in setting the research questions and objectives that guided in finding where to focus the research attention. The aim of the research was to improve effectiveness of integration of SoCeL at a university level education, especially in developing countries. The following sections provide analyses that have been made to connect these concepts and basis for the research questions arising from these discussions.

3.3 Informal learning

In this framework, informal learning is used to reflect on the culture of learning that is required to support the success of SoCeL through deliberate design that integrates informal learning into formal study programmes. This way, informal learning activities using available social collaborative technologies are provided for and evaluated to formally contribute towards the achievement of educational goals.

3.3.1 Implicit and explicit learning

Informal learning is regarded by the European Commission as unstructured (in terms of learning objectives, learning time or learning support) and typically does not lead to certification. This may be intentional but in most cases it is non-intentional or 'incidental' (The EC, 2010) but it results from daily life activities related to study, family or leisure.

Informal learning can occur implicitly – that is, independently of conscious attempts to learn and in the absence of explicit knowledge about what was learned (Williams, 2016) or it can occur as a result of some conscious attempts to learn (Reber, 1993) motivated by some learning element such as gamification, which allows learners to compete with themselves or others, and to know how close they are to accomplishing a goal and acquiring its accompanying reputation (Gibson et al., 2015). Eraut's (2000) argument however suggests that awareness of explicit learning does not necessarily exclude the possibility of implicit learning occurring simultaneously, and consequently most learning from experience has some implicit aspects. This often occurs outside formal education or training settings and is usually unplanned.

Explicit learning was categorised by Eraut into two distinct types: reactive or opportunistic learning (near-spontaneous) and deliberative learning (more considered). Eraut used the term 'reactive learning' to show that although this is intentional, it occurs in the middle of the action, when there is little time to think. Tough's (1971) view however, is that deliberative learning includes both 'deliberate' learning and engagement in deliberative activities. Deliberate learning is where there is a definite learning goal and time is set aside for acquiring new knowledge. Whilst deliberative activities include planning and problem solving for which there is a clear work-based goal with learning as a probable by-product. Because most of these activities are a normal part of daily life, they are rarely regarded as learning activities, even though important learning often occurs.

From Eraut's (2000) typology of informal learning and Tough's view on deliberate and timely learning activities, what appears as a gap in the body of knowledge is how to design an environment in which informal learning activities are provided for and recognised as part of achievement of the formal educational goal.

A study by Jeffs and Smith (1999) made more clarification in this area of informal learning. It focuses on how informal educational activities provide a spontaneous process of helping people to learn. Informal education, as they suggest, works through conversation, and the exploration and enlargement of experience. As they observe, learning is about 'thinking' and 'understanding' and this occurs all the time as we go about our lives and try to makes

sense of the world around us. Therefore, in order to stimulate informal learning, the role of the lecturers should be seeking to create a 'forked road', to encourage students to explore what is going on. The term 'forked road' was used by John Dewey (1933) to describe a situation that is ambiguous or challenging and that presents a dilemma and proposes alternatives. In this regards, Jeff's and Smith's suggestion means that lecturers can achieve 'forked road' by asking questions and engaging in conversations that challenge the 'accepted'.

However, there is little in the literature to suggest that in higher education, lecturers provide adequate time or activities to enable the creation of 'forked road' situation that support informal learning among their students. A few authors who explore this topic argue that because of lack of framework to reward lecturers for their efforts towards adopting informal learning strategies are not effectively rewarded. It is down to the institution to come up with a policy framework that encourages lecturers to adopt these kinds of learning strategies.

When students are helped to engage in dialogues about the past, present or future events, they may better understand themselves, the situation they encounter and what they can do –and that is an important element of informal learning and in building a cooperative classroom (Gillies, 2015). In psychology, understanding may be referred to as comprehension, which may be defined as the opposite of confusion (Jeffs and Smith, 1999). This is when we are able to make sense of what is going on. In order to establish effective informal learning environment, it is important to understand the dimensions of informal learning as presented in the following section.

3.3.2 Dimensions of informal learning

As illustrated in Table 3.1, Eraut (2000) defined two dimensions within the informal learning domain from which we extract the learning informal learning scenarios for discussion in the next section.

Table 3.1 A typology of informal learning adapted from Eraut (2000)

Time of stimulus	Implicit learning	Reactive learning	Deliberative learning
Past episode(s)	Implicit linkage of past memories with current	Brief near-spontaneous reflection on past episodes,	Review of past actions, communications, events' experiences. More

Time of stimulus	Implicit learning	Reactive learning	Deliberative learning
	experience	communications, events, experiences.	systematic reflection.
Current experience	A selection from experience enters the memory.	Incidental noting of facts, opinions, impressions, ideas. Recognition of learning opportunities.	Engagement in decision making, problem solving, planned informal learning.
Future behaviour	Unconscious effect of previous experiences.	Being prepared for emergent learning opportunities.	Planned learning goals. Planned learning opportunities.

The first dimension Michael Eraut introduced is *level of intension to learn* which to him presents a range of learning phenomena from *implicit learning* at one extreme ('bottom-top' process); the *deliberative learning* at the other extreme ('top-bottom' process) and the *reactive learning* in between.

Reber (1993) defines implicit learning as learning in which the acquisition of knowledge is independent of conscious attempts to learn and is in the absence of explicit knowledge about what is learned- there being no intention to learn and no awareness of learning at the time it takes place. Implicit learning is therefore non-episodic learning of complex information in an incidental manner, without awareness of what has been learned. Seger (1994) adds that it may require a certain minimal amount of *attention* and may depend on *attentional* and working memory mechanisms. Reactive learning is near-spontaneous and unplanned, the student is aware of it but the level of intentionality will vary and often be debatable. Its articulation in explicit form could also be difficult without setting aside time for more reflection and thus becoming deliberative (Eraut, 2000). Deliberative learning is when learning appeals to the student whereby a time is specifically set aside for that purpose. In other words, it is when one decides if it is worth its while to learn something.

The second dimension is the timing of the events providing the focus for the learning. These events can be from the past, something happening in the present or part of some possible future action. Eraut (2000) combined the two dimensions time of local event and level of intention to construct a typology of non-formal learning (Table 3.1) from which this thesis draws the informal learning strategies discussed in the next section.

3.3.3 Integrating informal learning and formal learning

It is noted by Jeffs and Smith (1999, P.17) that "by setting informal against education we run the risk of not seeing the shared concern of learning". This means that it is a mistake if we disconnect them. Since the two have the common goal to help students 'grow', this research adopted the integration approach in order the leverage the advantages of both modes given the central theme of this thesis which focuses on integration learning technology.

This approach is informed by the works of various authors in the field of informal learning. The model suggested in this thesis (Figure 3.2) is grounded on the hypothesis that both informal and formal approaches to learning are reinforcing (support each other). 'Informal lecturer' will at times adopt formal methods. They may teach around a curriculum, organise and manage groups and activities. Equally, lecturers may have informal times as well as their formal ones (Jeffs and Smith, 1999). The choice of how the mix can work is best determined by the educator. The strategies suggested in the model in Figure 3.2 represent what could guide in providing informal learning environment as a scaffold for formal educational programme.
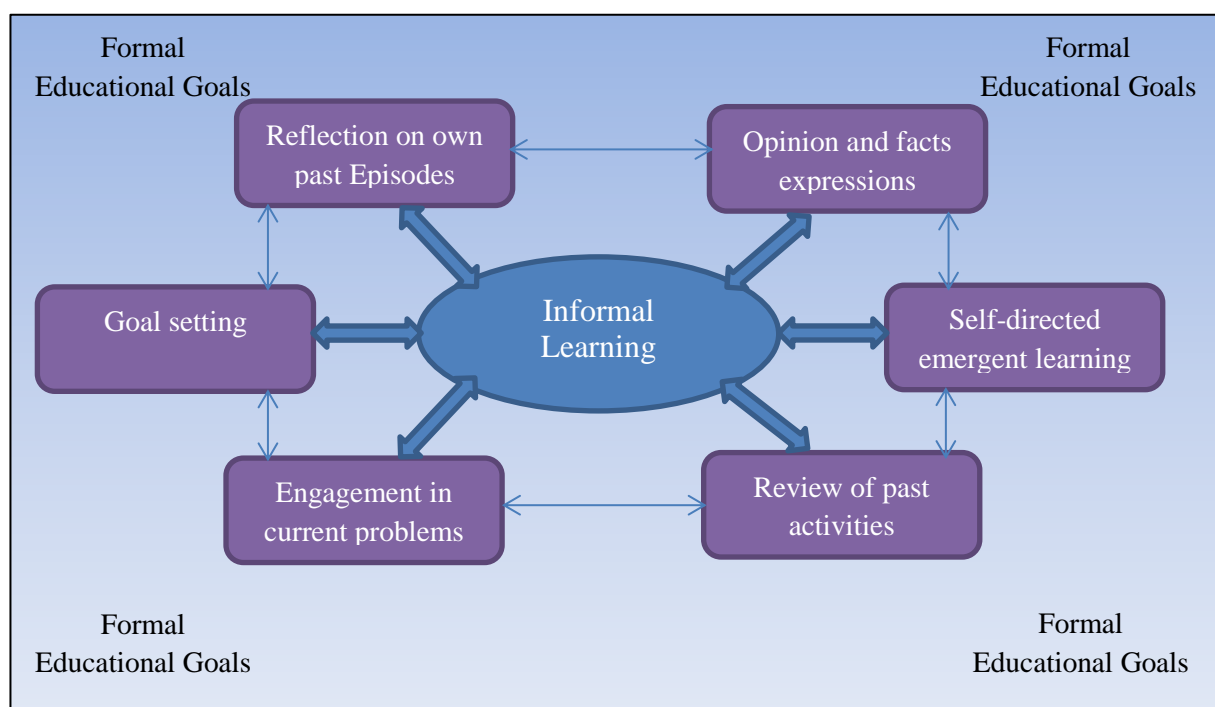
Figure 3.2 Informal learning within formal programme (Otto and Williams, 2014b)

Informal learning takes place anywhere including inside and outside of formal and non-formal educational institutions. However, the main discussion in this thesis is centred on

how the lecturer can help in establishing an environment that stimulates informal learning among students and that these activities can be formally designed and managed an eventually become part of the class culture (see section 2.5.1).

A recent *NMC Horizon Report* (Johnson et al., 2015) also lists blending formal and informal learning as one of the key sociable challenges facing higher education today. And in that report it is noted that the challenge is mainly due to the lack of ways of acknowledging the qualified learning that happens beyond the classroom. This challenge may be attributed to a lack of well-developed mechanisms to manage informal learning (see also 2.5.1). This is why the approach in this study is focusing on management of the integrated learning contexts as illustrated in Figure 3.2.

The typology in Table 3.1 (on page 62) highlights nine scenarios in which Eraut (2000) show how informal learning takes place. These nine scenarios result from applying time of stimulus on level of 'intention to learn'. Three times of stimulus can be: 'past episode', present episode and future episode. The level of intention can be categorised as: implicit learning, reactive learning and deliberative learning. The nine scenarios result from applying each of the stimuli across each of the levels of learning intention.

By removing the 'implicit learning' level, the three levels of stimulus are applied to two levels of learning intention, resulting in six scenarios (listed below), which are used in this thesis as strategies for effective 'measurable' informal learning in support of carefully designed formal learning programme. Since the focus of this thesis is on the integration and management of informal learning, the scenarios adopted should be manageable. For this reason, completely implicit scenarios were not considered. The following are the six scenarios used to design the integrated learning environment in Figure 3.2:

a) Reflection on own past episodes
b) Opinion and facts expressions
c) Self-directed emergent learning
d) Review of past activities
e) Engagement in current problems
f) Goal setting

The following paragraphs explain the six scenarios in further detail:

a) *Reflection on own past episodes***:** Near-spontaneous reflection on the past episodes and communicating events and experiences as noted in (Eraut, 2000) as reactive learning

provides essential knowledge that can be utilized for one's formal learning. This is specifically important in reactive decision making situation especially in case of an emergency other than a normal decision making process. A normal decision making process follows steps including defining the problem, collecting necessary information, developing options, devising a plan, executing and making following-up. However, when an emergency situation occurs in a similar way to the past episode, it becomes easy to make a correct reactive decision basing on reflection on own past episodes.

b) *Opinion and facts expressions***:** Incidental noting of facts, ideas and expression of learning the opportunities also describe reactive learning using current stimulus. When students are given opportunity to express their opinion on an object which has close links to the main subject of study, the scope of the learning opportunities can be developed. Allowing students to freely express their opinion about any learning experience or material certainly promotes learning. When students sure that their opinions are not censured by people in authority over them, they are highly encouraged to interact with their peers and express their opinion.

c) *Self-directed emergent learning***:** Megginson (1996) used the term *emergent* to describe an alternative strategy to planning. Emergent learning strategy is focused on learning through experience to continually and effectively get ready to seize learning opportunities. Most self-directed emergent strategy students start the learning process with just an idea of the outcome they want and progress as more opportunities avail. This strategy was illustrated in (1994) using Tough's (1971) concept of *learning* project (an extended piece of learning with a particular idea in mind) whereby less than 20% of their respondents claimed to have unequivocally followed a pre-determined plan. 80% per cent had an idea of the outcome they wanted, but followed an emergent strategy which took advantage of learning opportunities as they arose. What is important here is that allowing students to have exploratory facilities will aid them in self-directed learning.

d) *Review of past activities:* Review of past actions, communications, events and experiences demonstrates deliberative learning from past episodes. Activities such as story-telling and experience sharing can provide a very supportive environment for informal learning. This scenario can be carefully managed through experiential learning activities. Learning that took place in the past can be reviewed to give experience needed for present and future learning.

e) *Engagement in current problems:* Engagement with an aim of problem solving and decision making can promote informal learning. With the increased use of interactive media in education the focus of the lecturers is more in engaging students, promoting independence and challenging students. This can be done in a number of ways including: Using a wide range of tasks and resources, encouraging independent and small group research, allow presentation of results and encouraging different approaches to problem solving and judgment.

f) *Goal setting:* Planned learning goals and planned learning opportunities are commandingly used in facilitating deliberative learning for future achievements. For example, a lecturer giving an assignment for the students to learn how to cook a particular recipe. This task could generate goals that can guide the learning in the future and make it easy to assess performance.

3.3.4 Being an informal lecturer

To properly understand the role of an informal lecturer we need to understand the role of a lecturer in the context of education. Different authors have different views about education and the role of a lecturer. The purpose of a lecturer's job is to facilitate learning and to encourage the students to learn more effectively (Kharb et al., 2013). This means that a lecturer helps in imparting general knowledge, developing the powers of reasoning and judgment, and generally of preparing students intellectually –to make them learn. Therefore, the students' learning should be the main concern of a lecturer.

This is also in line with definition of education given by Jeffs and Smith (1999) in terms of activities that are intended to stimulate thinking, to foster learning. Although some define education in terms of theory and practice of teaching (which is the job of a lecturer), Nyerere (1978) summarised the purpose of education as being liberation of human from the restraints and limitations of ignorance and dependency. He emphasised that teaching is not education but rather it induces a slave mentality or a sense of importance and it is an 'attack on the minds' on men.

This thesis emphasises the provision of an informal environment and activities that promote learning. Dewey (1916, p.16) made the point "that we are unable to plug directly into another person's brain." This is why environment is emphasised when we talk about education or learning. To adopt the model proposed in Figure 3.2, the role of lecturers should therefore cover a wider perspective than teaching and this should involve intention (to set

formal goals), environment (informal learning strategies) and commitment (actively involved in the environment). They should be able to offer choice not compulsion; freedom not order; empowerment not indoctrination and should spend time (outside class time) to interact with the students. Their roles, according to the above arguments, should be less as policing and more as developing relationships; engaging in conversations and introducing more brain stimulating topics whilst making it part of the culture of the students.

3.3.5 Summary

There has been enormous effort towards recognition of informal learning as a means through which one can gain acceptance into the higher education and as an approach that can be integrated into the formal learning process. Previous studies (Johnson et al., 2015; Malcolm et al., 2003a) have concentrated on blending informal and formal learning modes; and it has been shown that informal and formal modes of learning work hand in hand to support development of learning environments and to improve learning (Jeffs and Smith, 1999). However, the gap that still exists is how to have qualified learning that happens beyond the classroom acknowledged, integrated, and managed within the formal system.

3.4 Social Networking

In this framework, the concept of social networking, which is central to many Web 2.0 technologies, has been used as a basis of interactions and collaboration within the SoCeL environment. According to Eysenbach (2008), this term is used to describe the explicit modelling of connections between people, forming a complex network of relations, which in turn enables and facilitates collaboration and collaborative filtering processes.

This framework emphasises the role of social networking in fostering informal and formal learning. With strong emphasis, educational affordance of social networking is discussed.

3.4.1 The role of social networking

As Poore (2013) argues, the traditional Internet made it difficult to fully socialise; it did not give users the ability to interact in real time with friends, family, colleagues, and strangers the way it is done using Facebook or Skype. This is because the traditional Web only supported reading information provided on websites. However, with the coming of this 'social' Web (the Web 2.0), many social networking services and applications have sprung up giving users

more powers not only to interact with others – that is, social networking, but to be able to author content. Today, users are in more control of the Internet than ever before as they are able to create and disseminate contents to their friends (Pempek et al., 2009). Interestingly futurists are already looking into evolution of Web 3.0 in education. According to Victor and Mohammed (2016, p.212), the current version of Web is evolving into 'Web 3.0', consists of "a more interactive and dynamic interface with highly advanced features that empower machines to 'think' and 'execute' tasks, providing them with interpretation and analysing skills in order to suit the needs of the user". However, the current social collaborative technologies commonly used by students and lecturers are examples of Web 2.0.

Social networking technologies were initially designed to facilitate social interactions among users (Roblyer et al., 2010). They were not designed with any educational purpose in mind as there was learning management system for that purpose. However, because of the opportunities they provide especially in fostering informal learning through social interactions, students and lecturers use them to support their educational needs. This is why affordance of social networking is important in regards to SoCeL. Social networking enables users to see what their peers or 'friends' are doing and they can communicate and share resources or work collaboratively (Eysenbach, 2008) although this may also reinforce bad behaviour and other privacy/security issues as pointed out by (Otto et al., 2016).

3.4.2 Defining educational affordance of social networking tools

Gibson (1977) was influential in establishing *affordance theory* which states that the world is perceived not only in terms of object shapes and spatial relationships but also in terms of object possibilities for action (affordances) — perception drives action. The concept of affordances has been used to study the usage and design implications of artifacts and communication technologies for example, (Gaver, 1991; Gaver, 1992; Norman, 1990).

Affordances of an object are therefore attributes of objects, its environments and actors. For example, people view a brick as a piece of rock, which of course does not move. But looking at this seemingly obvious definition basing on Gibson's theory, it can be intuitively perceived that the brick or its environments with respect to its functionality for action, at the same time, this brick and its environments also contain perceptual information that indicates the potential actions it affords as suggested by Bloomfield et al. (2010).

In this case the affordances perceived and enacted in a certain situation by a given person are relatively dependent on the knowledge, skills and agency that person has acquired in her past experiences (Dohn, 2009). Using our example of the brick, it can also be said that a brick affords a builder the opportunity to use it as a material for constructing a house while it affords a naughty child a playing object which he or she can throw onto a glass window.

Talking about educational affordances of social networking tools therefore, we need to understand in terms of Gibson's theory the links between (social networking) technologies as 'objects', student (interactions and networking) as 'actions' and socio-educational structure as 'environments'. It can be recognized that social networking sites have an empowering potential for educational interaction as the educational affordances of social networking technology can enhance users' local and global connectivity and provide users an additional means for educational interaction.

Understanding that technology and educational contexts are mutually shaped is important in that an environment for which educational affordances are being defined can be achievable. This study argues that educational affordances of social networking sites can be defined (illustrated in Figure 3.3) as:

Abilities of a student to utilize social networking technologies capabilities for specific learning activity within socio-educational environment
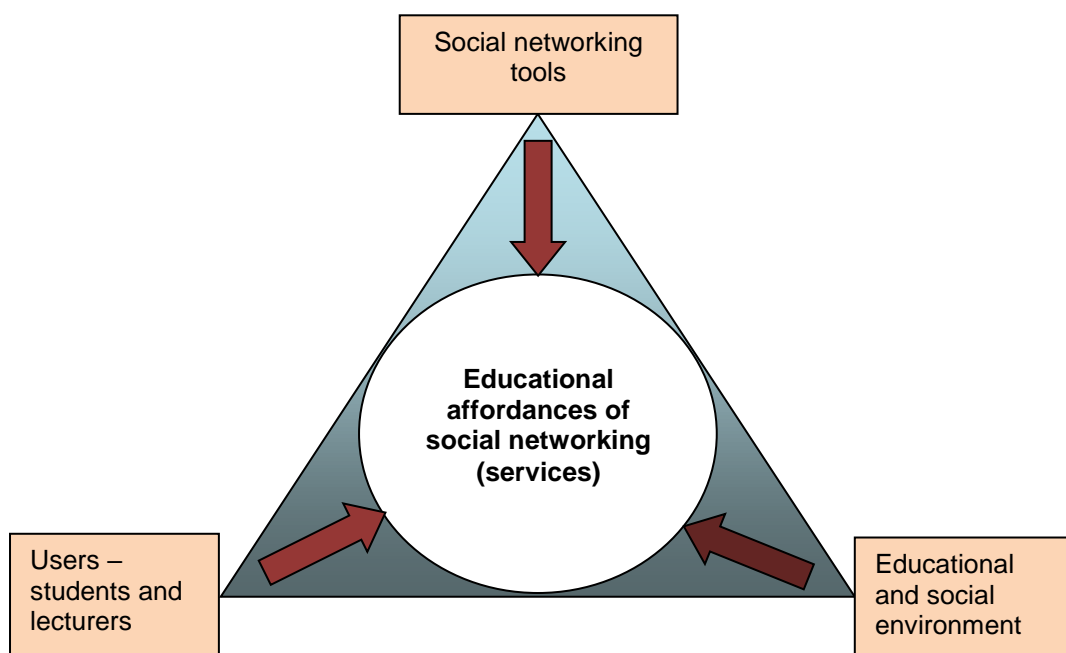
Figure 3.3 Educational affordances of social networking (Otto et al., 2015)

This means that the properties of social networking services will enable or constrain educational activities depending on the educational environment and social norms in different situations in which users operate. There are other factors that may influence the affordances of social networking sites and discussed in the next section.

3.4.3 Typology of educational affordances of social networking

The educational affordances offered by SNSs are categorised in to three perspectives namely: a) pedagogical, b) social, and c) technological affordances (Idris and Wang, 2009). The significance of the social affordance is normally overemphasised but this thesis argues that all the three perspectives are significant for effective integration of social networking tools into educational system.

a) Pedagogical affordances relate to: innovative learning approaches, motivates students' participation, present multimedia materials and enables students' reflections.

b) Social affordances regard interaction in different scopes (such as peer-to-peer, small group and whole class) and communication in different formats (asynchronous and synchronous).

c) Technological affordances provide open and customisable environment for users to interact and collaborate.

An educational environment is a socio-cultural system in which users (students and lecturers) engage using various tools and forms of interaction to create collective and collaborative activities, supported by technology affordances (McLoughlin and Lee, 2007). The users in this environment are motivated by various factors (referred here as purpose for action). The following are five broad categories of purpose for action of users when they choose to engage in social networking tools: networking, creating, modifying, aggregating, and lurking. The services provided to users whilst they engage in the social networking tools offer possibilities for action (affordances) in pedagogical, social, and technological perspectives.

The typology presented in Table 3.2 distinguishes between three perspectives of educational affordances of social networking sites whilst listing possible activities and tools supporting the five categories of purpose for usage of social networking tools.

Other attempts have been made to categorize usage of social networking tools. For instance, a study by Cheung et al. (2011) explored the factors that drive students to use online social networking tools; Cheung et al. conceptualized the use of online social networking tools as intentional social action and investigated the 'We-Intention' to use online Facebook. The

'We-Intention' used in that study focuses on the presence of 'we' together in making an intention about using online social networking tools in the future. This concept places the collective decision at the heart of participation in social networking although online participation may be categorised and vary according to different individual's purpose of joining the online network.

Li (2007) categorized usage of social tools using a ladder of levels of a participation. Li's six levels of a participation in social tools are: creators, critics, collectors, joiners, spectators, and inactives. Li's emphasis is on the level of participation but the typology developed in this paper uses matrix classification based on purpose of use and the perspective of affordance.

Table 3.2 A typology of educational affordances of social networking (Otto et al., 2015)

Purpose of use	*Pedagogical affordances*	*Social affordances*	*Technological affordances*
Networking	Informal learning; reaching out; communication and engagement; sharing experiences and reflections	Identity seeking; social rapport - appreciating members, activities, and contents; and connecting socially	Comments, like & Share buttons; friend request; profile editing tools; digital literacies; status updates
Creating	Publishing page, course content, slides, games and other materials; creating educational and research activities; asking questions; setting polls; creating topics for discussion	Setting social events, group activities, setting group meeting; inviting members to join activities, or event; uploading contents	Tools to create Web-based activities, event, and content; open source and tools for creating text, audio and video; webinars
Modifying	Giving response/ feedback; editing and reformulating learning content	Participating in discussion forum; critiquing views; posting reviews; commenting	Group chat; discussion forum; RSS, podcasting, and vodcasting; syndication; open editing; and review structure
Aggregating	Organizing references to learning materials, sites, and contents; adding links of networking profile; saving Tweets to favourites	Sharing links and Tweets	Subscribing; liking; sharing; aggregation of text, audio, and video content
Lurking	Subscribing to the tags of others, reading, listening, and watching contents	'Liking' and tagging; reading updates and other users' posts	Tagging tools; media players

3.5 Learning management

Managing of formal online learning has been made possible through the learning management systems (LMS). LMS are Web-based systems that handle all aspects of the learning process (Watson and Watson, 2007), allowing lecturers and students to share

materials, submit and return assignments, and communicate online. The majority of higher education institutions have established one or more LMS-type products for student and lecturers use (Lonn and Teasley, 2009). Although the traditional LMS are used for the distribution, management and retrieval of course materials, today attempts are being made to enable these systems to incorporate more functionalities. For instance, Marks et al. (2016) report that universities are attempting to make better use of new analytics functions and the data stored in the university LMS in order to make more informed decisions regarding short-term and long term goals and objectives.

Other researchers (such as Tobarra et al., 2016) are focusing on integrating laboratories as a service into LMS while others like (Hori et al., 2015) are moving towards fusing of e-textbooks, LMS, and social networking tools diversified learning environment. All these demonstrate how current research efforts are contributing to the evolution of LMS from the traditional e-learning approach to the 'next-generation' e-learning approach (Lytras et al., 2015) that supports more functionalities including improved social interaction and collaboration between students and lecturers and among students themselves in order to provide SoCeL.

3.5.1 The traditional learning management systems

The use of LMS especially for administrative purposes remains significant in e-learning provision. However, the characteristics of the traditional LMS are derived from the nature of earlier Web - Web 1.0 (Poore, 2013) - which largely support transmission-style educational practices –what can be referred to as 'downward' communication– and have the limitations in offering standardized education for diversified students with different skills, objectives, abilities, preferences, and backgrounds (Hori et al., 2015).

Downward communication is one in which learning material is posted, usually through e-mail, and students are able to view it or download it, but it is asynchronous in nature, hence supporting limited instructional interaction (Oztok et al., 2013; Giesbers et al., 2014). Asynchronous e-learning occurs in delayed time and does not require the simultaneous participation of students and lecturer, learning events are independently experienced by students and learning is not synchronized in time or space (Johnson, 2006).

Poore (2013, p.5) refers to this as "industrial practice, characterised by mass production and economies of scale to replicate the old-fashion educational routines based around the notion of the monolithic student". She adds that the reason to have such systems in education

is to ensure speed and orderliness in curriculum execution, control of the student's activities, but generally it is due to lack of trust in the competence of the students to make learning decisions.

This system however, has become contrary to the vision of today's students who desire to be in control of what they want to learn –they need to engage peers and lecturers (Seaman and Tinti-Kane, 2013). The modern student knows that information is everywhere; wants to participate, create contents; collaborate with their peers, interact, communicate, build community, share information, network with others and personalise their space. A recent study by Prestridge (2014) showed that student-initiated interaction supported by lecturer's use of participatory pedagogies enables substantive dialogue through social collaborative technologies.

For the LMS to suitably meet the requirements of today's students, new features provided by social collaborative technologies should be integrated. This is in line with the vision of the next generation LMS (Lytras et al., 2015) and as earlier claimed by Poore (2013, p.6), many higher educational institutions have moved on to support a more social collaborative form of learning since there is much confidence in the educational affordance of social networking tools to free themselves from the constraints of transmission teaching.

This research explores what kind of features students and lecturers would like to have in the next generation of LMS. The next section is dedicated to explore this concept and set basis for development of SoCeL integration framework.

3.5.2 Next generation LMS

Organisation for Economic Co-operation and Development (OECD) report indicates that universities primarily use LMS for administrative purposes, and that LMS so far have had a limited impact on pedagogy:

> ICT has penetrated tertiary education, but has had more impact on administrative services (e.g. admissions, registration, fee payment, purchasing) than on the pedagogic fundamentals of the classroom (OECD, 2005, p.15).

This limitation is magnified with the advent of social networking tools. Various studies (Paul et al., 2012; Junco, 2012a; Nadkarni and Hofmann, 2012) show that students spend longer time engaging in online social interactions than in doing class related work even if they are

made available online. One of the reasons could be that LMS do not provide support for social interactions and collaboration although efforts have been made to ensure students are engaged anyway. This has drawn the attention of educators and researchers to consider improving the current LMS to match the requirements of today's students. A report on higher education by the New Media Consortium highlights that the need for integration is one of the driving forces dominating higher education e-learning field:

> integration of online, hybrid, and collaborative learning as being one of the key trends driving changes in higher education over the next few years in that 'education paradigms are shifting to include more online learning, blended and hybrid learning, and collaborative models. Students already spend much of their free time online, learning and exchanging new information. (Johnson et al., 2014, p.2)

However, with the traditional LMS (without embedded Web 2.0 tools), students are not engaged in an active use of the Web as a resource for their self-governed, problem-based and collaborative activities as argued by Christian Dalsgaard (2006), adding that that previous LMS platforms did not support a social constructivist approach which emphasizes self-governed learning activities of students.

This research sought to investigate the learning experience on existing LMS platforms, perceptions and the readiness for next generation LMS (and suitability for higher education in developing countries). The approach adopted in this research was (a social constructivist approach of) integrating social networking features into current LMS in order to achieve the objective of next generation. It is important to consider and integrated approach is adopting a learning environment that empowers students, offering them tools for independent work, reflection, construction and collaboration whilst facilitating students' engagement in social networking to support e-learning activities.

However, since social networking tools are not developed for educational purposes, an effort to design an environment that integrates LMS and social networking tools to support learning activities is necessary and should be guided by theoretical frameworks. The next chapter presents the methodology adopted for in this research.

Chapter 4

Research Methodology

This chapter presents the research design, methods and techniques adopted in carrying out this study, collecting, and preparing data to support the thesis. The design approach and the methods and techniques adopted in answering the research (question introduced in section 1.3) is discussed in this chapter. This study explores the skills, perception, experience, and behaviour of students and lecturers in response to the emerging social collaborative approach to e-learning whilst focusing on a university level education from the developing countries' perspective.

4.1 Philosophical dimensions

According to Kalof et al. (2008), the two main philosophical dimensions to distinguish existing research paradigms are ontology and epistemology; they relate to the nature of knowledge and the development of that knowledge, respectively (Wahyuni, 2012). Ontology is the view of how one perceives reality. It is concerned about what kinds of things exist such as working models of entities and the way they interact within a particular knowledge domain. Whereas epistemology relates to methods, validity, and scope of knowledge – what Wahyuni (2012) describes as 'the beliefs on the way to generate, understand and use the knowledge that are deemed to be acceptable and valid. The following sections explain the philosophical assumptions in this research and the rationale to support them.

4.1.1 Ontological assumption

Ontologically one can perceive that the existence of reality is external and independent of social actors and their interpretations of it, termed objectivism – that social reality is external and objective (positivism) (Vrasidas, 2000) – or   realism (postpostivism), especially in relation to studying human behaviour in social science resulting in generalisation, but holding that knowledge is a result of social conditioning (Wahyuni, 2012). On the other hand, one can perceive that the existence of reality is dependent of social actors and their interpretations of

it, termed subjectivism (constructivism). This means that social reality does not separate the researcher from the researched (Vrasidas, 2000). Subjectivist theory believes that reality is dependent on social actors and assumes that individuals contribute to social phenomena. These are also known as constructivists, who subscribe to what is called constructivism, or the belief that reality is constructed by social actors and people's perceptions of it contribute to the on-going construction of reality existing in their broader social context through social interaction. They therefore recognise that individuals with their own varied backgrounds, assumptions and experiences contribute to construction of reality (Wahyuni, 2012).

The ontological belief in this research is subjectivism, the view of reality as a socially constructed reality (constructivist paradigm), holding that reality may change and exists in multiple instances requiring a subjective approach to establish it. Hence the justification for a diversity of methods adopted in this research. Constructivism opposes the objectivist philosophy that human can come to discover the truth about the natural world by carrying out the right kind of experiments and processes (Wisker, 2008). According to constructivists, reality is in process and can be understood in context. This research is highly contextual especially in terms of locality and people involved.

This research is focused on the effects of technology on people, perception on the technology use, as well as behavioural change as a result of using technology. Therefore, the reality that this research seeks to discover exists in multiple instances and in contexts in which it was conducted. This is therefore a subjectivist research which assumes that "world is indefinable, interpreted, shifting in meaning based on who, when and why anyone carries out and adds the meaning" (Wisker, 2008, p.66). For this reason, this study adopts the use of research questions through which data were collected analysed and interpreted within the focus defined in the research context.

The methods applied in this research aimed at collecting data that were interpreted in the contexts that were relevant to higher education in developing countries. The knowledge and understanding expected was through making links, interpreting contexts and perceiving. This inductive research also assumed that the understanding of the meaning that were determined from the findings produced by this research can be differently interpreted in different times and places by different people. Therefore, a more qualitative approach was adopted although some data were quantitative in nature were used to explain or substantiate the qualitative interpretations.

4.1.2 Epistemological viewpoint

The epistemological position of this research is interpretivitism. This research recognises the importance of value and context, setting and the participants' frames of reference. This is why the Requirements Engineering approach using human – computer interaction ethnography (HCIE) methods were selected in order to determine what solution would be most suitable in the context of study. The way in which the researcher and participants entered and communicated in the research field was a vital and influential element of this research process and its outcomes. Research that is conducted using qualitative methods acknowledges the existence and study of the interplay of multiple views and voices. It also allows for the construction of reality and knowledge to be mapped out. Yet, this knowledge cannot be understood without understanding the meaning that individuals attribute to that knowledge – their thoughts, feelings, beliefs and actions (Illingworth, 2006).

Interpretivism emphasizes the significance of subjectivity and context meaning. Willig (2013) asserts that research from a social-constructive perspective is concerned with identifying the various ways of constructing social reality that is available in a particular culture, to explore the contexts, circumstances and conditions of their use and trace their implications for human experience and social practice. These are grounds on which the choice of methods basing of social constructivism was made for this research. This research involved interpretation and relationships between people (students and lecturers) and technology (social collaborative technology).

4.2 Research type

Qualitative research uses a naturalistic approach that seeks to understand phenomena in context-specific settings, such as a real world setting, and where the researcher does influence or manipulate the phenomenon of interest to bias the findings without proper use of statistical procedures or other means of quantification (Golafshani, 2003).

This qualitative research was designed based on an interactive model of the research proposed by Maxwell (2012) and illustrated in Figure 4.1. A mixed method was used to understand the environment in which social collaborative technology was adopted in this study of two universities in Uganda. The use of mixed method for data collection and analysis is explained in section 4.3.2. The main research question is exploratory in nature but the subsidiary questions, which helped in answering the main questions, are categorised into two broad types, namely the descriptive and explanatory.
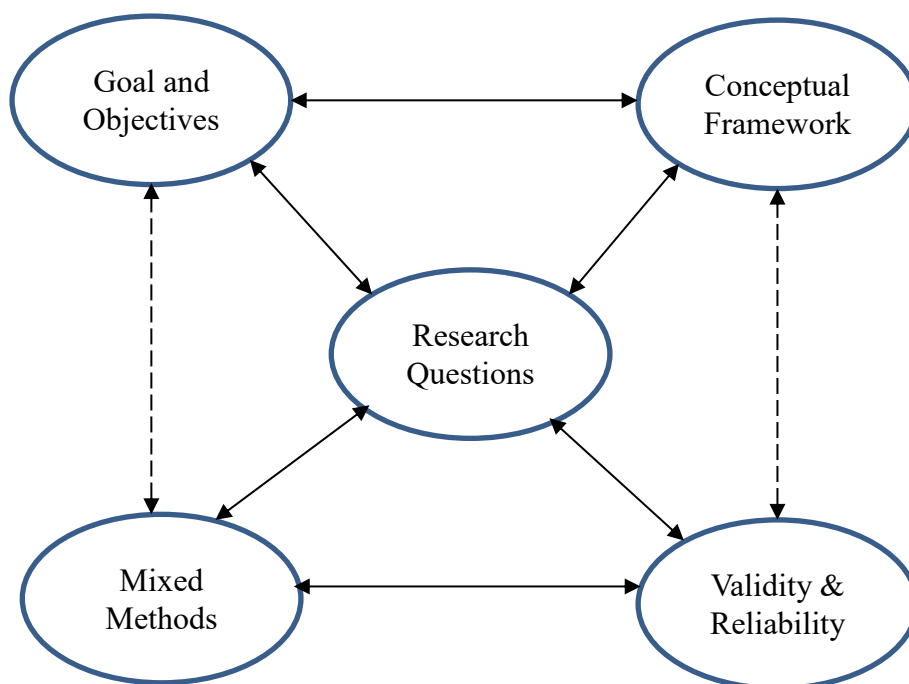
Figure 4.1 An interactive model of research design adapted from Maxwell (2012)

4.2.1 The main research question

The main research question (introduced in section 1.3) is:

How can social collaborative e-learning be effectively integrated in higher education?

This is an exploratory research in nature since it sought to examine the relatively new concept of SoCeL and its impact in the context of higher education in a developing country even though the concept relates to the trend witnessed in higher education worldwide. The choice of an exploratory question was made because exploratory research has the advantage of supporting both simple and complex issues that may contain both description and explanation. Therefore, the subsidiary research questions that were chosen for this research are of descriptive and explanatory nature as summarised in Table 4.1 (page 81).

4.2.2 Descriptive subsidiary research questions

Descriptive study helps in identifying and classifying elements of characteristics of the subjects of the study. Although some people dismiss descriptive research as `mere description', good description is fundamental to research and it has added immeasurably to our knowledge of the shape and nature of our society (Wisker, 2008). Descriptive questions are intended to find out more about a phenomenon and capture it with detailed information and can be repeated so as to provide further exploration (Wisker, 2008). Description can degenerate to mindless fact gathering or what is called 'abstracted empiricism' (Mills, 1959).

Table 4.1 Summary of initial research questions and information evidence required

No	Question	Evidence required
1	What are the perceptions and experience of lecturers on informal learning activities?	1. Age, gender, faculty, subject, social background, qualification, time spent online 2. Level of awareness, experience, attitude, behaviour, activities, expectation on (informal learning, social networking, e-learning)
2	What are the perceptions and experience of students and lecturers on the use of social networking tools for learning?	3. Access to facilities (PC, mobile, Internet) 4. Ideological considerations 5. The choice of social networking platform 6. Participants' experience, attitude, expectation on social networking of learning
3	What kind of LMS do students and lecturers consider suitable for their educational needs?	1. The usage pattern (user activities); 2. The social, educational and economic environment 3. Learning experience on the LMS 4. Expected features for the next generation LMS
4	How can social collaborative e-learning improve learning?	1. User satisfaction, perception, learning experience 2. Impact of the adoption social collaborative technologies 3. Perception on the social collaborative e-learning integration process 4. Factors to be considered for the adoption of social collaborative e-learning environment

Abstracted empiricism is the practice of gathering data without developing a theoretical framework that would give that data meaning and value. Survey questionnaire was therefore a key data collection tool to provide a means of collecting both quantitative and qualitative data that supported the description part of this research. This research employed the descriptive approach in order to come up with a detailed state of learning environment and practices, and the trend of adoption of technologies that support SoCeL given the absence of such data. This was particularly because descriptive questions provoke the `why' questions of

explanatory nature which emerged during the research process. The descriptive data were fundamental as a reference point and this is why the descriptive questions were first employed before the explanatory questions were used as the research progressed. It should be noted that using the explanatory questions as initial research questions would not be helpful before understanding the facts and dimensions of the phenomenon of the SoCeL integration in these higher education institutions.

In which case, this research used some quantitative techniques in collecting and analysing the data in the first stage of the research so as to give a strong basis to provide meaningful explanation (in the second and third stage) and hence generation of knowledge. For instance, the first objective of using the descriptive approach is to get to establish what practices, skills, perception, and behaviours of students and lecturers related to informal learning in their institutions. This knowledge provided the basis for further analysis to explain the trend in relation informal learning environment for students leading to the knowledge which informed the development of the integration framework. This was the case for the second and third initial research questions.

4.2.3 Explanatory subsidiary research questions

The choice of the explanatory type of research in this research was largely based on their characteristics and usefulness in supporting description. Explanatory research often extends the descriptive approach. An important feature of this type of research is locating and identifying the different factors (or variables) involved. Explanatory research focuses on 'why' questions. It is quite important to develop explanations about phenomena which are normally describable so as to provide a complete picture of knowledge.

Since this research was dealing with different subjects (such as people, technology, educational and social environment), identifying the attributes and their co-relations, was essential in generating knowledge by explanation. The main aspect of this research was explanation in which case Human-Computer Interaction Ethnographic tools were handy in collecting the mainly qualitative data that to provide the basis for explanation, subjective interpretation, and extending the meaning from the description.

The subsequent research questions and other issues that emerged during the study and were specifically explored have been presented and discussed in the results chapters (Chapter 5, Chapter 6 and Chapter 7)

4.3 Research methods

This section explains the methods chosen to conduct this study – the description and reason for selecting each of the methods adopted in this research.

4.3.1 Software engineering requirements

Software engineering is an engineering discipline that is concerned with all aspects of software production. Mills (1980) defines it as the systematic design and development of software products and the management of the software process. This includes the application of a systematic, disciplined, quantifiable approach to the development, operation, management, and maintenance of software. Software engineering is a relatively young discipline without much historic background having existed for only few decades (Lázaro and Marcos, 2005) and there is little literature on research methods in this field. This is a field in which expertise and the application happen in the field (Muller, 2013) and therefore research in it still lacks suitable scientific precision (Lázaro and Marcos, 2005).

Requirement engineering is the most effective phase of software engineering process. It aims to collect good requirements from stakeholders in the right way (Pandey et al., 2010) such as by empirical research. Empirical research methods in software engineering include experiments, surveys, case studies, and human-computer interaction ethnography (HCIE). Empirical methods are crucial, since they allow for incorporating human behaviour into the research approach taken (Wohlin et al., 2006). These methods are common practice in many other disciplines but from an engineering perspective, the main motivation for empirical research is that it is to allow for informed and well-grounded decision regarding the implementation and integration of the software (Wohlin et al., 2006).

Selecting a research method for empirical software engineering research is problematic because the benefits and challenges to using each method are not yet well catalogued (Easterbrook et al., 2008). The problem is magnified due to the fact that software engineering has not yet explicitly identified and explained in terms of either our research processes or the ways we recognize excellent work (Shaw, 2002). It is also the basis on which this research adopted a mixed method approach. Using a number of methods could help in that each of the objectives in the research is examined and the types of questions each best addresses is analysed (Easterbrook et al., 2008). This therefore boils down to the research design and examining the research questions and objectives.

This research is designed largely as a constructivist (inductive) approach in order to ensure that the evidence obtained in this study enables us to answer the main question unambiguously as possible.

How can social collaborative e-learning be effectively integrated in higher education?

Obtaining relevant evidence entails specifying the type of evidence needed to answer the research question. This is why the choice of constructivist research design approaches using two research methods – namely: Case Study and HCIE – was made. Although the approach supports majorly qualitative approach, using HCIE data collection methods, the Case study design provides support for quantitative data collection methods as well. Therefore, the research design type is not categorised either as qualitative or quantitative but rather a mixed method approach.

It is erroneous to equate a particular research design with either quantitative or qualitative methods. Yin (1993), a respected authority on case study design, has stressed the irrelevance of the quantitative/qualitative distinction for case studies. He points out that:

> a point of confusion . . . has been the unfortunate linking between the case study method and certain types of data collection * for example those focusing on qualitative methods, ethnography, or participant observation. People have thought that the case study method required them to embrace these data collection methods.... On the contrary, the method does not imply any particular form of data collection * which can be qualitative or quantitative. (Yin, 1993, p.32)

4.3.2 Mixed methods

Although this research is subjective (exploratory in nature) the design allowed for mixed methods of data collection to be adopted. Since the exploration involves both description and explanation. The qualitative methods were used to answer the explanatory questions. Meanwhile, the quantitative (mainly survey questionnaires) were be used to answer descriptive questions.

Marsh (1982) argues that quantitative surveys can provide information and explanations that are `adequate at the level of meaning'. While recognizing that survey

research has not always been good at tapping the subjective dimension of behaviour, she argues that:

> Making sense of social action . . . is . . . hard and surveys have not traditionally been very good at it. The earliest survey researchers started a tradition . . . of bringing the meaning from outside, either by making use of the researcher's stock of plausible explanations . . . or by bringing it from subsidiary in-depth interviews sprinkling quotes . . . liberally on the raw correlations derived from the survey. Survey research became much more exciting . . . when it began including meaningful dimensions in the study design. [This has been done in] two ways, firstly [by] asking the actor either for her reasons directly, or to supply information about the central values in her life around which we may assume she is orienting her life. [This] involves collecting a sufficiently complete picture of the context in which an actor finds herself that a team of outsiders may read off the meaningful dimensions. (Marsh, 1982, p.123-4)

Design Types	Case Studies: Case study 1 Case study 2 Case study 3	Human – Computer Interaction Ethnograph
Data Collection Methods	• Survey questionnaires • Focus groups • Semi-structured interviews	• Fly-on-the-wall Observation • Participant Observation • Key informant interviewing • Semi-structure interviewing
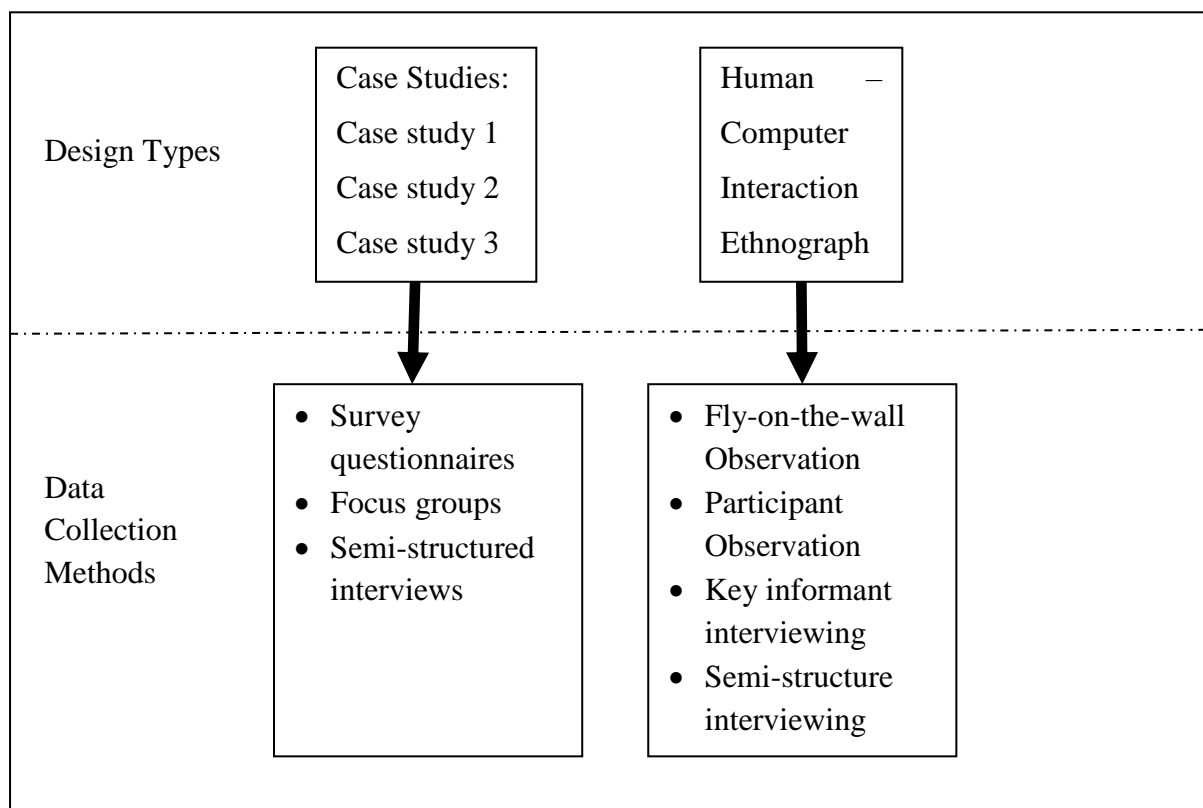
Figure 4.3 Relationship between research design and data collection methods

The use of the mixed methods approach adopted here is complementary and for triangulation purposes. The designs, in which qualitative and quantitative techniques are used, provide a

better understanding of the research problem than when either approach is used alone (Greene et al., 1989). Many researchers combine both quantitative and qualitative research methods and vehicles since the evidence sought in the research may contain that both qualitative and quantitative data. Mixed methods or multi-method research holds potential for rigorous, methodologically sound investigations (Creswell et al., 2004; Creswell, 2003).

4.3.3 Justification for choice of method

In this design, other research methods were not considered because of a number of reasons relating to the philosophical assumptions and the limitations. Since this study holds the constructivist ontology world view (subjectivist theory) that there are multiple possible realities constructed by different individuals, it became difficult to apply quantitative methods such as social surveys and experiments which are frequently viewed as prime methods of quantitative research that are based on numerical data which are analysed statistically. This study aimed at getting qualitative evidence that is majorly non-numerical data. Besides, quantitative designs are concerned with hypotheses testing while this research is concerned with theory construction.

Quantitative designs such as (self-contained) surveys normally use large samples which makes it logistically limiting. This is because quantitative research normally from sample to population. They produce data that are highly specific and precise yet this study is aimed at getting data that are rich and subjective. Sometimes quantitative methods produce data that are not valid. Since the aim of this research is to produce guidelines for effective integration of social collaborative technology as a tool to improve higher education, it was crucial that data used were reliable.

The preference of case study and HCI ethnography as an empirical qualitative research method over other qualitative methods is because of the weaknesses of those other methods that include longitudinal, cross-sectional, historical, content analysis, emergent strategies (like discourse analysis), secondary data analysis, comparison, evaluation, design-demonstration, correlation analysis, trend analysis, and status designs. All these methods do not completely satisfy the research aims considering the context in which this study was conducted.

4.4 Human-computer interaction ethnography

There are two aspects in the method of HCIE: Human–computer interaction (HCI) and ethnography as explained in sections 4.4.1 and 4.4.2 respectively.

4.4.1 Human-computer interaction

In human-computer interaction (HCI) there are humans, computer and interactions involved. Humans can be the end users of a piece of software (in this case, the social networking tool or LMS). They can be more than one like in the case of social software where one may be interacting with other users or a community of users including friends and collaborators with whom users interact through the software. Computer is the machine that the software runs on and nowadays that can be a collection of computers on the network consisting of many servers in the cloud and mobile clients (carried in the pocket) that the users use to interact with other online users.

Interaction can be thought of as a dialogue where the users tell the computer what they want done or who they want to interact with and the computer processes that and communicates the results back to the user. This is done through the user interface (UI). UI are part of the application that is designed to allow this interaction (dialogue) to happen and it can be in software and hardware components. So in general, HCIs are design, prototyping, implementing and evaluating of UIs whether they are hardware or software interfaces. HCI is an interdisciplinary field that has three strands in it namely, design, computer science and applied psychology.

Creating UI involves assessing the interest of the users, this includes preferences, generally described as requirements. From cognitive science, any design that involves human users is really hard to get it right the first time. Understanding the users is very important but this situation is even complicated if the intended use of the software is different from the actual scenario in which they are used. For instance, social networking tools were not designed for educational purposes therefore, user requirements should be reengineered as was the case with this study. And you can do that by interacting with them, interviewing and observing them, to understand the core principles for design, culture and other factors that influence perception of the users.

Since the design of social networking tools was not specifically meant for educational use and there seem to be great challenges when they are considered for educational purposes, part of this research was to evaluate the educational affordances of social networking services in the context of higher education in developing countries. Evaluating the design in respect to users' needs and the contexts in which the product is used was therefore very important that is why through Ethnography, the researcher was able to find how suitably the social networking tools would meet the user's needs.

4.4.2 Ethnography

Ethnography, which has its roots planted in the fields of anthropology and sociology, is used by researchers to conduct ethnographies in organizations and communities of all kinds. Different scholars define it in different ways. Fetterman (1998) define ethnography as 'the art and science of describing a group or culture. The description may be of a small tribal group in an exotic land or classroom in middle-class suburbia. Maanen (1996) asserts that when used as a method, ethnography typically refers to fieldwork (alternatively, participant-observation) conducted by a single investigator who 'lives with and lives like' those who are studied, usually for a long time.

Ethnography involves the researcher participating, overtly or covertly, in people's daily lives for an extended period of time, watching what happens, listening to what is said, asking questions- in fact, collecting whatever data are available to throw light on the issues that are the focus of the research (Hammersley and Atkinson, 1995). This research adopted an overt type of ethnography since the assumption was made that the study was in the interest of the participants and that were would freely and substantially participant in providing useful and valid data at will.

All the three definitions emphasize the key points of living with and describing human society, pointing to the fact that ethnography involves the researcher spending time within a particular society in order to be able to describe it. Ethnography is frequently used as a social computing research method and it is multidisciplinary and therefore adopted in various researches including computer science research. In software engineering, ethnographic methods are applied mainly in the human–computer interactions research. This type of ethnographic study, adopted for this study, is referred to as human–computer interactions ethnography was sufficient for requirements solicitation as a focal point of this research.

4.4.3 Why Human-Computer Interaction Ethnography

This method can be reliable especially where the research aims at creating substantive, explanatory theory in the context of HCI, on technology use. This research aimed at exploring the effectiveness of SoCeL environments at university level and the result of which, was meant to provide basis for the design SoCeL systems such as next generation learning management systems as well educational social networking technologies in the context of higher education.

This method was appropriate for this research in the sense that it applied close observation and interviews in natural settings, taking behaviour in context whereby people attach to events and things in their everyday lives and it relies on detailed field data. Human-computer interaction ethnography is a systematic method which is not impressionistic. It gives data which is reliable since that researcher is able to immerse self in the natural settings of the context. Behaviour and perception which are largely qualitative cannot be sliced into variables and inferred using statistics; and ethnography is not aimed at generalisation.

4.5 Case Study

Lockyer and Patterson (2008) argue that research into the use of social networking technologies to support formal educational experiences necessitates a case study approach. This is because a case study allows for investigation of complex social phenomena by the examination of a set of rich data. Due to complexity and a variety of factors affecting adoption and use of technologies such as social networking tools, Case study provides a better way of investigation (Lockyer and Bennett, 2006).

Since this study involved the use of technologies in various ways and within an informal perspective, a case study was considered a suitable strategy. There are other research strategies including experiment, survey, archival analysis and history (Yin, 1989). However, case study is an ideal methodology when a holistic, in-depth investigation is needed (Feagin et al., 1991) whilst focusing on contemporary events (Yin, 1989).

4.5.1 Why case study strategy

Case studies have been used in various investigations, particularly in sociological studies, but increasingly, in information systems related studies (Easterbrook et al., 2008; Wohlin et al., 2006). The goal of case studies and other qualitative research is to understand issues or particular situations by investigating the perspectives and behaviour of the people in these situations and the context within which they act. This is in line with the purpose of this

research. Case study was applicable to all the objectives of this research – exploratory, descriptive and explanatory and it was cost and effective.

According to (Tellis, 1997), a frequent criticism of the case study methodology is that its dependence on a single case renders it incapable of providing a generalizing conclusion. Yin (1993) however presented Giddens' (1984) views that considered case methodology 'microscopic' because it did not have 'sufficient number' of cases. This criticism suggests that a number of case studies should be considered for a more complete study. However, Hamel et al. (1993) and Yin (1989; 1984; 1993; 2009; 2011) strongly argued that the relative size of the sample whether 2, 10, or 100 cases are used, does not transform a multiple case into a macroscopic study. The goal of the study should establish the parameters, and then should be applied to all research. In this way, even a single case could be considered acceptable, provided it met the established objective.

To answer the common concern that case studies provide little basis for scientific generalization especially when using a single case study, this study considered three cases studies in order to generalise to theoretical propositions not to populations or universes. Like in the case of scientific experiments where the same concern may be raised: How can you generalise from a single experiment? Quite often, some scientific facts are rarely based on single experiments; they are usually based on a multiple set of experiments, that may be replicated in different conditions. Therefore, this study carefully applied the multi case study approach to study the same phenomenon across all the three case studies with the propositions mentioned in the next section in mind.

4.5.2 Study case selection

Two universities in Uganda were selected by purposive sampling method based on the type and locations of the institutions. An earlier empirical study (Kahiigi Kigozi et al., 2009) on the students' perceptions on e-learning in Uganda also helped inform the decision. As asserted by Tongco (2007), choosing the purposive sample is fundamental to the quality of data gathered; thus, reliability and competence of the informant must be ensured. In this case, ensuring the quality of data was based on the result of the previous study indicating that which universities had reasonable level of e-learning implementation.

Uganda has two types of institution categorised based on ownership: public and private institutions. Public universities are established by the state while private universities are established by private individuals or group of individuals with approval by a statutory agency

responsible overseeing the higher education in Uganda. According to the findings by Kahiigi Kigozi et al. (2009) the level of ICT environment is at least 'fairly adequate', useful and available in all the six universities that were studied. The following universities were studied; Makerere University, Kyambogo University, Mbarara University of Science and Technology, Uganda Christian University, Nkumba University and Kampala International University.

With this in mind, Uganda Christian University and Makerere University were chosen as the main site of study for this research since the study required availability of ICT tools such as Internet access, access to social networking tools, LMS, mobile phones, email, chats which were reported to be at least fairly adequate. Table 4.2 provides the case selection strategies.

Table 4.2 Initial case selection strategy

Study	Objectives	Activities	Methods	Participants
1	Determine the perceptions and experience of lecturers on informal learning activities Establish the general perceptions and experience of students and Lecturers about the use and pattern of social networking in the learning process.	1. Create 2 samples from in each institution; one sample representing students of all categories; one sample representing the lecturers of all categories 2. Disseminate survey questionnaires 3. Analyse the survey data to produce baseline data 4. Produce interview guide based on the results of the survey and the research questions	Survey questionnaires	Lecturers, Students
2	Develop deeper analysis on how social collaboration is integrated in learning process	1. Create 3 focus groups from each institution; one representing students for different dimensions; one for lecturers form different dimensions and one for both lecturers and students. 2. Hold discussions and interviews on concepts of informal learning, social media, and LMS 3. Develop from the focus groups the views on social collaborative e- learning	Focus group Interviews	Lecturers, Students
3	Evaluate the students' and lecturers' perception on social collaborative e-learning environment	1. Select a class for case study from each institution and interact with them and observe them for two to	Interviews, Observation Survey questionnaires	Institution leaders, Lecturers, Students

	in relation to learning experiences and outputs	three months. 2. Evaluate their social networking activities basing on the knowledge developed during focus groups 3. Get feedback from participants and other key informants 4. Develop survey questionnaires 5. Disseminate survey questionnaires		

Since the main aim of the study is to explore the effective integration of the SoCeL environment involving informal learning and social networking, three key stake holders in the learning process was selected to take part in the case studies as objects. Therefore, the main objects for this study were students, lecturers and institution leaders (though with limited focus). The summary in Table 4.2 shows the case selection objectives, activities involved, data collection methods and participants involved as objects.

4.6 Pilot study

A pilot study was conducted in one month (May 2014) as a precursor for the first stage (case study 1) of this research. The main purpose was to test the effectiveness of the questionnaire before the final version was made and deployed. In this pilot study, 15 students and 8 lecturers were randomly selected to provide the feedback related to the general structure of the questionnaires; the clarity and relevance of the questions.

Piloting is an important pre-stage of a research since many people become irritated by questionnaires and refuse to fill them out (Wisker, 2008) so it is important that to pilot questions to ensure that questionnaires are perfected especially since these first sets of questionnaires were be both qualitative and quantitative. After completing this pre-test, the feedback will be received from the participants and used to modify the questionnaires. The results of this study helped shape the main study and most importantly the findings were also published in a conference proceedings (Otto et al., 2015).

4.7 Data collection, analysis and interpretation

This research employed a multi-method approach to data collection (as summarised in Table 4.2) since it is an exploratory research with both descriptive and explanatory subsidiary questions requiring both qualitative data and quantitative data. Triangulation is not only for

data validation and deepening the understanding of the research but also to provide inter-disciplinary bond as this research falls in the domains of multiple disciplines.

Each of the methods selected has its strengths and weaknesses. In order to neutralize the weaknesses in one method, another method is employed. For example, some data required are quantitative and therefore the qualitative techniques do not sufficiently apply. Survey questionnaires and some qualitative methods such as "focus groups and interviews are useful for preliminary or exploratory tool, but their results must be verified by quantitative work on representative sample" (Morgan, 1988, p.10) and more qualitative tools.

Therefore, in this research, after conducting initial survey questionnaires, other techniques such as focus groups and interviews were applied in the first phase (case 1 and 2) in order to determine perception and experience of students and lecturers. This provided a focused analysis of what they know, what they do and their attitude in regards to social collaborative e-learning practices.

In the second phase (case study 3), the research focused more on understanding the process of integration of SoCeL based on the three key concepts namely; informal interactions, social networking and social learning management to allow the participants get involved in activities that scaffold students learning. As in (Morgan, 1988), if one wants to collect data on other social actions, rather than just the discussion of this activities, then the increased naturalism of participant observation is necessary. This is why other HCI ethnographic techniques such as observation and interviews was applied.

4.7.1 Data collection techniques

4.7.1.1 Survey questionnaires

Wisker (2008, p.187) argues that questionnaires are used when "you seek responses from large numbers of respondents, as they can be counted, measured and statistically analysed". In the first stage of this research survey questionnaires were used in order to gather the baseline data which are largely quantitative although some qualitative data were also collected by this tool.

This aspect of research sought responses from large numbers of respondents, representing a cross-section of the students and lecturers of the two selected universities. The responses are gathered in a standardised and objective way; and they were used to provide basis for the interviews, which were conducted at the later stages of this research. Analysis of these data helped generate more questions and information that required further probing.

4.7.1.2 Focus groups

Focus groups are useful for either as a self-contained means of collecting data or as a supplement to both quantitative and other qualitative methods (Morgan, 1988). In this research however, focus groups were used as a supplement method in phase 1 and 2 of the study. As group interview, focus groups combine elements of both individual interviews and participant observation in groups. However, compared to participant observation, it offers the opportunity to observe a large amount of interaction on a topic in a limited period of time. Compared to individual interviews, the use of focus groups, as an interview technique, clearly lies in the ability to observe interaction on a topic. Using focus groups as an exploratory research requires less preparation (Morgan, 1988).

There were three focus groups that were set up for the first two phases. The first focus group constituted lecturers, the second composed of students and the last group were both students and lecturers. Selecting participants were purposive without considering generalizability. This is especially important since the goal of this studies involved at these phases are not testing hypotheses but to learn about the experiences and perspective of participants carefully selected considering their relevance to the topic of the inquiry in order to provide the most meaningful information.

The collection of the focus group data was mainly by voice recorder although some video recordings were also made and notes taken. To help with facilitation and logistical arrangements, there were some assistants recruited for this purpose. Analysis of the focus group data followed systematic coding via content analysis (Morgan, 1988). The interpretation and reporting have been presented in the results chapters 5, 6, and 7.

4.7.1.3 Observation

"Observation can be a very rich source of information for the researcher. It enables you to capture what people actually do rather than what they say they do. You can observe them in the context and relate to your research questions while you observe" (Wisker, 2008, p.187). It is a qualitative method with roots in traditional ethnographic research providing researchers opportunity to learn the perspectives held by study populations. This method connects the researcher to the most basic of human experiences, discovering through immersion and participation the 'hows' and 'whys' of human behaviour in a particular context.

The philosophical position being subjectivist, this research presumes that there would be multiple perspectives within the higher education institutions under study. Therefore, the research focused on both knowing what those diverse perspectives are and understanding the

interplay among them. Making the choice to employ field methods involves a commitment to get close to the subject being observed in its natural setting, to be factual and descriptive in reporting what is observed, and to find out the points of view of participants in the domain observed (Genzuk, 2003).

This research employed fly-on-the-wall observation and participant observation as part of the HCI ethnographic approach in this design. The aims of fly-on-the-wall observation were to gain familiarity with the physical and social context of the selected institutions and to observe informal, social interactions among students and lectures without influencing the social context.

The aims of participant observation were to gain an intimate familiarity with and an in-depth understanding of how students learn, use social networking tools, relate to each other, share information, interact with lectures, etc. and to gain an insider's perspective on how students and lecturers interact within the institutions especially in relation to the learning process. The outcome of observation technique was field notes in written, audio and video form.

4.7.1.4 Interviews

There was a continuum of interviews ranging from informal and conversational interaction, which flows with thoughts and feelings of both the interviewer and the interviewee, and the much tighter, more structured interview. Opdenakker highlights four forms of interview as face-to-face, telephone, messenger, and email.

This research employed mainly face-to-face interviews because of its characteristics of synchronous communication of time and place. Face-to-face interviews have long been the dominant interview technique in the field of qualitative research. In the last two decades, telephone interviewing became more and more common (Opdenakker, 2006).

Interviews can be structured, semi-structured or unstructured. In a structured interview, the interviewer completes a set of structured questions with multiple multiple-choice responses, and asking questions in the order of those questions (rather, like a questionnaire filled by the interviewer after questioning the interviewee) (Wisker, 2008). This can however be too guiding and limiting although analysing it becomes simpler. Semi-structured interviews address both the need for comparable responses (asking same question of each interviewee) and the need for the interview to be developed by the conversation between interviewer and interviewee, which is often very rich and rewarding. With unstructured

interviews, an in-depth, narrative or non-directive approach is normally taken- more or less conversational.

The disadvantage with this is that it could go very much off the point and very difficult to transcribe or analysis and compare with other interviews. With this in mind, the choice of semi-structured interview technique was made to suit the ethnographic study of the (participants) students and lecturers as well as some other key informants such as institutional leaders. Most of the interviews was conducted in the second and third stage of this study. The analysis was meant to enrich the information obtained from stage 1 surveys as well as the stage 2 focus group discussions.

4.7.2 Ethical considerations

A good research practice must observe the key principles of research including honesty, objectivity, integrity, carefulness, openness, confidentiality and human subject protection (Shamoo and Resnik, 2009). Due considerations have been made to ensure that this study is consistent with these principles. As usual, the research may have unintended psychological and social harm since it employed a range of interactions including in-depth interviews, focus groups, surveys, or even observing people's behaviour. Some people may not be comfortable to reveal some details on how they use social media for interactions or with whom they interact since they may consider it private. Others may feel uneasy when they are being observed as they interact with their 'friends'. And others would fear that disclosing their feelings and perceptions might lead to undesired consequences.

Therefore, measures were taken to ensure that the study observed the ethical standards that match the level set by the University Code of Good Practice in Research (University of Reading, 2012) as well as those of the countries in which the field study was conducted. Since this research involved personal data of students, lecturers as well as other key informants of the institutions who are above 18 years of age, a review was sought from School of Systems Engineering Research Ethics Committees and abided by the outcome of those reviews. Confidentially and anonymity of the participants were maintained through anonymous reporting in all the publications and thesis.

There was an appropriate measure taken in selecting the participants whilst ensuring that participants are able to give adequate accurate information through the survey questionnaires that was carefully designed, disseminated to the participants after obtaining to informed consent. Based on the data obtained through these questionnaires, especially their

level of involvement and the willingness to be involved, participants were selected to participate in the focus groups. Before any focus group interaction was made, informed consent was also sought. This also applied to the cases that were selected for observation and interviews.

As required by the University of Reading (2012), all research participants were informed that data gathered during the course of research might be disseminated not only in thesis but also in different forms for academic or other subsequent publications and meetings, albeit not in an identifiable form, unless previously agreed to, and subject to limitations imposed by legislation or any applicable bodies, ethical, regulatory or otherwise.

4.7.3 Validity and reliability

In order to ensure that findings are accurate, consistent and useable, the research was conducted in an appropriate manner whilst observing validity and reliability of all steps involved. "The use of reliability and validity are common in quantitative research and now it is reconsidered in the qualitative research paradigm. Since reliability and validity are rooted in positivist perspective then they should be redefined for their use in a naturalistic approach" (Golafshani, 2003). Validity of a research means to the ability of a technique to produce what it is supposed to produce from the stand point of the researcher, the participant and the readers of the account. In this study, all data collection and analysis tools that were be employed were thoroughly run through validity checks. Yin (1984, p.43-5) explains two types of validity; internal and external.

Internal validity problems in case studies are majorly in making inference therefore, this research ensured that explanations and possibilities are considered before any inference was made. On the other hand, external validity problems in case studies relate to poor basis for generalization. As such, this research treated the samples and case studies very carefully in that a statistically selected samples used in the survey (first stage of the research), may be easily used for generalisation but this was not the case with the case studies.

Reliability of the research is the extent to which findings are consistent over time and an accurate representation of the case under study and where the findings of that research can be reproduced under a similar methodology. "The general way of approaching the reliability problem is to make as many steps as possible as operational as possible and to conduct research as if someone were always looking over your shoulder". (Yin, 1984, p.45)

This research ensured that all the data and interpretations made were made only after a representative of the study case. Effective measures of triangulation were taken at each stage of the research, for all cases selected and in all the institutions that were studied. Some data were triangulated using different methods, others were triangulated using different cases and others were triangulated using different stages. This also meant that the conclusion about any findings was crosschecked using multiple means.

4.7.4 Assumptions

Since this study is an exploration using descriptive and explanatory questioning techniques which are largely qualitative in nature, there are no hypotheses to be tested. However, in order to effectively probe these questions whilst observing the propositions stated earlier in this chapter, there were some key assumptions made:

1. Each participant would have the ability to express his or her thoughts, ideas and feelings about SoCeL practices to demonstrate their prior knowledge on the subject.
2. The researcher would be able to interpret data without biases that can have considerable effects on the research findings
3. The time and resources would be adequate to employ successfully the HCI ethnographic techniques that have been planned.
4. To effectively observe subjects, there ought to be suitable activities, time and environment to allow the researcher have opportunity to adopt and learn the subjects adequately.

4.7.5 Data analysis

Data was collected in four months from May 2014 to September 2014. During this period, the researcher was resident in Uganda and had adequate access to data. In the first stage of the study, data was obtained through survey questionnaire that was administered online. This was followed up with interviews. A survey questionnaire was administered to a number of students and lecturers from Makerere University and Uganda Christian University to which, 545 students and 43 lecturers responded.

There were 31 interviews conducted after the survey questionnaire was administered; 20 interviews with students, 5 with the lecturers, and 6 with the university officials, were conducted. After data preparation, qualitative and quantitative data analysis using NViVO 10 and IMB SPSS respectively was undertaken.

4. RESEARCH METHODOLOGY

A hybrid approach for thematic and content qualitative analysis involving both deductive and inductive coding and theme development (Fereday and Muir-Cochrane, 2006) was employed to further synthesise the qualitative data. Statistical analysis using various methods were carried out. The details of these analyses are presented in the results chapters: 5, 6, and 7.

Chapter 5

Social Collaborative e-Learning Environment

5.1 Introduction

The objective of this chapter is to explore the learning environment and understand how it determines the choice of social collaborative technology for teaching and learning. The data presented here were obtained through a survey questionnaire and a series of interviews conducted in two universities in Uganda – Makerere University and Uganda Christian University.

In order to establish the extent to which social collaborative e-learning (SoCeL) is possible within the contexts of a university in a developing country, the study considered the learning environment in two dimensions – the method of delivery of learning material and the learning contexts. Three methods of delivery of learning materials were considered, namely: face-to-face, online, and blended learning. The learning contexts considered were: social, technological, and pedagogical learning contexts.

Section 5.2 presents the key findings on SoCeL environment while sections 5.3 and 5.5 highlight the techniques used to collect the data related to SoCeL environment. Sections 5.5 and 5.6 present analysis on the methods of delivery of learning materials and learning contexts respectively. In 5.5, a discussion has been made on the current methods of delivery of learning materials and the preference of students and lecturers. An analysis based on the SoCeL contextual model, focusing on the social, technological and pedagogical contexts, is presented in section 5.6. Section 5.7 concludes the chapter with recap of the key discussion points.

5.2 Key findings on social collaborative e-learning environment

These results are based on the survey questionnaire and interviews, which were conducted in both universities. The interviews were conducted after the initial analysis of the survey data.

There were 31 questions in the survey questionnaire, which had five sections (A, B, C, D, and E). Samples of these data collection tools are provided as part of Appendices.

It should also be noted that not all of the participants responded to all questions in the questionnaire. A combination of individual and group interviews was also conducted after the survey was completed. The data presented in this chapter were responses given by the participants to some questions within sections C, D, and E of the questionnaire and some were from the follow-up interviews. The findings have been grouped into two themes; delivery of learning materials (5.3) and learning contexts (5.4) of this section, which were the key topics for analysis in this chapter, a discussion of which have been presented in sections 5.5 and 5.6.

5.3 Delivery of learning materials

Section C of the survey questionnaire, to which 532 students and 43 lecturers responded, focused on the current learning and teaching practices. Table 5.1 summarises questions that were included in this data collection tool. Note that not all participants responded to all questions in this section.

Table 5.1 Survey questions on the delivery of learning materials

Question number	Question
C1: (Multiple response)	Have you taken/delivered any of your course units through any of the following? (Face-to-face, Online, Blended) *
C2: (Single response)	Which of the above modes of teaching would you prefer?
C3: (Open ended)	What is the reason for your response (in C2)?

* A slight difference to questions for students and lecturers (see Appendix A and Appendix B)

Data obtained from questions C1 and C2 were analysed using IBM SPSS (Version 21) while data from C3 were analysed using NVivo (Version 11). The following are summaries of the findings:

The results summarized in   Table 5.2 demonstrate the count and percentages of responses on the current mode of learning materials as given by the participants who responded to these questions.

Table 5.2 Responses on delivery method by category of respondent

	Face-to-face	Online	Blended	Total
Lecturers	31	13	29	43

(% of Lecturers)	72.1	30.2	67.4	100
Students	327	156	200	532
(% of Students)	61.5	29.3	37.6	100
Total	358	169	229	575
(% of total responses)	62.3	29.4	39.8	100

In   Table 5.3, the numbers and percentages of responses on the preferred method of learning materials as given by the participants who were surveyed have been presented.

Table 5.3 Preferred delivery mode by category of respondent

	Face-to-face	Blended	Online	Total
Lecturers	6	34	3	43
(% of total Lecturers)	14.0	79.1	7.0	100
Students	183	208	151	542
(% of total Students)	33.8	38.4	27.9	100
Total	189	242	154	585
(% of total responses)	32.3	41.4	26.3	100

Table 5.4 summarizes the key reasons which were given by the participants in response to question C3 in Table 5.1. A tick (√) means that the reason was mentioned at least once by the by the participants. A cross (×) means the reason was not mentioned by the participants.

Table 5.4 Reasons for peferrence of a method of delivery

Learning method	Reason for choosing method of delivery	Students	Lecturers
Face-to-face	Nonverbal expression and body language social cues Clarification	√	√
	Direct physical, peer contact and social interaction	√	√
	Social community/ sense of belonging	√	×
	Immediate feedback	√	√
	Being the only available option		√
	Practical nature of course	√	√
	Convenience in terms of place or time	√	×
	Low cost/no extra infrastructure; multimedia content materials, system maintenance and updating	×	√
	Easy to learn/further explanation	√	×
	Interesting/Motivating	√	×
	No prior ICT skills	√	×
	Limited Internet access	√	×

Online	Accessibility (content, people)	√	√
	Flexibility (time and space)	√	√
	Convenience (place and time)	√	×
	Personalised learning/student-cantered	×	√
	Technology trend	√	√
	Interesting	√	×
	New experience	√	×
	Prior ICT skills	√	×
	Reliability	√	×
	Self-expression	√	×
	Low cost (distance and time)	√	×
Blended	Complementarity	√	√
	Combined advantages of face-to-face and online	√	√
	Wider access	×	√
	Diversity of approach	√	×
	New trend	√	√
	Flexibility and access	√	√
	Practicality and cost effectiveness	√	√

5.4 Social collaborative e-learning contexts

In this section, key findings on learning contexts are presented. This study focuses on three environmental contexts under which SoCeL is adopted. These are social, technological, and pedagogical contexts, which may be used to conceptualise and adopt SoCeL. The data, source, and means through which they were obtained are presented in order to set grounds on which discussion and analysis was made in the subsequent sections in this chapter.

5.4.1 SoCeL social context

In the survey questionnaire that was administered to the students and the lecturers, section C which focused on the current learning and teaching practices, included some two questions within the social context domain as shown in the Table 5.5:

Table 5.5 Survey questions on the social context

Question number	Question
C4: (Multiple response)	Outside classroom, whom of the following do you interact with? (Students, Lecturer, External world) *
C5: (Multiple response)	What are the objectives of your interactions with students/lecturers? *

* A slight difference to questions for students and lecturers (see Appendix A and Appendix B)

The questions in Table 5.5 were seeking evidence to explore the nature of the existing context of social interaction and collaboration in the learning process with the aim of making recommendations (explained in chapter 7) for building SoCeL environment at a university level of education in a developing country. Table 5.6 summarizes results based on question C.4 from a survey questionnaire in which students and lecturers (n=571) in the two Ugandan universities responded.

Table 5.6 Number of students and lecturers engaging in social interactions outside class

Status	Interact with			Total
	Students	Lecturers	External world	
Lecturer	35	41	13	41
Student	521	192	46	530
Total	556	233	59	571

Figure 5.1 presents the data summarizing the responses to question C5 (Table 5.5), regarding objectives for interacting with students/lecturers. The finding (Figure 5.1) from the survey indicates that discussing assignments or class work is the most common reason given by the respondents.
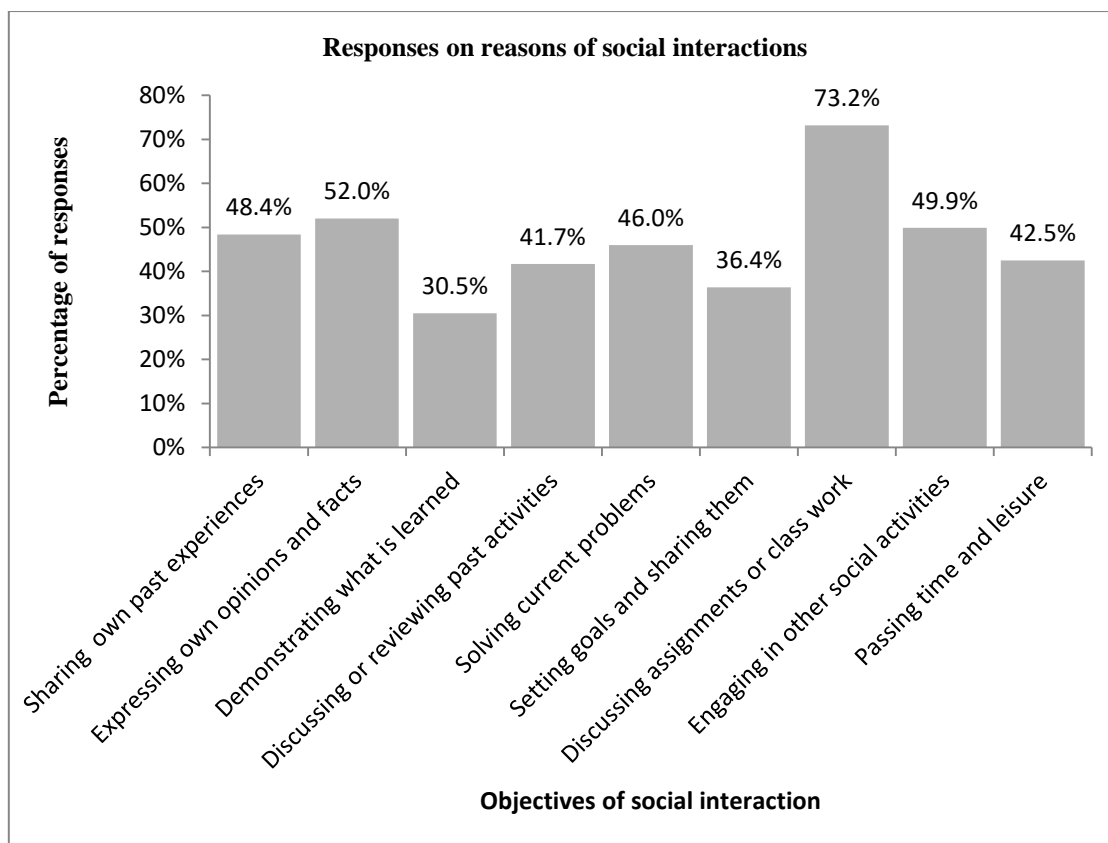
Figure 5.1 Responses on reasons for social interaction

5.4.2 SoCeL technological context

In section E of the survey questionnaire, which both students and the lecturers took part in, the focus was on learning management system (LMS). In section D of that questionnaire, the focus was on the issues of Online Social Networking tools (SNT).

Table 5.7 Survey questions on the technological context

Question number	Question
D1: (Single response)	Do you have social networking presence (social networking profile)?
D3: (Multiple response)	Which social networking platform do you use?
E1: (Single response)	Do you have any learning management system in your institution?
E2: (Multiple response)	What platform of the learning management do you use?

Table 5.7 summarises the questions based on the survey questionnaire administered to students and the lecturers

More than 94% of the participants (n=588) indicated that they had at least one social networking site profile. Three variables were considered in exploring whether or not a participant had at least one social networking profile. A social networking profile is defined as a page where one can write personal attributes representing oneself, what boyd and Ellison (2007) refers to as 'writing oneself into being'. A profile represents a user's biographical data and also displays an articulated list of 'friends' who are also users of the system.

In this study, having a social networking profile was examined against the background variables of a participant. In other words, the objective was to determine whether or not the the participant's background determined having a social networking profile. These background variables included status (student or lecturer), Gender, and institution of affiliation. Table 5.8, Table 5.9, and Table 5.10 summarise the findings in regards to question D1 in Table 5.7.

Table 5.8 Status vs number of respondents having Social networking profile

Status	Having social networking profile		Total (%)
	Yes (%)	No (%)	Total (%)
Lecturer	39 (90.7)	4 (9.3)	43 (100)
Student	515 (94.5)	30 (5.5)	545 (100)
Total	554 (94.2)	34 (5.8)	588 (100)

Chi-Square = 0.473 **
**P–value = 0.492

Table 5.9 Gender vs number of respondents having Social networking profile

Gender	Having social networking profile		Total (%)
	Yes (%)	No (%)	Total (%)
Female	203 (92.7)	16 (7.3)	219 (100)
Male	339 (95.0)	18 (5.0)	357 (100)
Prefer not to say	12 (100)	0 (0)	12 (100)
Total	554 (94.2)	34 (5.8)	588 (100)

Chi-Square = 2.029 **
**P–value = 0. 363

As seen from Table 5.8, Table 5.9, and Table 5.10, there is very small probability of the observed data to reject the null hypothesis of no relationship. Using the *Chi* square test of independence with α = 0.05 as criterion for significance, the results shows no statistically significant evidence of relationship between having social networking profile and status, or gender, or institution of affiliation of a respondent.

Table 5.10 Affiliation vs number of respondents having Social networking profile

Institution	Having social networking profile		Total (%)
	Yes (%)	No (%)	
Uganda Christian University	393 (94.0)	25 (6.0)	418 (100)
Makerere University	161 (94.7)	9 (5.3)	70 (100)
Total	554 (94.2)	34 (5.8)	588 (100)

Chi-Square = 0. 105 **

**P–value = 0. 746

This study shows that whereas 95% of the students have at least one social networking profile compared to 91% of the lecturers, these differences based on status produced a moderate Pearson Chi-Square, ($\chi^2(1, N = 588) = 0.473, p = 0.492$) of no strong basis to reject the null hypothesis. This means that using the observed data, it can be concluded that lecturers were as likely to have at least one social networking profile as to students.

In terms of gender, this study established that 93% of the male respondents compared with 95% females have at least one social networking profile. This probability associated with the Chi-square statistic of 2.029 (in Table 5.9) is more than 0.05 indicating there is also no strong relationship between whether or not someone has a profile and his or her gender.

Similarly, basing on the one's institution of affiliation, the observed data does not provide statistically strong evidence to reject the null hypothesis since the probability associated with the Chi-square statistic of 0. 105 is more than 0.05. This means that regardless of one's institution of affiliation, the probability of a student or a lecturer having at least one social networking profile is as high. The data presented in Table 5.10 show that 94% of students and lecturers at Uganda Christian University have at least one social networking profile, which is comparable to 94.7% from Makerere University.

To explore which social networking technologies are used by students and the lecturers, fifteen technologies were considered. Figure 5.2 illustrates the percentages of respondents who reported using each of these technologies.
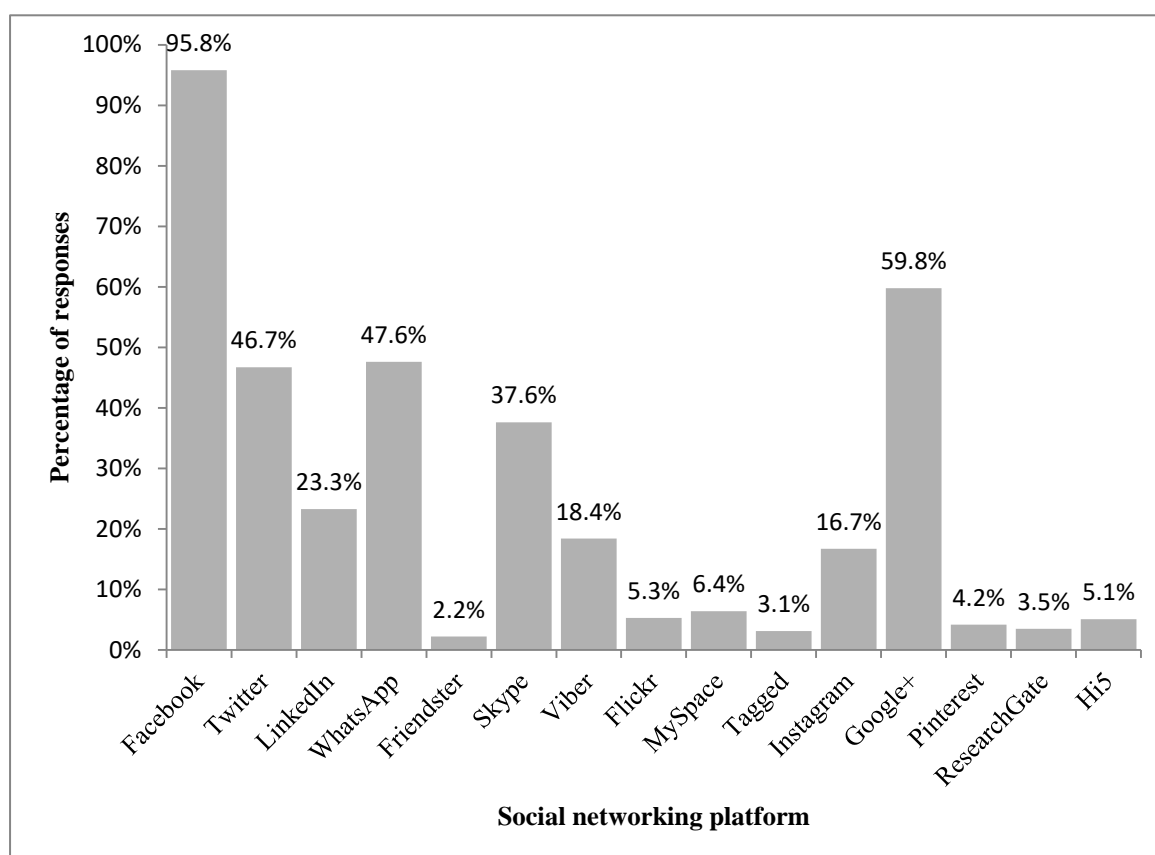
Figure 5.2 Percentages of respondents using various social networking technologies

From the data represented in Figure 5.2, the top five technologies used by at least 37% of the respondents are Facebook, Google+, WhatsApp, Twitter, and Skype. The four least used platform (used by less than 5% of respondents), are Friendster, Tagged, Researchgate, and Pinterest.

In Uganda and other developing countries (Grönlund and Islam, 2010), due to better penetration of mobile phones and availability of cheaper and sometimes free data usage for social collaborative technologies such as Facebook, there is heavy reliance on mobile technology in support for SoCeL (Mayende, 2007). There has been a rapid spread of mobile telephony across Africa despite the challenges of availability of computers, electricity and Internet connectivity, making Africa far below those in many other parts of the world (Unwin, 2008). Furthermore, the increased competition among mobile operators in Uganda has significantly reduced tariff rates for mobile data service and made the low-cost phone sets available to even financially constrained subscribers.

The Uganda Communications Commission (UCC, 2015) reports that the mobile Internet subscription continues to grow and the Internet penetration per 100 population standing at 37.4% by the end of 2015. This could explain why Facebook and Whatsapp are the most common tools used by students in support for SoCeL. Most students in higher education institutions in Uganda have mobile phones (Zhu and Justice Mugenyi, 2015).

In response to question E1 (Table 5.7 page 105) regarding having a learning management system (LMS) in the institution of affiliation, 65% of the respondents indicated that they used LMS in their institution, 14% reported they didn't used any LMS while 21% were not sure whether or not they used any LMS in their institution of affiliation.

Table 5.11 summarises the findings in regards to question E1. In general, it can be observed that there is a higher awareness of and access to social networking tools compared to the LMS, which could be explained by the increased penetration of the mobile telephony and reliable mobile data access.

Table 5.11 Affiliation of respondents by probability of having used LMS

Institution	Having used LMS			Total (%)
	Yes (%)	No (%)	Not sure (%)	
Uganda Christian University	245 (60.0)	64 (15.7)	99 (24.3)	408 (100)
Makerere University	132 (77.6)	17 (10.0)	21 (12.4)	170 (100)
Total	377 (65.2)	81 (14.0)	120 (20.8)	578 (100)

Chi-Square =16.668 **

**P–value < 0. 001

As shown in

Table 5.11, 60% of the respondents from Uganda Christian University, compared to 78 % of the respondents from Makerere University used LMS in their institutions; 16% of the respondents from Uganda Christian University, compared to 10 % of the respondents from Makerere University didn't used LMS in their institutions. 24% of the respondents from Uganda Christian University, compared to 12 % of the respondents from Makerere University were not even sure about having used LMS in their institutions.

Using the *Chi* square test of independence with α = 0.05 as criterion for significance, this result shows that there is statistically significant evidence to reject the null hypothesis of no relationship. The probability associated with the chi square statistic of 16.668 is less

than .001 indicating there is a moderate relationship between having used LMS and the respondent's institution of affiliation.

Question E2 (Table 5.7) was focusing on the platform of the LMS the respondents used. Five technology platforms were considered; Moodle, Canvas, Blackboard, Click2learn, and Webstudy. The results as summarized in Figure 5.3 indicate that Blackboard, Webstudy, and Moodle were the used by most respondents.
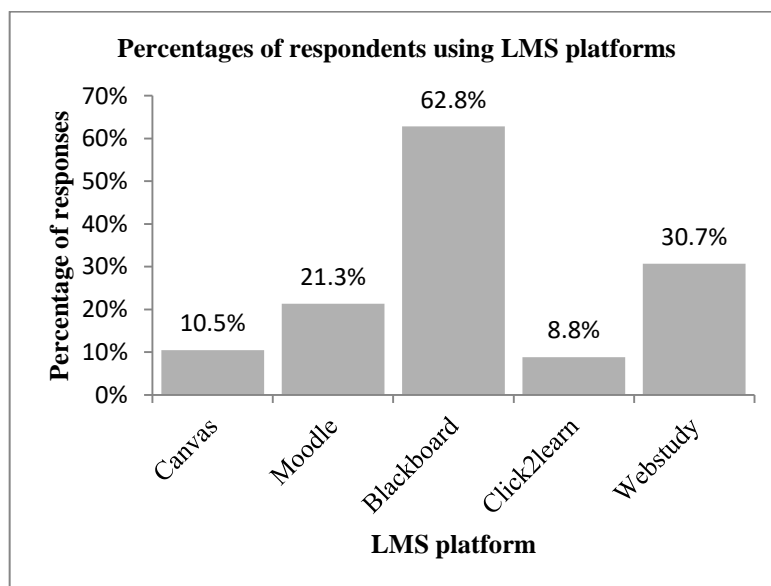
Figure 5.3 Percentages of respondents using LMS platforms

5.4.3 SoCeL pedagogical context

Question D4 in section D of the survey questionnaire explored the SoCeL pedagogical context by examining the use of social networking profile by respondents. As illustrated in Figure 5.4, the participants (n=544) who responded to this question indicated that chatting (77%), sharing information (77%), making friends (71%), learning (64%), and seeking information (63%) are the top activities that are performed using the social networking profiles. These indicate that most of the time spent on social networking platforms are for informal interactions and collaborations. These findings could provide crucial information for policy formulation. What is clear though is that since informal interaction tend to dominate the usage, lecturers could benefit from integrating informal learning strategies in the learning design.
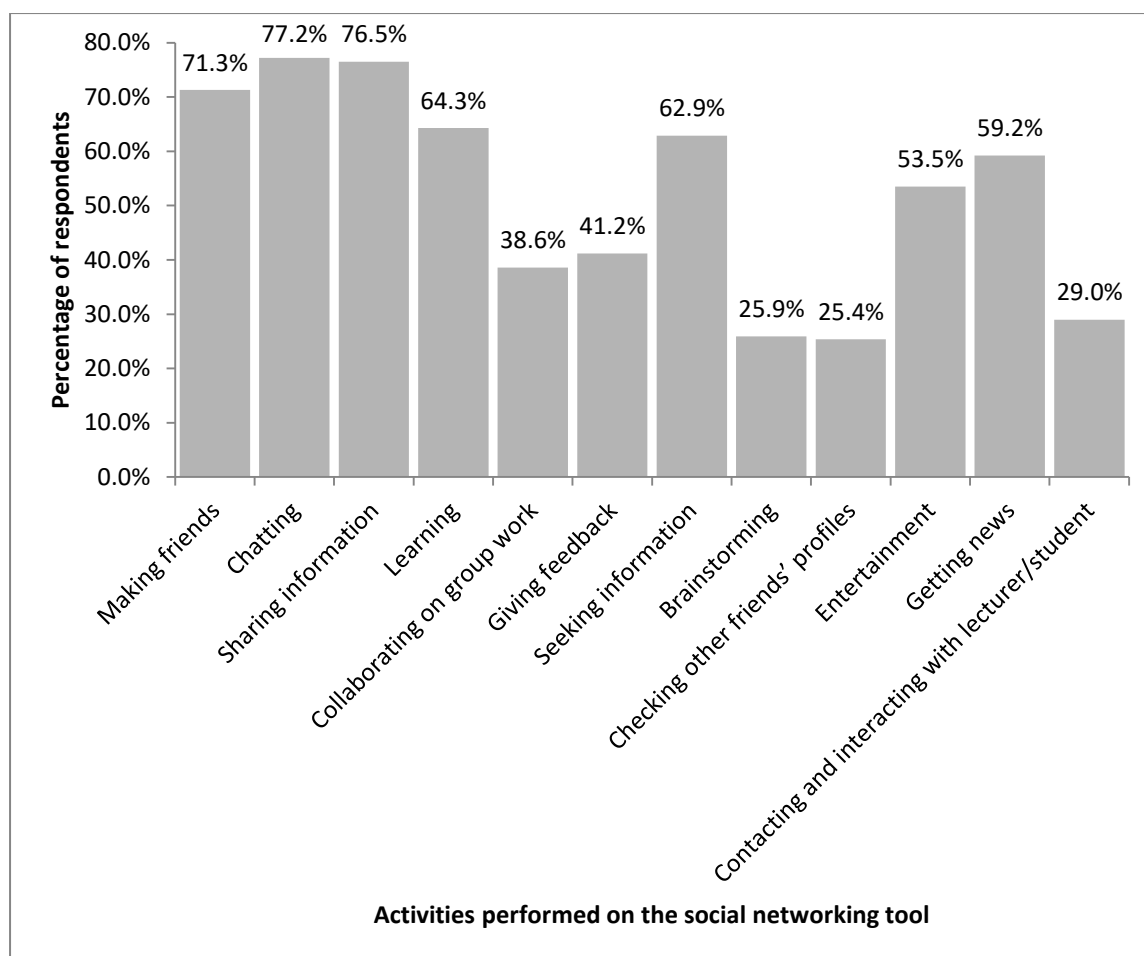
Figure 5.4 Responses on the activities on the social networking tools

5.5 Methods of delivery of learning materials

This section provides a discussion and analysis on the methods of delivery of learning materials in regards to SoCeL environment. The basis of this discussion and analysis is the findings presented in section 5.3 and related findings from literature. This study shows that the traditional approach to instruction using face-to-face is currently the most common method at both Uganda Christian University and Makerere University where this research was based. Most of the courses here are delivered through face-to-face method although some are delivered through e-learning, mainly through blended learning, but also through online learning.

The results summarized in Figure 5.5 from the survey questionnaire of students and lecturers (n=575) show that 62% of the participants reported to have used face-to-face method, while 40% reported to have used a blended environment, 29% of the respondents

reported to have used online method, and 25% of the participants reported to have used multiple methods. One thing that comes out quite clearly from this investigation is the fact that the three alternative methods of delivery have some pros and cons which are responsible for having all of them adopted concurrently. Even if given the opportunity to choose the method of preference, students and lecturers would still have the three methods of delivery run concurrently although blended approach would be the preferred method of the majority (41%).
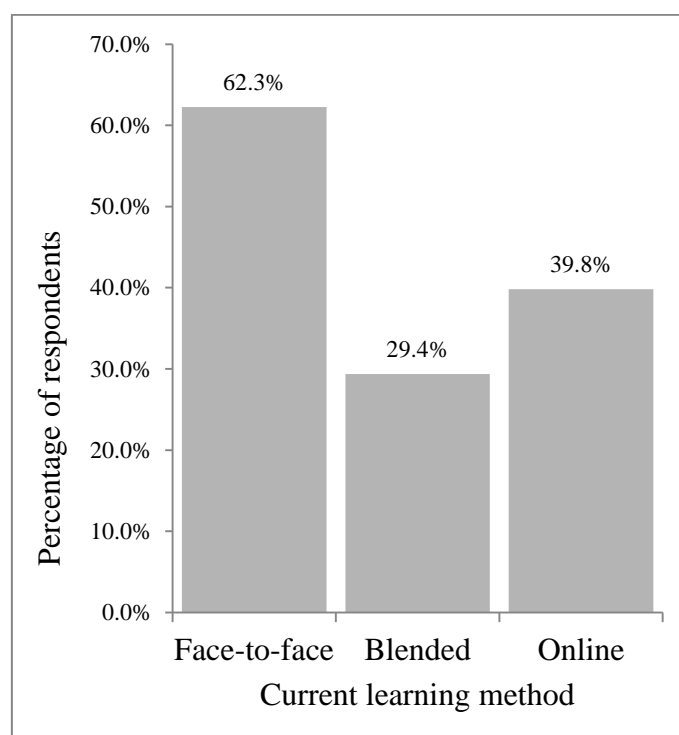
Figure 5.5 Responses on current learning method

It seems, from the perspective of respondents, that the choice of a particular method depended on the available resources, nature of the learning materials, and readiness of the institution (including participants). The results summarized in   Figure 5.6 illustrate the outcome of a survey of students and lecturers (n=585) on the preferred method for their course. The participants were asked about what they would want their institution to adopt in delivering their respective courses, most of them (41%) preferred a blended environment; 32% of the respondents preferred face-to-face approach; and 26% preferred online approach. A tick (√) means that the reason was mentioned at least once by the by the participants. A cross (×) means the reason was not mentioned by the participants.
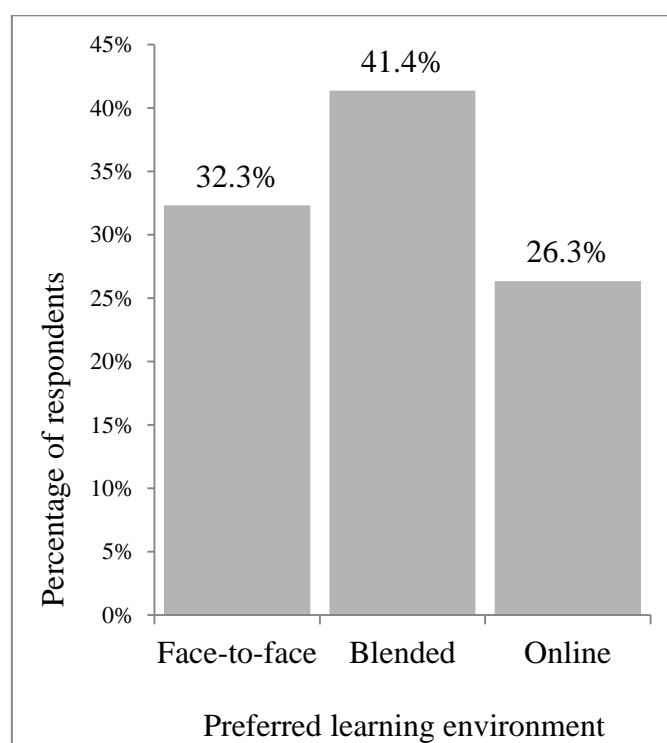
Figure 5.6 Responses on preferred learning environment

This result shows that although currently most courses are delivered through face-to-face, students and lectures would be happier with a blended approach in which some courses or part of them are delivered through face-to-face and some (or part of them) are delivered online. It is the most outstanding finding here since it demonstrates that despite the emergence of online learning tools, students and staff still prefer some element of face-to-face. The technology's role here is to enhance the learning experience as a supplement, not a replacement. In the following sections reasons given by respondents for each of these methods are presented and discussed. Table 5.12 summarizes reasons for choosing method of delivery of learning materials in regards to SoCeL environment basing on the finding of this study and other related studies in literature.

Table 5.12 Summary of the reasons for choose of learning method.

Learning method	Reason for choosing method of delivery	From data	From literature (reference)
	Physical interaction: Peer contact and social interaction	√	(Wu et al., 2010; Paechter and Maier, 2010)
	Social community: sense of belonging	√	(Zhang et al., 2004; So and Brush, 2008)

Face-to-face	Immediate feedback: further clarification	√	(Zhang et al., 2004; So and Brush, 2008)
	Control and leadership: Control over class content and learning process	×	(Zhang et al., 2004)
	Only available option: familiar approach	√	(Zhang et al., 2004)
	Practical nature of course	√	×
	Low cost/no extra infrastructure; multimedia content materials, system maintenance and updating	√	(Wu et al., 2010)
	Interest and motivation	√	(Zhang et al., 2004)
	Limited Internet access	√	
Online	Flexibility and convenience (time and space)	√	(Zhang et al., 2004)
	Personalised learning: student-cantered, effectiveness for individualized and collaborative learning	√	(Wu et al., 2010)
	Technology trend; new experience	√	(Zhang et al., 2004)
	Interesting and motivation	√	×
	Prior ICT skills	√	×
	Reliability and availability to global audience	√	(Zhang et al., 2004)
	Self-expression	√	×
	Low cost (distance and time)	√	×
	Knowledge reuse and sharing	×	(Zhang et al., 2004)
	Asynchronous environment: Time to synthesise	×	(Zhang et al., 2004)
	Complementarity	×	(Wu et al., 2010)
Blended	Combined advantages of face-to-face and online	√	×
	Digital life	√	(Wu et al., 2010)
	Diversity of approach	√	×
	Helps in research	√	×
	Flexibility and access	√	×
	Instructional richness	√	(Graham, 2006)
	Access to knowledge content	×	(Osguthorpe and Graham, 2003; Graham et al., 2003; Graham, 2006)
	Social interaction	×	(Osguthorpe and Graham, 2003)
	Increased cost effectiveness	×	(Osguthorpe and Graham, 2003)

5.6 Social collaborative e-learning contextual model

As already discussed in the previous sections, there is evidence to suggest that students and lecturers would like to adopt a blended learning as opposed to purely face-to-face or purely

online learning. The assumption this thesis draws here is that the respondents acknowledge the increased availability and capabilities of online delivery at the same time would like to experience the benefits that are associated with the traditional classroom environment. This therefore poses a challenge on how to make the online classroom more accommodative of the traditional classroom characteristics. While the increased availability and capabilities of online delivery method is a positive change, questions emerge as to its effectiveness.

One way to address effectiveness of online learning is through a careful blending of learning contexts. SoCeL approach aims to achieve this through providing a combination of technologies to reflect the desire of the students and lecturers for a blended e-learning environment. In order to explore the environment under which SoCeL may be adopted in higher education level, three contexts have been considered namely; social, technological and pedagogical contexts. E-learning environment must address simultaneously these contexts (Hudson, 1999) for effective implementation. Basing on the findings presented in section 5.4, a SoCeL model is proposed (Figure 5.7) and discussed in this section.

SoCeL aims to provide an environment characterised by (a culture of) active social interactions and collaborations between student and lecturer or among students themselves or students with external world using learning management system or social software (technology) in order to support effective formal and informal learning (pedagogy). SoCeL environment combines the advantages of online collaborative learning and social networking.

The Internet does not only support accessing information but it also facilitates the creation of online communities through what is referred to as interactive Web. New advances in Web-based technology have brought opportunities to education and training in particular through online instruction (Johnson et al., 2000) and interactions. The interactive Web supports interaction among individuals who share common interests and goals.

This study sought to develop a model for SoCeL as an interactive approach to e-learning implementation. The learning environment may be interpreted as the contexts in which learning occurs and which affect students' achievement and attitudes. The SoCeL environment is defined to include social, pedagogical, and technological contexts in which students and lecturers actively interact and collaborate as illustrated in Figure 5.7. This proposed model illustrates how the SoCeL environment is an integrated e-learning approach, highlighting social, technological and social texts in which learning is made interactive and networked. The key concepts in the model are learning material, learning management system, social networking tool, which have been explained in respect to the three learning

contexts. The next sections explore each of these contexts and how they shape the environment for the adoption of SoCeL by university students and lecturers in a developing country.
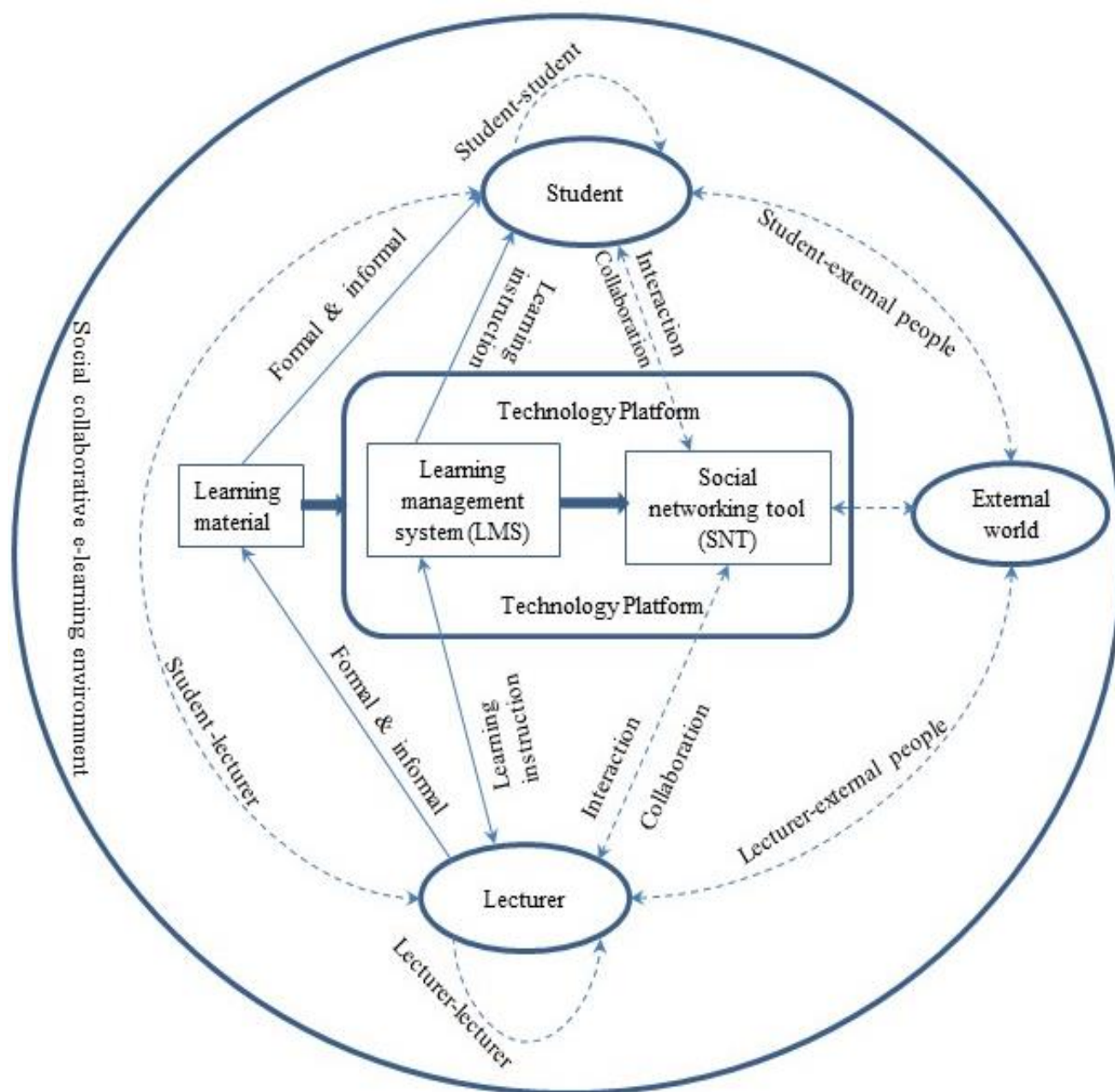
Figure 5.7 Social collaborative e-learning contextual model

As depicted in Figure 5.7, the choice of what tool and how to use it for learning / teaching is dependent on the SoCeL contexts as explained in the following sections. The following determine the type of interaction within a SoCeL environment: Learning materials (can be formal and informal), people involved (who is providing material and for who and for

what purposes). These determine whether the interaction is formal or informal characterised with presence of deliberate learning instruction (represented with solid lines) of social interaction including for collaboration (represented with dotted lines). For example, when a student is interacting with a peer, it can be either informal interaction or a formal interaction for the social or collaboration. The contexts of the SoCeL environment can be categorised into social, technological, or pedagogical as explained in the following sections.

5.6.1 Social environment

SoCeL aims to provide a social environment characterised by the culture of active interactions and collaborations, for example, between student and lecturer or among students themselves. The significance of social culture in e-learning environments cannot be underestimated after all learning is social in nature in the sense that people learn as they socialise (Stamps, 1997). According to Stamps, when people adopt the culture of free interaction within a community space, both explicit and implicit or tacit knowledge gets to be shared.

Zhu and Justice Mugenyi (2015) reports that in Ugandan institutions of higher learning, culture and social environment remains a threat to adoption of e-learning. These authors cite passive learning culture, students being used to spoon-feeding and not used to deep learning, as some of the cultural issues threatening the adoption of e-learning in Uganda. According to Basaza et al. (2010, p.88), "the Ugandan culture tends to be a verbal, or talking, culture; thus, students feel pressure when they are expected to read and write for extended periods of time". This could result reduced flexibility to adapt to institutional culture, teaching practices, and disciplinary uniqueness (Sife et al., 2007) required for effective implementation of SoCeL.

Ugandan educational institutions attract students and the lecturers from a variety of family situations, income strata, and cultural backgrounds. As a result, building an environment that promotes active social interactions among students and between student and lecturers may be challenging given the different cultural settings. This may involve adopting a "supportive group culture" (Pillay and Alexander, 2015) that brings participants into a common social perspective in order to promote shared goal of constructivist learning environment.

The term culture is used to encompass ethos and characteristics of the institution or class, including how individual students and lecturers interact with and treat one another; the

values, beliefs, or notions about acceptable and unacceptable behaviour, and other socially constructed ideas that they are taught. It also includes ways in which a lecturer organizes an educational and social setting to facilitate learning, for example, by conducting classes in a relevant style, grouping students in specific ways, initiating and facilitating communication among students, organising learning materials, or utilizing digital technologies, and establishing supportive social learning context.

Cultural backgrounds, for instance, influence teaching and learning and consequently, many perplexities can arise as lecturers interact with students especially when lecturer and student come from different cultures (Hofstede, 1986), such as in the context of digital culture (Gere, 2002), which is associated with practices based on the use of communication technologies. Where lecturers interact with students who are of different cultural backgrounds, the learning environment might require different pedagogical strategies which recognise the social and technological factors that come into play. This can be due to different positions of lecturers and students within the digital divide in terms of digital skills (Van Dijk and Hacker, 2003) or status (being a student or being a lecturer).

Cultural influence on learning is also applicable in the Ugandan context. Kintu and Zhu (2016) show that a student's characteristics and backgrounds such as age, gender, self-regulation, attitudes, family and social support as well as the management of workload have impact on the learning outcomes in terms of intrinsic motivation, satisfaction, knowledge construction and learning performance. This is because as students are drawn from different backgrounds cultural complexities arise especially as they build new culture for a particular learning cohort in which they belong.

The complexity due to different backgrounds and characteristics has a bearing on the culture of a particular learning cohort and the way relevance of learning material is viewed or social interaction in conducted. In a study on "the cultural and pedagogical implications of a global e-learning programme", Selinger (2004) showed, that local lecturers are very important in helping students adapt to the style of the materials and to making a course developed in one country culturally and pedagogically relevant to another country. This is why the role of a lecturer in SoCeL environment is significant in contextualising the online social setting for effective interaction and collaboration.

This study explored the social influences on SoCeL environment in higher education by examining the interactions between students and lecturers. Students interact with other students, lecturers, and with the external world. Why and how do these interactions occur

within the institutions under study? The following sections discuss social and collaborative interactions among students and lecturers – why they occur and how they influence the learning process.

5.6.1.1 Interactions and collaborations

Social interaction among individual members of a community is an important building block for improving communication and service for that community (Jankowska and Marshall, 2004). By interacting with one another, people develop rules, ethos and characteristics of the institution, class, and systems within which they seek to live. Social interaction therefore determines the culture which also shapes the way communication and business in that community is done.

In a higher education community where learning is a central activity, it is important to study social interactions between the groups, for example, student-lecturer or student-external world, in order to understand the objectives and nature of these interactions and to determine the extent to which they facilitate informal and formal learning processes. Some student-student interactions are aimed at collaborative learning. Students reach out to each other to solve problems and share knowledge hence broadening their learning and deepening understanding in what is referred to as constructivist approach to learning.

Collaboration is a practice involving individuals working together towards a common goal to the benefit of the community as they learn from each other and construct their own knowledge (Beldarrain, 2006). In higher education institutions in Uganda, collaboration between individuals or groups is commonplace especially for those undertaking distance learning as students form discussion groups (Mayende, 2007; Basaza et al., 2010) and capitalize on one another's resources and skills, for example, by asking each other for information, evaluating one another's ideas, monitoring one another's work. Collaborative learning therefore allows two or more individuals to learn something or work toward a common learning goal together (Chiu, 2008).

Rooted on Lev Vygotsky's (1978) concept of zone of proximal development, this learning approach is based on social constructivist learning theory which emphasizes that knowledge can be created within a community where members actively interact by sharing experiences whilst taking on asymmetry roles (Mitnik et al., 2009). A collaborative learning therefore requires an environment in which students engage in a common learning task where each individual student depends on and is accountable to each other to search for understanding, meaning, or solutions or to create an artefact or product of their learning.

The mechanisms employed in this learning approach may include both face-to-face conversations and electronic discussions using such tools as online forums, chat rooms, and group pages. Understanding the nature of collaborations within different individuals and groups helps in shaping the design of learning environment in which student engagement is central. The following sections present the result of a study exploring the social interactions and collaborations among students and lecturers in two universities in Uganda in order to determine how they shape SoCeL environment.

5.6.1.2 Reasons for interaction outside classroom

In this section, the discussion on the motivation for social interactions within the learning environment is presented. The discussion is to explore the findings of this study (as summarized in Figure 5.1) in relation to what exist in literature. There are several reasons mentioned in the literature for students and lecturers to engage in social interactions outside the classroom environment.

Social interactions outside the classroom, especially between students and lecturers, may be for the purposes of communication, asking for help, making excuses, or making formal requests (Bloch, 2002) and occur through face-to-face, or online using email, social networking tool, or learning management platform.

Even if they occur outside theclassroom, interactions between students and their lecturers enhance formal and informal learning. For example, a study by Bloch (2002) on the student-teacher interaction via the e-mail showed that students use a variety of rhetorical strategies to achieve their objectives and exhibit ability to switch between formal and informal language, depending on the rhetorical context of their message.

There are several reasons why the students and the lecturers engage in social interactions outside the classroom whilst examining how they facilitate learning and whether these support environments for SoCeL. The participants (n=583) were asked about the purpose of their social interactions outside the classroom setting. From the results shown in Figure 5.1, the main purpose for social interaction among students and lecturers of the two institution studied (Makerere university and the Uganda Christian university) was discussing assignments or class work although participants did also indicate that they interacted to express their own opinions and facts, engage in other social activities, as well as share their own past experiences, which are instrumental in fostering informal learning process especially whereby students learn from each other, lecturers, and the external world with whom they have contact outside classroom.

What these findings presented here suggest is that the classroom activities are extended to times outside the formal class time, which is in line with what Bloch (2002) describe as "achieving their objectives" of coursework assignment, which is to scaffold the learning process. In doing so they choose to engage each other and express their opinion freely in an informal manner, engage in other social activities, as well as share their own past experiences, which also confirm Bloch's (2002) argument regarding exhibiting ability to switch between formal and informal learning and socialising the learning process.

5.6.1.3 Socialising learning

Quite often, when people talk about socialization, many consider meeting friends over drinks and sharing a good laugh. However, socialization during the learning process involves engagement, interaction, and collaboration with other people and therefore enhances learning. Socialization is therefore a process and is continuous throughout our whole lifetime: for example, when one finds him/herself interacting with other people with unfamiliar cultures. In which case he/she gets to learn more about the new culture and become more acceptable.

Another example, when you join a new social group in your own culture there may be a need for you to adjust to new ways of behaving. It therefore demonstrates that learning is a lifelong process that occurs as we interact and work with other people. Socialising learning therefore means that learning is made part of social activity.

Learning, being a social activity (Stamps, 1997), means that students and lecturers are involved in social interactions and collaboration as the student learn more whilst they work with other people. Although the external world (other than the students and lecturers) does interact with students and lecturers during the learning process, this study reveals that interactions and collaborations occur predominantly among students themselves (see Table 5.6). This is partly because through socialization of learning, students learn also to function as members of their social community – the class to which they belong.

The following sections highlight the inter group and intra group social interactions and collaboration contexts basing on the study conducted on students and lecturers.

5.6.1.4 Lecturer-student interactions

Interaction between lecturers and students is essential for mediating students' learning, especially in the case of dialogic interaction, where students' content comprehension is boosted as this enables students to take a more active role in the learning process (Navaz, 2013). For example, in collaborative learning environment in which students work cooperatively together, their thinking and learning is stimulated and extended by the lecturers

who encourage them to engage in reciprocal dialogues where they exchange information, explore issues, interrogate ideas, and tackle problems in a cooperative environment that is supportive of these discussions (Gillies, 2015). This is possible when the lecturer takes an active part, in such dialogues involving both students and lecturers. In this case, the lecturer plays a key role in prompting and mediating - leading students to ask and answer questions, enabling them to learn how to engage in reasoned argumentation where they are required to investigate topics (Gillies, 2015).

In order to achieve the full extent of dialogic lecturer-student interaction, a lecturer's supportive role, in prompting and mediating, requires him or her to become an 'informal educator' (Jeffs and Smith, 1999; Otto and Williams, 2014b) so as to ensure that the culture of interactions and collaboration is built and maintained in and outside the classroom environment with greater freedom and participation of the students even within informal settings. Navaz (2013, p.117) defines dialogic interaction as "a mutual dialogue that takes place between a lecturer and students in which both mutually contribute to the discourse with a view of exploring or developing a concept in a lesson". This makes it possible for a dialogic interaction to be a confidence building approach. When students are involved in two-way discussions with their lecturers, whether in the classroom or outside classroom, their confidence and interest in the subject are likely to be boosted and so is their content (lecture) comprehension where the lecturer's teaching style is influential (Navaz, 2013).

It is worth noting also that interactions and collaboration between lecturers and students may be affected by negative cultural practices and perceptions such as, "culturally-embedded behaviour perpetuated by senior students, known as ragging (a kind of bullying)" (Navaz, 2013) and views held against female students interacting with male lecturers. Because of such negative influences, classroom interactions between lecturers and students can be limited.

This study showed that only 36% of the students surveyed, interact with their lecturers. Using the *Chi* square test of independence with α = 0.05 as criterion for significance, it was established that more than two thirds (67%) of female students didn't interact with lecturers compared to just over a half (55%) of the male students who didn't interact with their lecturers. These differences based on gender were significant ($\chi^2(2, N = 571) = 8.905, p < 0.02$), to make a case for further investigation using interview.

Some of female students who took part in the interviews indicated that they would rather "keep their boundaries" while interacting with a lecturer in the classroom and more preferably "go to his office and talk to him officially" to avoid "misinterpretation" – thinking

that there is an unofficial relationship. However, male students reported to be more free to interact with their lecturer both face-to-face, outside classroom or over the Internet as one of them said in this interview transcript when asked about how freely he would interact with his lecturer outside classroom:

> We are free to interact with lecturers; we meet with them in the corridors, we joke, we share things…we can approach them after lecture if we don't understand anything. Personally I have done that. For example, if a lecturer says something wrong like harass someone in public they can go and settle the differences together… I am a friend to many of them on Facebook. (Student 12, male)

This student's response alludes to the fact that when students feel the need, such as boosting their lecture comprehension (Navaz, 2013) and relationships, they can initiate interaction with their lectures whether through face-to-face or online. By be-friending a lecturer on social networking tool, for example, students feel freer to virtually interact with their lecturers.

Another reason that encourages students to interact with their lecturers outside classroom is the opportunity to individually and privately express themselves without fear of doing so in class where everyone can hear. Meeting a lecturer privately encourages a student to seek personal attentional in boosting the content comprehension. Take for example, this interview transcript describing why it is important to informally interact with a lecturer outside classroom:

> Some students may be shy and yet they may want to direct some personal questions to the lecturer out of class. It also feels good (Student 11, male).

What this means is that shy students would benefit more if there were opportunities for them to express themselves more privately outside the classroom setting. In order for the student-lecturer interaction to be helpful, the lecturer should be able and willing to change to role to informal educator (Jeffs and Smith, 1999) and create environment to foster this interaction. Unfortunately, not all lecturers are willing to fully provide such an environment. Previous studies also show that student perceptions of a lecturers' credibility and their reports of motivation and affective learning may also be affected by what the lecturers discloses about themselves (Mazer et al., 2007). This may contribute to the reluctance of the lecturer fully provide dialogic interactive learning environments.

This study also reveals that although every lecturer would prefer to interact with other lecturer outside classroom, 15% of lecturers didn't prefer to interact with their students

outside classroom yet classroom interaction is limiting in many ways as heighted already. With the availability of online social networking tools (SNTs), however, interactions and collaboration could be made easier due to a number of features within these SNTs that facilitate personal and group level participation both synchronously and asynchronously. Chapter 6 explores adoption of these tools by students and lecturers and explain how they actually use them to support educational activities.

5.6.1.5 Student-student interaction and collaboration

Interaction and collaboration among students is a vital part of the learning process, creating a true learning community in support a of constructivist environments (Beldarrain, 2006). In a traditional classroom setting, interaction happens naturally, as students listen to each other's comments, ask each other questions, and build rapport through frequent contact. However, in an online environment, lecturers can also foster student-student interaction if they recognise the role of informal learning (Otto and Williams, 2014b) to integrate formal and informal online interaction opportunities in their design.

Student-student interaction is more common than student-lecturer interaction as illustrated in Table 5.6 in section 5.4. When the course is delivered through the face-to-face mode, students prefer to meet outside classroom and discuss or consult with each other. This can be different in the case of a virtual classroom where students don't meet physically but through electronic means.

A large part of what goes on between students and their fellow classmates is to do with 'training' students in the way of the culture of the class, as well as in ways of relating to others. Student-student interaction is partly a process of learning and partly a process of being taught, but involving active role of students in making sense of their social world, and constructing their own ways of being part of their social group.

Classes where students have opportunities to communicate with each other could help them to effectively construct their knowledge and share responsibility for learning with each other whilst discussing divergent issues that relate to their learning. Just like lecturers, students seem to prefer socialising with fellow students as found out in this research as explained below.

The results in this study revealed that the in-group or peer interaction (for example, among students themselves) is dominant compared to across group (for example, between students and lecturers). At least 98% of the students reported that they interact with fellow

students while 36% and only 9% reported to interact with lecturers and others respectively as summarized in Table 5.6.

5.6.2 Technological environment

The technological context of a SoCeL environment refers to the aspect of using information and communication technologies (ICTs) to achieve interactive and collaborative learning. The use of ICTs in learning environments has widely increased over the last decade (Farrell et al., 2007), becoming a significant part of many universities' curriculum delivery and they have become necessities for both lecturers and students to aid in the learning process (Parai et al., 2014), which may also be known as e-learning. e-Learning is defined as the use of ICTs to mediate the process of learning, normally asynchronously and synchronously. The technological foundation of e-learning is the Internet and associated ICTs (Garrison, 2011).

When e-learning was first introduced in the mid-1990s, it was focused on non-real-time (asynchronous) text-based communication between lecturer and student (Haythornthwaite and Andrews, 2007). The use of the learning management systems (LMS) in which courses are formally organised and accessed online by the students later became widely used. However, active participation and collaboration by students and lecturers using this platform has been largely limited because of its 'read-only' nature (Poore, 2013).

On the other hand, the social networking tools (SNTs) provide students and lecturers with the social and collaborative learning capabilities for them to get connected and networked together to create, collaborate, and contribute their knowledge in an environment which is nimble, flexible, and easy to use (Cheung et al., 2011; Poore, 2013). This may explain the wide adoption of the use of social networking tools by university students and lecturers in supporting their educational activities.

These developments in e-learning have drawn a research focus to SoCeL, which is aimed at achieving a social constructivist approach to e-learning. An effective SoCeL environment must address the technological context in the sense that learning materials ought to be accessed by the students anytime and from anywhere and there should be an opportunity for them to actively interact and collaborate. An ideal SoCeL environment should therefore combine the advantages of LMS and social networking tools. There are two perspectives of SoCeL implementation; 1- extending the LMS to provide support for interaction and collaboration; 2- using SNT to as a LMS to support of educational activities

in formal and an informal way (Idris and Wang, 2009; Mao, 2014; Kabilan et al., 2010; Conole, 2010).

This section highlights the findings on the use of LMS and SNT by students and lecturers and whilst examining their expectations for an ideal environment for SoCeL.

5.6.2.1 Using learning management system

Learning management systems (LMS), such as Moodle, were developed based on the first generation of the Internet which provided read-only access to information; therefore its use was focusing mainly in providing access to learning materials whilst supporting asynchronous student-lecturer communication (Poore, 2013).

Makerere University uses a Moodle-based e-learning system referred to as Makerere University e-learning environment (MUELE), which transitioned from the proprietary/licensed Blackboard LMS. MUELE is a LMS through which students can access learning materials and activities made available by the lecturers. Students are required to create and validate their account on the MUELE website before accessing learning materials and activities.

Having been set up in 2009, the number of users has grown with over 40,000 users as of March 2014. With MUELE, the lecturer can make available to students, course files, discussion forums, quizzes, assignments, wikis, course information, and updates as may be relevant to the lecturer. However, many of the students and lecturers interviewed in this study indicated that students preferred to use social networking tools compared to the LMS. This is in line with as findings is a study by Parslow et al. (2008) which suggested that LMS platforms such as Blackboard and Moodle "tend to be implemented in a top-down fashion, with the institution providing the tool to the students and instructing them to use it". The study claimed that students adopt a more informal, bottom up approach of using social networking tools such as Facebook and Twiiter. It is clear from the following interview transcript in which one of the lecturers interviewed explained that students opted for Facebook group instead of using MUELE:

> We introduced a group of students to MUELE and then we created the Facebook group
> and started sharing information on both and the majority preferred the Facebook.
> Actually I still remember one comment from a student. He said "MUELE is so far,
> Facebook is very near" why, because they could use their phones for Facebook
> (Lecturer 1, male).

What this lecturer did in this case was to avail to the students both MUELE and Facebook as the alternative approaches to SoCeL. Because Facebook does better in connecting students and lecturers, students feel that it is more social, can be accessed at any time, and anywhere and therefore improves their interaction and collaboration. One of the students described Facebook as friendly since it makes personal appeal in terms of the interface. If MUELE is accessible through mobile app then there is a possibility of students liking it as they prefer access through their mobile devices.

According to the lecturer (quoted as Lecturer 1), the Facebook group, to which he is also a member, enabled students to share contacts, pictures, course materials, and other information with each other, including those outside their class. In fact, he (the lecturer) also posted relevant information to the group. This lecturer's experience demonstrates the impact of social networking tools on the LMS implementation. This experience is similar to that at Uganda Christian University where the LMS is either unliked by individual lecturers or not available at all. One of the lecturers who was interviewed expressed ignorance about the existence of LMS at UCU. According to him (in the interview transcript below), there has not been any exposure to LMS platforms used at the university:

> "I have not even been exposed to that Moodle and Canvas but in a university in Missouri, USA where I visited last fall, we were introduced to a LMS where the lecturers post notes on blackboard. I wish it could be here because when I look at this master's programme which is very ambitious with theory being covered in one year, I would recommend that such thing as blackboard would come and people would post their notes on blackboard even assignments" (Lecturer 13, male).

The expression of this particular lecturer shows that some lecturers are not aware of the LMS that the university has adopted yet they would be happy to use it. However, those who have had a chance to use LMS, express their dissatisfaction with it and would rather prefer to use email or social networking tools. Another lecturer mentioned (in the transcript below) that group email was preferred for class interaction other than LMS:

> "I make sure that every class I teach have a group mail so we use that mail for interaction. They send me a request, I join it and become a group member and if there is some reading material or assignments for them, I can easily send to the group

email. But usually, I ask them to use their own email when sending their coursework"
(Lecturer 23, male).

According to this lecturer, email was the most valuable tool compared to the LMS. In fact, LMS is not widely used in both institutions and some of the lecturers hold negative attitudes towards using that platform. A lecturer at UCU cited the unattractive user interface as one of the negative factors limiting the use of LMS as he explained in the following transcript:

"The learning management system I have interacted with have not been so catchy, not interesting, a little complicated, too crowded and you may lose important information with information- making it difficult to navigate through it will take you a lot of time thus becoming less helpful" (Lecturer 6, male).

The problem of an unfriendly user interface was also echoed by other participants. In his view, the lecturer regards LMS as addition to the problem of information overload and lack of motivation. This is why he thinks social media is better than LMS as he further explains in the transcript below:

"When you look at the social media, you will find that they capture the interest of the users in the sense that users and made to feel they are in the technology unlike what we are seeing in the learning management systems" (Lecturer 6, male).

What this lecturer mentions is similar with the view held by students that social networking tools are easy to use and more user friendly and therefore provide better approach to SoCeL.

The subsequent section, explains the emergence of these social networking tools has had an impact on the e-learning implementation within higher education, which has also resulted into an immense demand to extend the LMS in support of a social constructivist approach to e-learning (Dalsgaard, 2006). As such, e-learning has been evolving to provide a more interactive and collaborative platform for students and lecturers.

5.6.2.2 Using social networking tool

The growth and popularity of online social networking tools, especially within higher education, has created a new opportunity of social interactions and collaborations among students and lecturers to socialize, communicate, and work together towards common goal. More than a billion individuals around the world are connected and networked together to create, collaborate, and contribute their knowledge and wisdom (Cheung et al., 2011). In

Uganda, like other African countries, social networking tools are used in support of e-learning. This ranges from official use (Otto and Williams, 2014a) to individual private usage where by institutions use them to pass on marketing information, the lecturers use them for posting course announcement and materials and the students use them for accessing information as well as for individual and group interactions (Otto et al., 2015).

Because of their collaborative and interactive features such as Facebook group, the use of a social networking tool as a learning management system has been implemented in higher education in Uganda and other developing countries although there remains a number of challenges that hinder their full utilization (Munguatosha et al., 2011). These ubiquitous tools have been largely used by students to connect to each other as well as to lecturers and other external people.

The affordances of these new, ubiquitous and powerful social networking tools have quietly established e-learning approach in higher education (Garrison, 2011) where by students and their lecturers use them for educational purposes. One of the lecturers noted in the following interview that Facebook, for example, help students to interact with their lecturers and express their own opinions on matters that concerns them:

> The other day, I received a communication—from a friend who had been on Facebook—that is related to my department, students were complaining about a policy…so she said to me this and I said: "If she was not on Facebook, I wouldn't have known?" She is able to interact with her students. Some of them are able to post their views on Facebook (Lecturer 6, male).

The expression made by this lecturer alludes to the fact that social networking tools are very instrumental for accessing information and connecting to other students and lecturers. Those tools can also be used to support a lecturer's role in developing personalised learning activity for his or her students as mentioned in the following interview transcript by one of the participants:

> Social media provides the opportunity to enhance teaching. If it can identify the type of the student and identify their likes, probably in using the media platform they can address what they intend to use it for appropriately. It would be very interesting. (Lecturer 23, male)

This assumes that lecturer will take time to view and study every student's profiles. Social networking tools provide larger audience from which individual students construct personal meanings and confirm mutual understanding. This means that regardless of time and space, learning can happen as depicted in the interview transcript below:

Social media would mean that we would have a larger audience; you would learn at any time of the day or night; you would be able to learn even more from each other than if you were in the classroom or in a lab. The time does not matter, the where does not matter (Lecturer 5, male).

Learning from each other and being able to connect with each other is a powerful future supporting social constructive approach to e-learning.

5.6.3 Pedagogical environment

Pedagogy may be "construed to refer to the forms social practice which shape and form the cognitive, affective, and moral development of individuals and influence the formation of learning outcome" (Daniels, 2002). This can be extended to include the methods and practices of delivering learning materials for a subject or theoretical concept. This definition emphasizes the methodological approach to teaching and learning, in other words, how the learning materials are delivered by the lecturer to the student and how the learning materials are accessed by the students whilst examining the role of students and lecturers, and the source and type of learning material.

It is important to know that involving lecturers in social interactions with students encourages informal learning. These interactions (which may also involve the external world) encourage informal learning, which can be integrated into the formal educational setting to enhance attainment of formal educational goal (explained further in the subsequent section).

The previous study (by Otto and Williams, 2014b) on informal learning, explained the theoretical role of informal learning practices and strategies that can be used as a scaffold in building SoCeL environment. In this case the lecturer's role in supporting informal learning must be flexible and change from formal to informal (Jeffs and Smith, 1999) in pursuance of strategies proposed by (Otto and Williams, 2014b).

5.6.3.1 Learning material

As discussed earlier (in 5.6.3), the role of the lecturer is to provide an appropriate environment or to enable access to learning materials by students. Students can access learning materials in a formal or informal mode depending of the technological and cultural contexts. This may be formally; organised materials deposited into the learning management system or informally, unorganised materials available from social networking tools or from the external world.

Whether formally or informally available, the lecturer's role is to ensure that there is the environment for suitable learning materials to be accessed online by the student. A variety of materials including lecture notes, reference texts, announcement, assessment, etc., can be made available to students.

5.6.3.2 Formal learning

Online formal learning is the learning that takes place in an "institutionalized, chronologically graded and hierarchically structured educational system" (Coombs et al., 1974) with a prescribed learning framework (Eraut, 2000) whereby students access materials that have been formally organised in a standardised curriculum normally implemented in LMS.

LMS is a software package that allows the lecturer to create, administer, document, track, report and deliver e-learning courses. The lecturer can therefore deliver formal learning materials to for students to access from anywhere on any device. The result of this study shows that both of the universities don't have a very effective implementation of LMS. Consequently, only a few formally organised courses have been delivered using LMS and the majority of the courses are delivered through face-to-face formal classroom. Most of the online learning occur in an informal way.

5.6.3.3 Informal learning

Online informal learning occurs throughout our life and without any prescribed learning framework. It results from daily life activities related to work, family or leisure and in most cases occurs unintentionally to the extent that the student may not even be aware that learning has occurred (Ainsworth and Eaton, 2010; Gear et al., 1994; Vivian, 2011). This mode of learning is not structured (in terms of learning objectives, learning time or learning support) and typically does not lead to certification (Schugurensky, 2000).

Although, to some extent, it may be an intentional endeavour, in most cases it is without deliberate intent or "incidental" (The EC, 2010). Recent studies show that blending

informal and formal modes of learning may be useful in achieving SoCeL in higher education especially where informal learning strategies are adopted as scaffold for formal educational goal, having six informal learning scenarios in which various online and face-to-face informal activities can be integrated in the design of formal educational programme (Otto and Williams, 2014b).

The focus of this study was therefore to explore the role of informal learning as a scaffold for formal education whilst examining how students and lecturers engage in informal learning activities and the opportunities available within their institutions with the view of establishing what activities and tools can be integrated in the design of formal educational programme in support of SoCeL in higher education. Table 5.13 below summarizes the informal learning scenarios (Otto and Williams, 2014b) which can be set up within the formal educational design using available features of social networking tools in support of SoCeL adoption.

From Figure 5.4 in section 5.4, the most common practice is chatting and sharing information with each other. What is important about this finding is that there are a number of informal learning activities that can be integrated within the formal programme.

Table 5.13 Informal learning scenarios to support formal learning

Informal learning activities	Technological features available from the platforms most commonly used
Making friends	User profile, friends list, the
Chatting	Message
Sharing information	User profile, sharing links, commenting, the wall, pokes, status,
Learning	Group, Forum, photo, video, events
Collaborating on group work	Group, video, like
Giving feedback	Message, group, forum
Seeking information	Status update, group, message, forum
Brainstorming	Group message, forum
Checking other friends' profiles	User profile
Entertainment	User profile, photo, video
Getting news	News Feed
Contacting and interacting with lecturer/student	Message, group

5.7 Chapter summary

In this chapter, the SoCeL environment was explored in terms of its delivery of learning materials and learning contexts and what this means for the universities that were under study. A SoCeL environment is defined to include method of delivery, social, technological and pedagogical contexts. In terms of delivery method, the finding that this study presented is that students and their lecturers prefer to have a blended approach even though the current dominant method has been face-to-face in the face of challenges of implementing a blended learning environment. This finding confirms the positive view held about the blending online learning with face-to-face as has been the case with The Mountains of the Moon university in Western Uganda (Justice and Zhu, 2015).

SoCeL represents an approach to e-learning innovation in higher education with a focus on understanding the affordances of new technologies and their ability to create and sustain a learning community which centres on interaction and collaboration. For this to be successful, the culture that promotes active involvement of students, lecturers and the external world should be nurtured. The nature of interactions between students and lecturers and how culture shapes pedagogy and the use of technology was also explored. The findings from this study showed that student interact more among themselves than with the lecturers or external people. Other findings in regards to interactions and collaboration were also presented.

In terms of technological context, the findings highlighted the technological innovations shaping the delivery of material. The rapid changes in this aspect correspond to the changes in the information and communication technologies especially the Internet and the social communication tools. The first approach to e-learning with the advent of the Internet was the learning management (LMS), which was mainly used for accessing learning materials but this lacked the ability for engaging students actively and in a synchronous manner. With further innovation and the introduction of interactive Web, social networking tools emerged and infiltrated higher education. Students and lecturers embraced these for their educational use even though they weren't meant for that. These tools were used mostly for connecting students to lecturers and to external world. SoCeL environment aims to provide access to learning materials as well as connecting students to the external world. That is, supporting both the use of LMS and SNT.

In terms of pedagogy, this chapter explored how learning materials are accessed by students in both an informal and formal way. What a SoCeL environment focuses on is the blending of informal and formal approach. The results present here illustrate how the learning

trend tends to show how informal learning can be integrated in higher education system in order to harness the informal learning strategies as scaffold for formal educational goal.

In a nutshell, in order to determine what social collaborative technology students and lecturers choose and how they interact with the tool depends on SoCeL environment characterised by method of learning delivery and the contexts in which interaction occurs. In the next chapter the adoption of such tools is presented.

Chapter 6

Adoption of Social Collaborative e-Learning

6.1 Introduction

This chapter looks at the adoption of SoCeL using the data obtained in two universities in Uganda through a survey in which 545 students and 43 lecturers responded, and 31 interviews conducted with students, lecturers, and the university officials. The analysis presented here is based on technology acceptance model (TAM) as a theoretical framework.

TAM as explained in section 2.7 in Chapter 2, is a theory that is used within a wide range of research fields to predict and explain user acceptance or rejection of technology. TAM suggests that the actual use of technology is predicted and explained by user motivation, which in turn is directly influenced by an external stimulus consisting of the actual technology features and capabilities (Chuttur, 2009). This means that in order to explain and predict the adoption of a technology, one needs to understand three aspects of technology adoption: the external factors influencing the user's motivation, the internal factors determining the user's motivation, and the actual usage of technology as a result of the user's attitude towards using that technology.

These three aspects of technology adoption form the sub-themes covered in this chapter: external factors, user motivation, and the actual use of social collaborative technology by students and lecturers. First, key findings are presented in section 6.2 and this were followed by a discussion in sections 6.3, 6.4, and 6.5 and a summary in section 6.6. These findings resulted from a mixed method of qualitative and quantitative data analysis using NViVO 10 and IMB SPSS 21. A hybrid approach for thematic and content qualitative analysis involving both deductive and inductive coding and theme development (Fereday and Muir-Cochrane, 2006) was employed.

The initial themes (or coding categories) and sub-themes were formulated based on theoretical ideas and previous research findings using the 'directed' approach of qualitative analysis. This qualitative data analysis process starts with a theory or relevant research

findings as guidance for initial codes (Hsieh and Shannon, 2005) following a deductive reasoning, resulting in an analysis structure operationalized on the basis of previous knowledge (Elo and Kyngäs, 2008). This theory-driven analysis is guided by specific ideas or hypotheses the researcher wants to assess (Fereday and Muir-Cochrane, 2006). In this case, the initial codes (such as external factors, user motivation, and actual use) were based on the technology acceptance model (TAM). The sub-themes (such as social, demographic, individual, and infrastructure factors) were based on related research findings. Having these theoretically derived themes or sub-themes are important because they allow replication, extension, and refutation of prior discoveries (Boyatzis, 1998). Therefore, TAM is used in this study to explore the adoption of Social collaborative technology with the aim of explaining use of social collaborative technologies and predicting what works for higher education in a developing country.

The adoption of Social collaborative technology is important as a social constructivist approach to educational technology within a university setting and in this chapter, TAM is used to explore why and how the students and the lecturers are adopting social collaborative technologies that support SoCeL.

The actual use of social collaborative technologies by the participants are explored to try to understand what this means for a university in a developing country. This is to provide basis for designing a model to guide effective integration of SoCeL in higher education.

6.2 Key findings on social collaborative e-learning adoption

These findings were based on the data obtained through a survey questionnaire and a series of interviews. In order to explore the adoption of SoCeL within the two universities considered in this study, the focus was on determining the external and internal factors that influence the adoption and the actual use of social collaborative technologies by students and lecturers. According to TAM framework, there exist relations between these factors and the actual adoption of the tools.

As explained in Section 5.2 of Chapter 5, there were 31 questions in the questionnaire that was sent out to the students and the lecturers and this was followed by a series of individual and group interviews. A total of 588 participants responded to the questionnaire although not every one of them answered all questions in it. The data presented in this chapter were obtained from the responses to questions related to the participants' use of social collaborative technologies. Further data came from the follow-up interviews.

The findings have been categorised into three broad themes based on the TAM framework: external factors for SoCeL adoption (section 6.2.1), user motivation for SoCeL adoption (section 6.2.2), and Actual use of social collaborative technologies (section 6.5). In the subsequent sections, each of these three themes are discussed in detail to specifically explain how the various factors might influence SoCeL integration. Meanwhile, the relationships between these factors are further analysed in the concluding section (6.6).

6.2.1 External factors for SoCeL adoption

One of the objectives of this study was to establish the external factors responsible the for adoption of SoCeL in higher educational institutions from the developing country's perspective. To achieve this, a mixed method approach involving use of survey questionnaire and a series of interviews was used.

The students, the lecturers, and the university officials were asked about themselves and their use of social collaborative technologies in everyday life. The responses of the participants provided both qualitative and quantitative data that were analysed and grouped into four emerging sub-themes, which constituted the factors responsible for adoption of the use of social collaborative technology by the students and the lecturers.

As stated in section 6.1, the sub-themes as illustrated in Figure 6.1 were based on related research findings. External factors that potentially influence adoption of SoCeL include social effect (Lin and Bhattacherjee, 2008), demographic effect (Quazi and Talukder, 2011), individual effect (Lewis et al., 2003; Dupagne and Salwen, 2007), and infrastructure effect (Munguatosha et al., 2011).
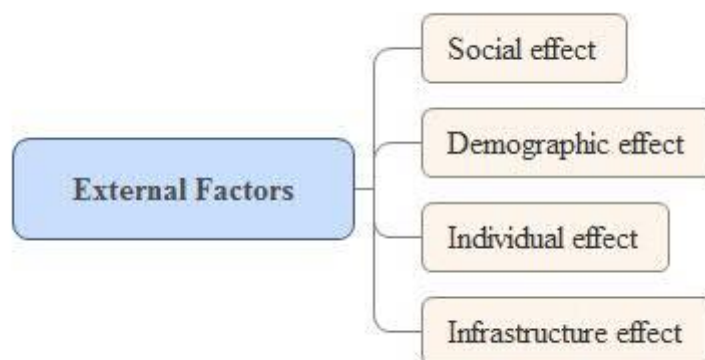
Figure 6.1: External factors for SoCeL adoption

Social effects result from social factors which determine how users interact using the social networking tools. According to Lin and Bhattacherjee (2008), users derive utility from social effects. For example, the more friends that adopt a social networking tool, the more users can maintain or develop their individual social network, thereby increasing the motivation to use that tool for learning support. This also explains why some social networking tools are popular among particular social groups. Figure 6.2 illustrates sub-themes that emerged from the responses given by the participants on the question about why they used social collaborative technologies. Using the inductive approach of qualitative content analysis, various sub-themes were identified and matched with the four themes (mentioned earlier in this section) within the 'external factors' category. The inductive approach involves identifying themes or sub-themes directly and inductively from the raw data (Zhang and Wildemuth, 2009). These sub-themes, namely; number of peers (Lin and Bhattacherjee, 2009), social platform (Lin and Bhattacherjee, 2009), enjoyment, social presence (Nadkarni and Hofmann, 2012), and social influence, constitute social effect responsible for SoCeL adoption and they were initially identified through inductive data analysis then matched with the sub-themes that were identified deductively before confirming them as illustrated in Figure 6.2.
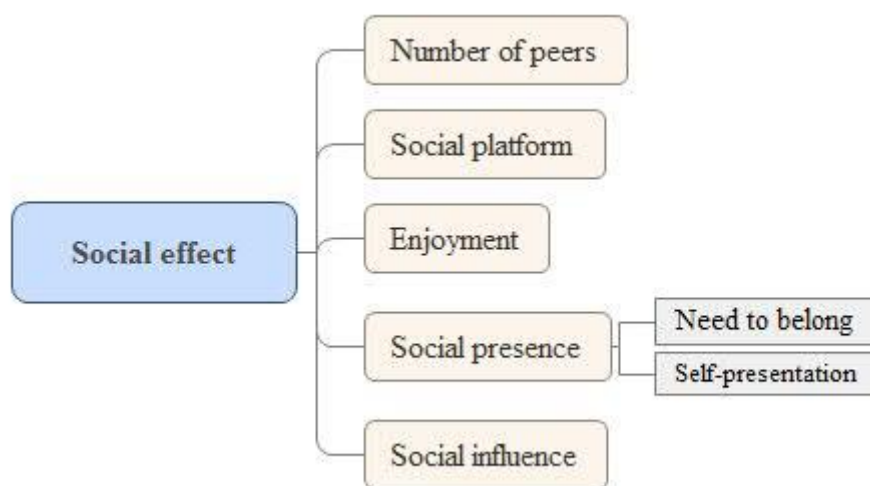
Figure 6.2 Social effect of SoCeL adoption

Demographic effects relate to the cultural and natural attributes (such as age and gender) of a user, which determine an individual's adoption of SoCeL. Generally, "demographic and cultural factors contribute to the *need to belong*, whereas neuroticism, narcissism, shyness, self-esteem and self-worth contribute to the need for *self-presentation*" (Nadkarni and

Hofmann, 2012). This suggests that they are contributors of social effect on the adoption of SoCeL. Figure 6.3 illustrates the factors identified through a deductive thematic analysis process based on the Studies (Quazi and Talukder, 2011; Dupagne and Salwen, 2007), which have shown that demographic factors determine an individual's adoption of technology. Institution of affiliation, age, gender, qualification, and status (student/lecturer) were thus considered in this study as contributors of social presence factor for adoption of SoCeL.
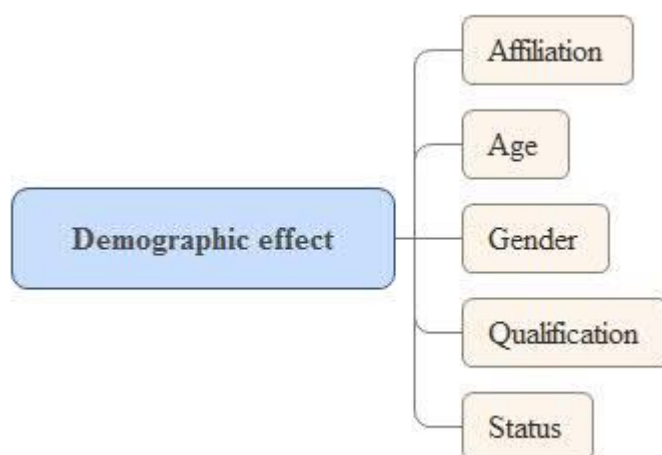
Figure 6.3 Demographic effect of SoCeL adoption

In this study, the following individual factors; experience, time spent online, enjoyment', and ownership of ICT device, emerged as sub-themes from the deductive content analysis based on the previous studies (Munguatosha et al., 2011; Talukder, 2012; Talukder and Quazi, 2011; Dupagne and Salwen, 2007; Venkatesh and Davis, 2000; Lewis et al., 2003); These factors (in Figure 6.4) were investigated to determine their effect on the user's motivation to adopt social collaborative technologies.

Individual effects relate to the belief, ability, or capacity of an individual which might have influence on his or her adoption of SoCeL. Lewis et al. (2003) argues that an individual's beliefs about technology use have an impact on subsequent behaviours toward technology. This refers to individuals' cognitive interpretations of innovation and themselves. Talukder's (2012) review of earlier works found that individual factors such as prior experience, and enjoyment with innovation have stronger influence on an individual's adoption of technology (Venkatesh and Davis, 2000; Dupagne and Salwen, 2007). It has been shown, for instance, that a relationship exists between early adoption and socioeconomic status of an individual (Dupagne and Salwen, 2007).
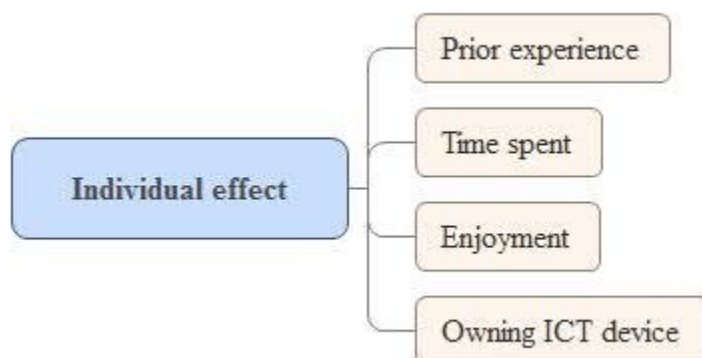
Figure 6.4 Individual effect of SoCeL adoption

Lastly, regarding infrastructure, as shown in a study by Munguatosha et al. (2011), factors relating to ICT infrastructure such as lack of reliable power supply, poor Internet connection, and limited supply of devices, are major constrains for adoption of SoCeL. Infrastructure effects relate to the factors relating to the provision and utilisation of the ICT facilities especially the Internet. Having reliable infrastructure to support use of the Internet, for example, is an important factor in adoption of any technology (Lee and Kim, 2007).

This study therefore, focused on establishing how Internet access affects the adoption of SoCeL (see Figure 6.5) having deductively identified this as a measure for infrastructure effect. Internet access was measured in terms of frequency (that is, whether or not participant accessed Internet on daily basis) and the means of accessing it (that is, what device or network type an individual accesses the Internet).
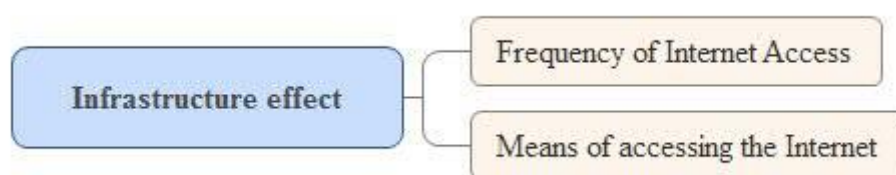
Figure 6.5 Infrastructure effect of SoCeL adoption

6.2.2 User motivation for SoCeL adoption

User motivation for SoCeL adoption refers to the factors that internally influences an individual's use of social collaborative technologies. It represents an internal process, which

cannot be directly observed but it can only be inferred by noting behavioural intention or an action by a user. Motivation theory has been widely used to explain individual's adoption of technology (Lin and Lu, 2011). Deci (1975), also cited in Lin and Lu (2011), categorised the motivations underlying individual's behaviour into extrinsic motivation and intrinsic motivation.

In this study, the TAM framework is used to define user motivation in terms of three constructs as illustrated in Figure 6.6; perceived usefulness, perceived ease of use, and attitude toward using.
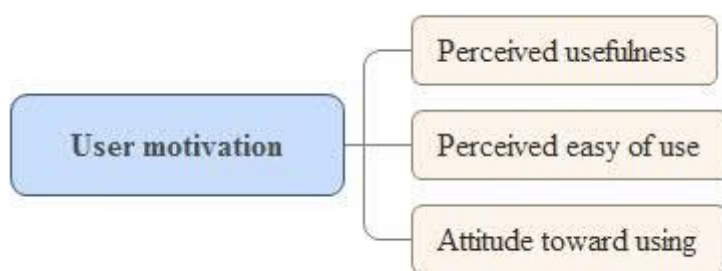
Figure 6.6 User motivation for SoCeL adoption

Perceived usefulness of social collaborative technologies refers to how a user perceives a particular tool to be useful to him or her in boosting the learning process. Lin and Lu (2011) have shown in their study that an individual's perceived usefulness of a particular technology has a great positive influence in relation to adoption of it. Davis (1989) argues that people tend to use or not to use a particular technology to the extent they believe it will help them perform their work better.

The postulation by Davis about perceived usefulness is in line with the *Oxford English Dictionary* online (1596) definition of "useful", which means capability of being put to good use. Participants were asked to describe how they perceived the usefulness of social networking tools for learning purposes. Table 6.1 presents the summary of their responses. The results show that more than 96% perceive these tools useful in supporting their education activities

Table 6.1 Responses on the usefulness of social collaborative technologies

Response	f	%
Very useful	332	60.4
Useful	201	36.5
Not sure	11	2.0

Not useful	6	1.1
Total	550	100

Perceived ease of use of social collaborative technologies is the extent to which an individual believes that using a particular tool will not challenge him or her cognitively. In other words, an individual's belief about having adequate skills to make the usage easier and enjoyable. Since an individual's motivation to adopt a particular tool cannot be measured but rather inferred by noting his or her attitude toward using it (Davis, 1989), this study focuses on individual's Internet skills, which can influence the motivation to adopt SoCeL. Figure 6.7 illustrates the percentages of participants with perceived individual Internet skill in four levels, from low to high namely; "learner", "intermediate user", skilled user", and "advanced user". The results show that more than 68% of the participants described themselves either as "skilled user", or "advanced user".
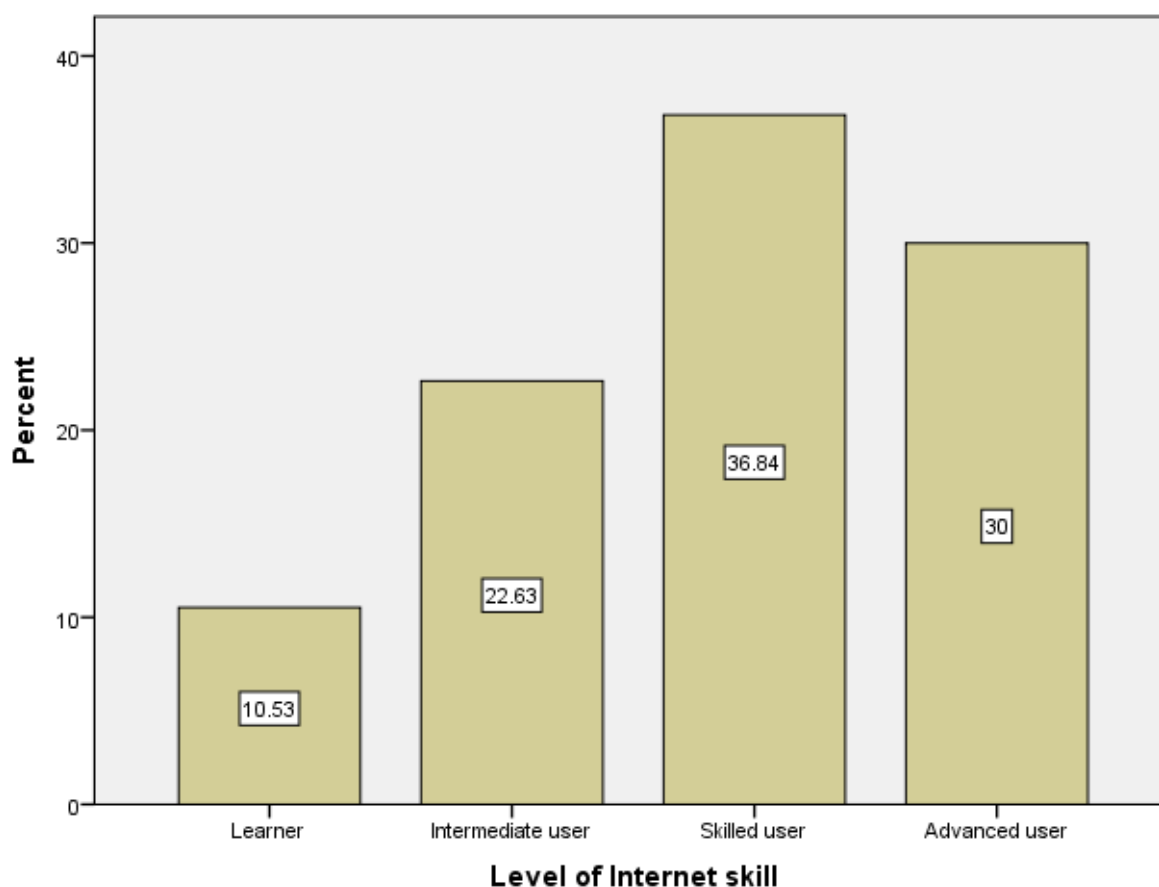
Figure 6.7 Percentage of participants against perceived level of Internet skill

Finally, attitude toward using social collaborative technologies refers to an individual's expression behaviour toward the use of social collaborative technologies. Psychologists regard attitude as expression of favour or disfavour toward an object. "Attitudes are hypothetical constructs that psychologists invented to explain phenomena of interest" (Schwarz, 2007). Eagly and Chaiken (1993) defined attitude as "a psychological tendency that is expressed by evaluating a particular entity with some degree of favour or disfavour".

This means that an expression one has towards an object is a product of evaluating that object, which can be over time or in an instant. An attitude is therefore formed by a person's past or present evaluations or experiences on that object. As claimed by Davis (1989), user attitudes are key in predicting and determining technology usage. Previous studies however show that these perceptions may change with time as users gain first-hand experience with technology usage, which, in turn, may change their subsequent technology usage behaviour (Bhattacherjee and Premkumar, 2004).

This section presents a summary of findings based on the participants' responses on the question about how they feel about the use of social networking tools for educational purpose. Using summative content analysis, the data from these responses were analysed and categorised into two sub-themes as shown in the figure. A summative content analysis involves counting and comparisons, usually of keywords or content, followed by the interpretation of the underlying context (Hsieh and Shannon, 2005). In this case, key expressions from the participants' responses about their view on the use of social collaborative technologies were counted and categorised into positive and negative.
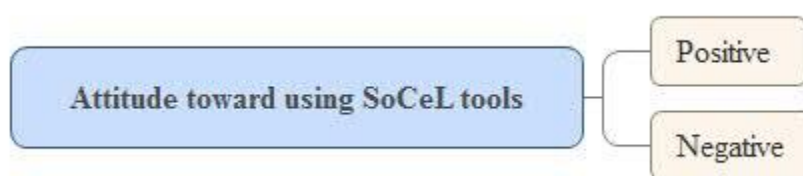
Figure 6.8 Attitude toward using social collaborative technologies

Table 6.2 lists the views which the participants expressed in the survey in demonstrating their positive and negative attitude toward using social collaborative technologies. Counting of the occurrence was done to establish which of the *expressions* were most common.

Table 6.2 Participants' expressions demonstrating attitude toward using social collaborative technologies (F is the number of occurrences)

Positive	F	Negative	F
Accessibility	9	Cheating	2
Collaboration	6	Cost and limitation	2
Connectivity	46	Distraction	1
Convenience	26	Inadequate skills	12
Diversity of learning styles	15	Incorrect and inappropriate contents	47
Exciting and trendy	8	Information overload	1
Exposure and improved skills	24	Encourages laziness in studying	34
Information sharing and interaction	18	Resistance to change	2
Self-expression	13	Security and privacy	62
Student engagement	6		

From Table 6.2, the most reinforcing factor for adoption is connectivity while the most discouraging factor is security and privacy. This therefor implies that a platform which supports reliable connectivity and less security or privacy risks is likely to be more effectively adopted for learning and teaching.

6.2.3 Actual use of social collaborative technologies

The actual use of social collaborative technology refers to what an individual user does with or how he or she utilises a particular technology tool in facilitating the learning processes. An earlier study by Otto et al. (2015) indicated that each of the social collaborative technologies was effective for a particular type of interaction. For instance, Facebook (because of its group chat feature) is mainly used for class announcements and other group activities. LinkedIn is used for professional connection and getting career information.

The factors that determine what and how an individual uses a particular social collaborative technology may affect one's satisfaction. Bailey and Pearson (1983) identified 39 factors affecting technology satisfaction and they argue that user satisfaction in a given situation is the sum of one's feelings or attitudes toward a variety of factors affecting that situation. This argument is in line with the work of Davis et al. (1989) in which they assert that the actual use and satisfaction of a particular technology is dependent of the attitude toward using it.

The actual use therefore reflects the sum of factors that is derived from user motivation and the external factors determining the use of that tool. This research used three variables, as depicted in Figure 6.9, to measure actual use of social collaborative technology.
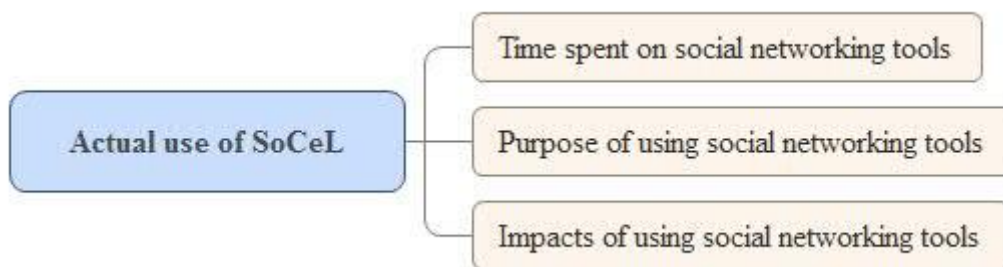
Figure 6.9 Actual use of social collaborative technology by participants

The use of online social networking tools has become commonplace within higher education because of the educational affordances offered by these tools, enabling students and lecturers to network, create, modify, aggregate, and access information (Otto et al., 2015). Facebook, for example, is used by students approximately thirty minutes in a day as part of their daily routine (Pempek et al., 2009) whilst they make contact with and create contents for others on the network.

Some studies (such as Tess, 2013; Paul et al., 2012; Junco, 2012b; Nadkarni and Hofmann, 2012) demonstrate that the amount of time spent using social networking tools has an impact on a student's academic performance. This therefore makes it important to study the effect of time spent on social networking tools especially in relation to the adoption of SoCeL. In this study, participants were asked to specify the average hours they spent on social networking per week and the results are summarised in

Table 6.3. These results show that on average, more than two and a half hours are spent on social networking per day which is consistent with a recent study by Mingle and Adams (2015) reporting that the majority of students spend more than two hours on social networks and this has negative impact on their academic grades.

As previously reported (Otto et al., 2015), students and lecturers are attracted to the use of these tools for a number of reasons which may be categorised in three perspectives, namely; pedagogical, social, and technological and their purpose of use may be grouped into five levels: networking, creating, modifying, aggregating, and lurking. The findings reported in that paper showed that whereas students and lectures use these tools for pedagogical and technological purposes, their usage was mostly for social purpose.

Table 6.3 Statistics on hours spent on social networking per week

N	Valid	544
	Missing	44
Mean		18.41
Median		9.00
Mode		2
Std. Deviation		27.103
Variance		734.567
Skewness		3.084
Std. Error of Skewness		0.105
Kurtosis		11.086
Std. Error of Kurtosis		0.209
Range		168

This study therefore sought to explore the purpose of usage by the students and the lecturers of the two selected universities in Uganda. The survey results presented in Table 6.4 shows that the five top activities performed by students and lecturers are: chatting, sharing information, making friends, learning, and seeking information.

Table 6.4 Purpose of using social networking tools

Activities on social networking tools	% Responses
Chatting	12.4%
Sharing information	12.2%
Making friends	11.4%
Learning	10.3%
Seeking information	10.1%
Getting news	9.5%
Entertainment	8.6%
Giving feedback	6.6%
Collaborating on group work	6.2%
Contacting and interacting with lecturer/student	4.6%
Brainstorming	4.1%
Checking other friends' profiles	4.1%

In order to establish the impact of the use of these social networking tools, participants were asked about what they thought was the greatest positive or negative impact of using

these tools. The results summarized in Figure 6.10 and Figure 6.11 show the number of responses given by students and lectures in terms of positive impact and negative impact of using social networking tools. Figure 6.10 summarises the issues which were highlighted by participants as positive impacts of using social networking tools. The top three issues mentioned by both lecturers and students were time learning support, information sharing, and accessibility. The five issues that were not mentioned by lecturers but students are updates, connection, research, motivation, and self expression. Refer to section 6.5.3 (page 167) for further discussions.
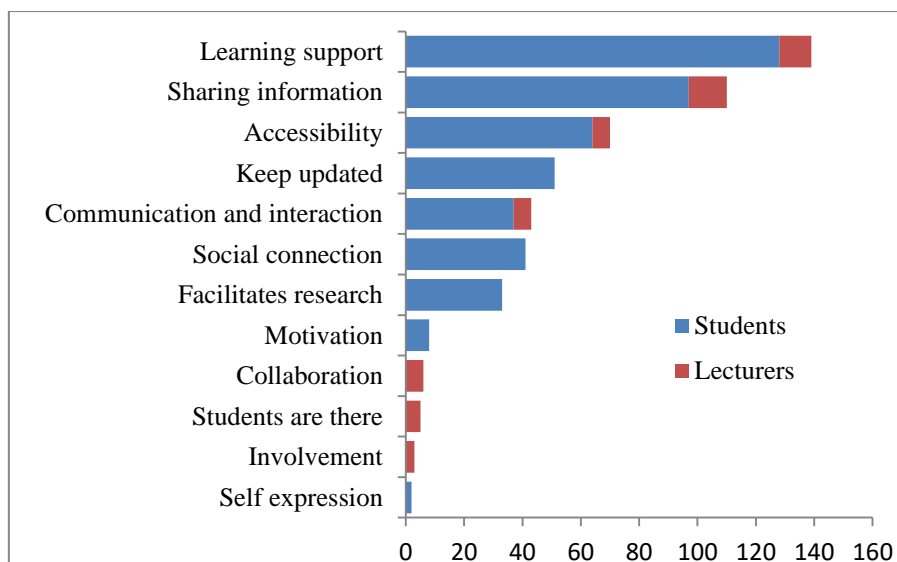
Figure 6.10 Positive impacts of using social networking tools
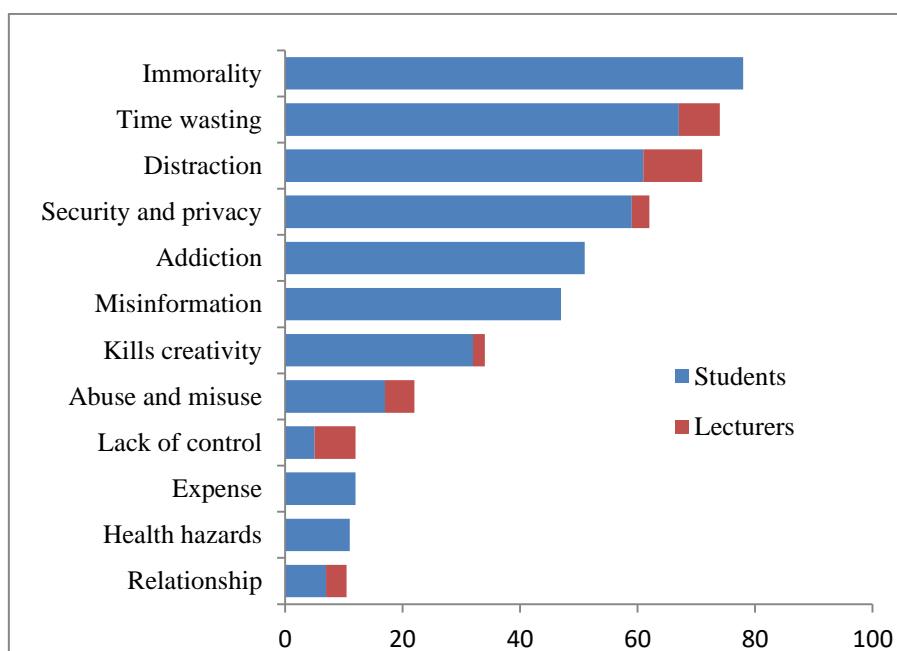
Figure 6.11 Negative impacts of using social networking tools

Figure 6.11 summarises the issues which were highlighted by participants as negative impacts of using social networking tools. The top three issues mentioned by both lecturers and students were time wasting, distraction, and security and privacy. The five issues that were of concern only to students but not to lecturers are immorality, addiction, misinformation, expense, and health hazards. Further discussion on this is in section 6.5.3 (page 167)

6.3 How external factors influence SoCeL adoption

As previously mentioned in section 2.7, external factors for SoCeL adoption, represented by $X_{1...n}$ in Figure 2.1 (on page 50), refer to the factors that determine the actual use (Park, 2009) of social collaborative technologies such as Facebook. They are not due to the user's own internal motivation but rather relate to individual differences, situational constraints, organizational characteristics and technology characteristics, having an impact on a user's behaviour (Saadé and Kira, 2007) towards using such tools, through mediated effects on perceived usefulness and perceived ease of use.

According to Talukder (2012), despite an institution's decision to use a particular learning technology, its actual usage depends on how users adopt it. Therefore, it is important to examine the usage of social collaborative technology by students and lecturers within the university because effective integration is only possible if there is general acceptance by users.

This study uses TAM as a basis of the theoretical framework. TAM as explained earlier (in section 6.1), is an information systems theory which postulates that technology use is a response that can be explained or predicted by user motivation, which, in turn, is influenced by some external factors including its feature and capabilities. The theory suggests that when users are presented with a new tool, a number of factors influence their decision about how and when they will use it.

The two particular beliefs postulated in this theory, perceived usefulness and perceived ease of use, explained in section 6.2.2, are of primary relevance for SoCeL adoption. TAM proposes that technology usage is determined by behavioural intentions, which are influenced by these two beliefs, which are in turn influenced by "external factors". Previous studies in this field indicate that several external factors are responsible for technology adoption within an organisation. These factors are categorised into four domains; social, demographic, individual, and infrastructure. In the following sections each of these factors are discussed.

6.3.1 Social factors

The adoption of use of social collaborative technology is driven by what Lin and Lu (2011) refers to as "social effect". An individual becomes more willing to use a particular social platform as more friends or peers join. This is partly because of the need for social support

(Lin and Bhattacherjee, 2009) which helps an individual to become more engaged and influential on the social network. It is easier to be more engaging and influential among those with whom an individual shares some social interest. Therefore, the number of other users of the same platform determines the motivation to adopt and use it. In the case of usage for educational purpose, the more the students and lecturers are on the network, the more the social effect.

Previous research shows that social factors are the most influencing factors in determining adoption of social networking tools. The findings from a study by Lin and Lu (2011) show that enjoyment is the most influential factor in people's continued use of social networking technology, followed by number of peers, and perceived usefulness. This was confirmed by the study conducted by Cheung et al. (2011) on "why students use Facebook" in which they conceptualized the use of social technology as intentional social action whilst they examined the relative impact of social influence, social presence. Later, Nadkarni and Hofmann (2012) proposed a model suggesting that the use of Facebook, for example, is motivated by two primary needs: (1) the need to belong and (2) the need for self-presentation.

This evidence from the literature indicates that social influence is a major factor in determining the adoption of social technology within educational environment after all, education is social in nature. Research in social influence, group membership legitimizes actions and the individual is guided by the group's rules of practice (Vannoy and Palvia, 2010). According to Vannoy and Palva (2010), society often exerts influence on technology use. Therefore, social influence determines technology adoption- the reason and the way it is used. This implies that technology used by others in an individual's social environment is likely to play an important role in adoption of that that technology (Talukder, 2012).

Social influence is the extent to which members of a social group influence one another's behaviour in adoption of technology (Talukder and Quazi, 2011). Vygotsky (1978) demonstrated that individual social behaviour and socialization are fostered by social interaction, consciousness and social cognition. Social behaviour and socialisation are important constructs supporting adoption of SoCeL.

In this study, current social practices among students and their lecturers were examined with the view of understanding how social factors influence their adoption of SoCeL. Vygotsky's social constructivist theory postulates that learning is an active and constructive process that requires interaction and collaboration (Panday, 2009).

There are a number of social activities that promote an individual's motivation to use social networking tools, which in turn support of learning. Participants were asked about social networking profiles, objectives of their social interaction, and social platform they use. Students and lecturers socialize and network via their Web browsers by joining social networking sites such as Facebook (Vannoy and Palvia, 2010) and creating personal social networking profiles to enable them interact with others on the social network. It is important therefore to understand how this socialisation determines the adoption of SoCeL. The following are findings on the social factors for SoCeL adoption by students and lecturers who took part in this study.

Online social networking profiles:

In order to fully explore SoCeL, the assumption drawn here is that when users embrace the culture of socialisation, they are not bound by the four walls of the classroom. Having online social networking profiles means that students and lecturers are able to socially interact online. In this study 545 students and 43 lecturers responded on whether or not they had online social networking profile.

The result summarized in Table 6.5, shows that the majority (94%) of the participants did have at least one online social networking profile but 6% did not. Using the *Chi* square "test of independence" with α = 0.05 as criterion for significance, data were analysed to determine whether there were statistically significant differences between different groups within the sample in relation to having online social networking profile.

Table 6.5 Participants with social networking profile

Response	f	%
Yes	554	94.2
No	34	5.8
Total	588	100

Tables 5.6, 5.9, and 5.10 in Chapter 5 give specific numbers of participants with social networking profile in terms of status, gender, and institution of affiliation. The results also showed that students were more likely to have an online social networking profile than lecturers although this difference did not prove any statistically significant relationship between the status and having online social networking profile. Based on these results

therefore it cannot be shown that we lecturers are less likely to use social collaborative technology than students.

$$(\chi^2(1, N = 588) = 1.055, p = 0.492)$$

Having online social networking profile is therefore completely independent of the status of students (f=554) or lecturer (f=34).

In terms of institution of affiliation, there was no statistically significant association with having online social networking profile:

$$(\chi^2(1, N = 588) = 1.05, p = 0.746)$$

It did not matter whether the participant was affiliated to Uganda Christian University (f=418) or Makerere University (f=170). Although the males were more likely to have an online social networking profile than their female counterparts, this difference among female (f=219), male (f=357), and those who preferred not to say their gender (f=12) were not statistically significant as per the Chi Square test:

$$(\chi^2(2, N = 588) = 2.029, p = 0.363)$$

This implies that there is no evidence to indicate that individual institutional environment had a significant cultural impact on the individual students. Instead, the wider national and international cultures could had determinant factors.

In terms of Age group, there was no significant difference ($\chi^2(6, N = 588) = 12.885, p = 0.141$) between 18-25 years ($f$=489), 26-30 years ($f$=48), 31-35 years ($f$=20), 36-40 years ($f$=11), 41-45 years ($f$=7), over 45 years ($f$=7), and those who preferred not to say their age group (f=6). There was no significant difference ($\chi^2(4, N = 588) = 1.806, p = 0.790$) in terms of academic levels Certificate (f=1), Diploma (f=34), Bachelor's Degree (f=508), Postgraduate Diploma or Master's Degree (f=38), and Doctorate Degree (f=2).

In general, having online social networking profile was not dependent on one's status, institution, age group, gender or level of qualification. Although some differences were established, they were not statistically significant.

Online social networking platforms:

The survey results in Figure 5.2, Chapter 5 showed that the five top online social networking platforms are Facebook, Google+, WhatsApp, Twitter, and Skype.

This result is consistent with previous studies (Pempek et al., 2009; Ryan and Xenos, 2011; Dey et al., 2012; Cheung et al., 2011) which reported that Facebook was the most popular tool used by students on one-to-one style, most often for social interaction (hung out), primarily with friends with whom the students had a pre-established relationship offline (Pempek et al., 2009). But they also use these platforms to interact with their lecturers as well as 'strangers'.

As already discussed in Chapter 5 (see Figure 5.5), the usage of online social networking platforms among students and lectures promote informal learning. There are a number of informal learning activities such as, chatting, searching and sharing of information, which can be integrated within the formal programme.

6.3.2 Demographic factors

In order to establish how the user motivation (in terms of perceived usefulness) for adoption of SoCeL is influenced by demographic factors and therefore, participants were asked about how perceived the usefulness of social collaborative technology. The results in Table 6.1 (page 141) show that 96.9% (N = 533) are positive about the usefulness of social collaborative technology. Only 1.1% of the participants consider it not useful and some 2% who did not know whether or not social collaborative technology is useful. For example, whether younger people are more motivated than the older or whether females are more motivated than males.

Looking at the different groups of participants, there were no statistically significant differences based on demographic factors in relation to the perceived usefulness of social collaborative technology. To explore the relationship between the demographic factors and the user motivation factor of "ease of use", this study used the *Chi* square test of independence with $\alpha = 0.05$ as criterion for significance. Ease of use of social technology was measured using self-reported Internet skill measured in ordinal scale 1(learner) to 4 (advanced user).

The results show that there are statistically significant relationships between internet skills and the demographic factors (status, institution of affiliation, age, gender, and level of qualification) as explained below:

Status:

Table 6.6 Status vs. of level of Internet skill

Status	Level of Internet skill				
	Learner (%)	Intermediate user (%)	Skilled user (%)	Advanced user (%)	Total
Lecturer	0 (0)	1 (2.5)	14 (34.1)	26 (63.4)	41 (100)
Student	60 (11.3)	128 (24.2)	196 (37.1)	145 (27.4)	529 (100)
Total	60 (10.5)	129 (22.6)	210 (36.8)	171 (30.0)	570 (100)

Chi-Square = 29. 139 **

**P–value < 0. 001

Using the Chi square test ($\chi^2(3, N = 570) = 29.14, p < 0.05$), students were more likely to describe themselves as 'learner' (11%) compared to none of their lecturers. On the other hand, 64% of the lecturers described themselves as 'advanced users' compared to 27% of the students. This association is statistically significant, implying that the more someone is exposed to technology, the more likely they will be 'advanced users' and this is about self-confidence on the use

Institution of affiliation:

The result from the Chi square test below indicates a significant relationship between institution of affiliation and the Internet skills and this can be attributed to self-determination.

Table 6.7 Institution of affiliation vs. level of Internet skill

Institution	Level of Internet skill				
	Learner (%)	Intermediate user (%)	Skilled user (%)	Advanced user (%)	Total
Uganda Christian University	48 (11.9)	98 (24.3)	158 (39.1)	100 (24.8)	404 (100)
Makerere University	60 (7.2)	12 (18.7)	52 (31.3)	71 (42.8)	166 (100)
Total	60 (10.5)	210 (22.6)	210 (36.8)	171 (30.0)	570 (100)

Chi-Square = 18.707 **

**P–value < 0. 001

$$(\chi^2(3, N = 570) = 18.71, p < 0.05)$$

There were 12% of participants from Uganda Christian University who described themselves as learners compared to 7% from Makerere University. The result also shows that only 25% of the participants from Uganda Christian University indicated that they are advanced users compared 43% from Makerere University.

Age:

Table 6.8 Age group vs. level of Internet skill

Age group	Level of Internet skill				Total
	Learner (%)	Intermediate user (%)	Skilled user (%)	Advanced user (%)	
18-25	54 (11.3)	120 (25.2)	158 (37.4)	124 (26.1)	476 (100)
26-30	4 (8.7)	4 (8.7)	18 (39.1)	20 (43.5)	46 (100)
31-35	0(0)	2 (10.5)	4 (21.1)	13 (68.4)	19 (100)
36-40	2(18.2)	0(0)	12(8.12)	7 (63.6)	11 (100)
41-45	0(0)	0(0)	3 (50.0)	3 (50.0)	6 (100)
Over 45	0(0)	1 (14.2)	4 (57.2)	2 (28.6)	7 (100)
Prefer not to say	0(0)	2 (40.0)	1 (20.0)	2 (40.0)	5 (100)
Total	60 (10.5)	129 (22.6)	210 (36.8)	171 (30.0)	570 (100)

Chi-Square = 45.392 **

**P–value < 0. 001

In terms of age, there were more than a half of participants between the age of 31 and 45 years who described themselves as advanced user compared to less than a half of those of age under and over 45 years. All the participants within the age bracket of 35 to 45 years considered themselves skilled or advanced user. Most importantly, this association was statistically significant using the *Chi* square test with α =0.05 as critical level for significance

$$(\chi^2(18, N = 570) = 45.40, p < 0.05)$$

Gender:

Table 6.9 Gender vs. level of Internet skill

| Gender | Level of Internet skill | | | | |
	Learner (%)	Intermediate user (%)	Skilled user (%)	Advanced user (%)	Total
Female	35 (16.6)	58 (27.5)	81 (38.4)	37 (17.5)	211 (100)
Male	24 (6.9)	69(19.8)	123 (35.3)	132 (37.9)	348 (100)
Prefer not to say	1 (9.1)	2 (18.2)	6 (54.5)	2 (18.2)	11 (100)
Total	60 (10.5)	210 (22.6)	210 (36.8)	171 (30.0)	570 (100)

Chi-Square = 36.019 **
**P–value < 0. 001

A significant dependence was also observed between gender and level of Internet skills from the results of the *Chi* square test shown below with α =0.05 as critical level for significance:

$$(\chi^2(6, N = 570) = 36.02, p < 0.05)$$

This result shows that whereas 38% of the males considered their Internet skills as advanced, only 18% of the female did. Further, 7% of males compared to 17% of the females described their skills as learner. This could point to the wider culture in which females are disadvantaged and deprived equal opportunity to explore technology. For instance, culturally, in Uganda it is the duty of the female to do most of the house chores while their male counterpart could have more time available for them to spend on exploring technologies and therefore their self-determination is boosted.

Qualification:

Another demographic factor that influence the level of skill of participants is the level of qualification. It appeared from the result of the *Chi* square test, shown below with α =0.05 as critical level for significance, that none of the participants at the post graduate level considered themselves a learner while 11% of those at bachelor's level and 9% at the diploma level considered themselves learners.

Table 6.10 Qualification vs. level of Internet skill

Level of qualification	Level of Internet skill				
	Learner (%)	Intermediate user (%)	Skilled user (%)	Advanced user (%)	Total
Undergraduate	59 (9)	125 (11.1)	199 (23.7)	145 (27.3)	531 (100)
Postgraduate	1 (0)	3 (2.6)	11 (7.7)	24 (28.2)	39 (100)
Total	60 (10.5)	129 (22.6)	210 (36.8)	171 (29.6)	570 (100)

Chi-Square = 34.108 **

**P–value = 0. 001

$$(\chi^2(12, N = 570) = 34.11, p < 0.05)$$

More than two thirds of participants at the post graduate levels indicated they were advanced users compared to 28% and 27% of those at bachelor and diploma levels respectively.

6.3.3 Individual factors

Individual effect being one of the determinants of adopting SoCeL is discussed here in terms of three factors namely; individual's experience on the Internet, time spent using social networking tool, and ownership of ICT device by an individual.

Experience on the Internet:

Participants were also asked about their experience on Internet usage in terms of number of years spent using Internet. Statistical tests were conducted to establish how having experience on Internet usage affects the user's motivation to use social technology especially in influencing the perceived usefulness and perceived ease of use of social technology.

Table 6.11 summarizes the result of a survey in which 538 participants responded to the question regarding their Internet experience. There were 219 females, 357 males and 12 participants who preferred not to specify their gender. The range of years of experience was 0-20 with mean years of experience of 5.93 and the standard deviation of 3.645. Since the distribution of years of experience was not perfectly normal, and the dependant variables were measured in ordinal scale, Spearman's rho (ρ) was used to conduct the correlation test. A perfectly (symmetrical bell-shaped) normal distribution of the observed data means that the values of the mean, the mode and the median are all the same. In this case, the mean is 5.93 compared to the median and the mode which have the value 5.0 (Table 6.11), therefore,

according to Bryman (2008), Spearman's correlation is preferred for the test on this kind of data because the Spearman's correlation is monotonic but not linear (Bryman, 2008).

Table 6.11 Statistics on experience on using Internet

N	Valid	538
	Missing	50
Mean		5.930
Std. Error of Mean		0.157
Median		5.000
Mode		5.000
Std. Deviation		3.645
Skewness		1.002
Std. Error of Skewness		0.105

Participants were surveyed about their experience (number of years) of using Internet (n=538, M=5.93, SD= 3.65), perceived usefulness (scale of 0-3) of social collaborative technology, and perceived ease of use (scale of 1-4) of social collaborative technology. A Spearman's rho (ρ) data analysis revealed a moderate positive correlation, $\rho= 0.49$ between the number of years of using Internet and perceived ease of use of social collaborative technology. Participants who had more years of experience in using Internet reported higher levels of skill in using social collaborative technology. This correlation was significant at the 0.01 level (2-tailed).

However, there was weak negative correlation, $\rho= -0.06$ between participants' number of years of using Internet and perceived usefulness of social collaborative technology. Participants who had more years of experience in using Internet report lower level of usefulness of social collaborative technology.

Time spent online:

Participants were also surveyed about the time (hours per week) they spent on social networking (n=544, M=18.41, SD= 27.10). In order to determine how this affects their perceived usefulness (scale of 0-3) of social collaborative technology and perceived ease of use (scale of 1-4) of social collaborative technology, a Spearman's rho (ρ) data analysis was conducted.

The results revealed a weak positive correlation, $\rho= 0.16$ between the number of hours spent on social networking per week and perceived ease of use of social collaborative technology. Participants who spent more hours on social networking per week reported

higher levels of skill in using social collaborative technologies. This correlation was significant at the 0.01 level (2-tailed).

There was also a weak positive correlation, $\rho = 0.13$ between the number of hours spent on social networking per week and perceived usefulness of social collaborative technology. Participants who spent more hours spent on social networking per week reported higher levels perceived usefulness of social collaborative technology. This correlation was also significant at the 0.01 level (2-tailed).

Ownership of ICT device:

To explore the effect of owning an ICT device on the user motivation to adopt SoCeL, participants were asked about their ownership of desktop, laptop, tablet, or mobile phone. The main interest was to determine whether or not having any one of these would increase the chances of adopting SoCeL. If there were such and effect, the second interest was to determine which of these devices would likely to have the most impact on adoption of SoCeL.

The result from the *Chi* square test below, with α =0.05 as critical level for significance, shows that there was no difference in the level of perceived usefulness of social collaborative technology for participants who owned and those who didn't own the device:

$$(\chi^2(3, N = 545) = 0.25, p > 0.05)$$

This meant that ownership of the device did not have an effect of the perceived usefulness. There was also no effect owning a device had on the perceived ease of use of social collaborative technology based on the result of *Chi* square test with α =0.05 as critical level for significance:

$$(\chi^2(3, N = 545) = 6.01, p > 0.05),$$

There was therefore no statistically significant evidence of effect of ownership of such ICT device on the user's motivation to adopt SoCeL and no need to determine which device would have the most effect on adoption of SoCeL.

6.3.4 Infrastructure factors

The objectives of this particular aspect of analysis were to establish whether or not the daily access increased the chance to adopt SoCeL and to determine which means was most effective.

Frequency of Internet access:

Although there were differences in the sense that 63% of participants who accessed the Internet daily reported that they perceived social collaborative technology as being very useful compared to 55% of participants who didn't accessed Internet every day and reported that they perceived social collaborative technology as being Very useful. Meanwhile, only 1% of those who had daily Internet access reported that they perceived social collaborative technology as not useful compared to 2% of those who didn't have daily Internet access. This suggests that with familiarity, one can see more uses and get more motivated. This was based on the Chi square test with α =0.05 as critical level for significance below:

$$(\chi^2(3, N = 545) = 3.29, p > 0.05)$$

These differences were not statistically significant and therefore showed that daily Internet access did not influence perceived usefulness of social collaborative technology.

However, the *Chi* square test of independence with α =0.05 as critical level for significance, showed statistically significant differences in the levels of perceived ease of use of social collaborative technology between participants who accessed Internet daily and those who didn't.

$$(\chi^2(3, N = 545) = 64.31, p < 0.05)$$

 38% of participants who accessed Internet daily reported highest level of perceived ease of use compared to only 17% of those who didn't have daily Internet access. While only 4% of those who accessed internet daily described themselves as learners, 21% of those who didn't accessed Internet daily described themselves as learners. This result means that daily access to Internet increased the levels of perceived ease of use of social collaborative technology.

Means of Internet access:

As illustrated in Figure 6.12 and   Figure 6.13, the survey results showed that although 79% of the respondents owned mobile phones compared to other ICT devices. Only 62% used their mobile devices to access Internet compared to 77% who accessed Internet through campus computer laboratories. These results mean that participants relied more on the Internet access provided by the university.

To understand whether the means of Internet access had an impact on the perceived usefulness and perceived ease of use of social collaborative technology, the *Chi* square tests were conducted but results revealed that there were no significant relationships between Internet access means and perceived usefulness. However, there were significant relationships between Internet access means and perceived ease of use.

Using the *Chi* square tests, the results showed there were positive effects of accessing the Internet through the office computer, home computer, and mobile devices on the perceived ease of use of social collaborative technologies. This meant that participants who accessed Internet through these means had greater chances of having higher levels of skills to adopt SoCeL.
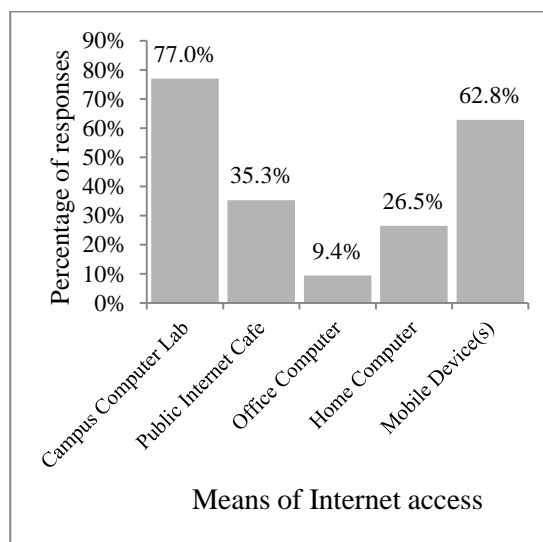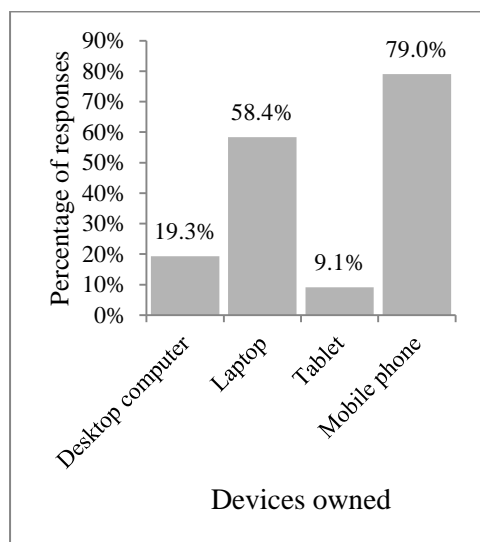
Figure 6.12 Responses on ICT devices owned   Figure 6.13 Responses on means of Internet access

6.4 User motivation influence on SoCeL adoption

The objective of this section is to provide analysis based on the relationships between user motivation and the external factors for adoption of SoCeL, which indirectly influence the actual use of social collaborative technologies. An individual's behavioural intention to use a particular technology is caused by both external and internal factors.

There exists a connection between perception (perceived usefulness and perceived ease of use), intention (attitude toward using), and action (actual use). Perception leads to attitude which affects behaviour which creates action that are performed in defining life. It was

shown in a study by Hong et al. (2003) that attitude toward using technology results from perceived usefulness and perceived ease of use. Motivation therefore causes a person to show behavioural intention to perform an action either for the purpose of achieving a goal (extrinsic) or for the sake of enjoyment (intrinsic).

6.4.1 Perceived usefulness

Perceived usefulness was postulated by Davis to be a fundamental determinant of user acceptance of technology. It can also be used to examine ratings of different user groups for the same technology (Adams et al., 1992). With this background, we can explore the trend of adoption of social collaborative technology for a better understanding of its effective integration in higher education. If for instance, the measures show deficiencies in SoCeL adoption, further study may be taken to understand factors that are likely to influence its success.

As argued by Adams et al. (1992) understanding the diffusion of a technology helps in understanding the determinants of its adoption. It is clear from the previous studies that perceived usefulness of a technology influences its adoption. Users within an educational environment care about what the technology will help them to achieve, especially being connected to those they have to interact with and to support their educational activities. This is consistent with the findings in this study which indicate that 64% of the participants who perceived social collaborative technology as useful reported that they were using it to support learning or teaching.

One of the objectives in this study was to determine the extent to which perceived usefulness influences adoption of the use of social collaborative technology by university students and lecturers. This was determined by the analysing the relationship between perceived usefulness and attitudes toward using social collaborative technology. Using the *Chi* square test with α =0.05 as critical level for significance, the results showed statistically significant effect of perceived usefulness on the attitude toward using social collaborative technology:

$$(\chi^2(6, N = 548) = 17.93, p < 0.05)$$

The study found that 17% of those who perceived social collaborative technology as not useful reported to have negative attitude toward using it, compared to 3% of those who perceived it as very useful and reported to have negative attitude toward using it. Whereas

89% of participants who perceived social collaborative technology as very useful reported to have positive attitude toward using it compared to 50% of those who perceived it as not being useful and reported to have negative attitude toward using it.

6.4.2 Perceived ease of use

Perceived ease of use plays a critical role in predicting and determining a user's decision to adopt a particular technology (Hackbarth et al., 2003), making it another significant construct in user motivation for technology adoption. As Davis (1989) pointed out, even though a user finds a technology useful, he or she may believe that the technology is too hard to use or its performance benefit (usefulness) is outweighed by the efforts required to use it.

Perceived ease of use was defined by Davis as the extent to which a person believes that using the technology would require no "great effort" or was not considered to be "difficult". Users generally perceive a technology is easier to use as they gain more knowledge and confidence through direct experience in using it (Hackbarth et al., 2003). Perceived ease of use of technology may result from the skill set possessed by an individual and it bears influence on the attitude towards using it. In a recent study by Mukoko (2013), perceived difficulty was reported among other psycho sociological factors playing an important role in the adoption and use of the computer and the Internet in Cameroon. Davis (1989) claims that a technology perceived to be easier to use then it is more likely to be accepted by users. This claim is what this study sought to establish for social collaborative technology adoption by the university students and lecturers. In other words, one of the objectives of this study was to understand how perceived ease of use influenced attitude toward using social collaborative technology.

One of the advantages of studying perceived ease of use of a technology is that it "allows the designer to direct limited resources to producing more effective training interventions that foster desirable user perceptions of it by augmenting positive feelings toward the technology or by reducing negative feelings against it"(Hackbarth et al., 2003).

Using the *Chi* square test with α =0.05 as critical level for significance, the results showed statistically significant effect of perceived ease of use on the attitude toward using social collaborative technology:

$$(\chi^2(6, N = 568) = 12.79, p < 0.05)$$

The study found that 8% of those who described their skill level to use social collaborative technology as *learner* reported to have negative attitude toward using it compared to 2% of those who described their skill level to use social collaborative technology as *advanced* and reported to have negative attitude toward using it. Whereas 89% of participants who described their skill level to use social collaborative technology as *advanced* reported to have positive attitude toward using it compared to 85% of those who described their skill level to use social collaborative technology as *learner* and reported to have negative attitude toward using it.

6.4.3 Attitude toward using technology

Davis (1989) showed that attitude toward using technology mediates the effect of perceived usefulness and perceived ease of use on the actual use of technology although he pointed out that attitudes do not fully mediate the effect of perceived usefulness and perceived ease of use on behaviour. What is significant from previous studies on attitudes on adoption of technology is that external factors or determinants due to the technology, users, and environment directly or indirectly influence the formation of a user's attitude towards technology adoption.

One of the objectives of this study was to determine the extent to which adoption of social collaborative technology is determined by attitudes towards its usage. However, as already explained earlier, attitude is difficult to measure as it is a hypothetical construct that cannot be observed directly. Most researchers therefore rely on behaviour and self-reports of attitudes but these are highly context-dependent and can be profoundly influenced by minor changes in question wording, question format or question order but it can be evaluated on the basis of its explanatory power (Schwarz and Bohner, 2001).

This study explored the positive and negative attitudes of the users on SoCeL through two groups of questions asking them to explain their experiences and the impacts of using this technology. The results are explained below as positive attitudes and negative attitudes:

6.4.3.1 Positive attitudes toward SoCeL

Positive attitude toward SoCeL refers to a positive reaction toward adopting it. Previous studies (such as Hong et al., 2003; Nair and Das, 2012) indicate that when users are exposed to technology, they develop positive attitude toward using it.

In a study conducted by Hong et al. (2003) at a Malaysian university on students' attitudes toward the use of the Internet for learning, demonstrated that when students are

provided with computer facilities to support their learning, and the lecturers encouraged to actively use information technology in the teaching and learning processes, students develop positive attitudes toward using the that technology as a learning tool.

It can be argued that adequate basic knowledge of the technology (perceived ease of use) and view that it provides supportive learning environment (perceived usefulness) creates positive attitude towards using that technology for learning purpose. The study by Hong et al. (2003) showed that students with better basic Internet skills, and who viewed the learning environment as promoting the use of the Internet, favoured using the Internet for learning.

This section is intended to explore the positive attitudes the participants demonstrated toward adoption of SoCeL and to highlight the extent to which perception contributed to this positive attitudes using qualitative analysis of data. During the survey, participants who demonstrated positive attitudes toward using social collaborative technology expressed the following views: accessibility, collaboration, connectivity, diversity of learning styles, exciting and trendy, exposure and improved skills, feedback, information sharing and interaction, research, self-expression, and student engagement.

6.4.3.2 Negative attitudes toward SoCeL

Negative attitude toward SoCeL refers to a negative emotional reaction toward adopting it. It is known from previous studies that negative attitudes towards using technology discourage adoption of technology. People with negative attitudes towards using technology, in most cases, are less skilled in computer use and are therefore less likely to accept and adapt to technology than those with positive attitudes.

For example, a study by Al-Zaidiyeen et al. (2010) found that lecturers who hold negative attitudes towards the use of technology are less likely to contribute effectively to the utilization of technology for educational purposes. This implies that when lecturers don't value the benefits of technology, their attitudes toward the use of it tend to be more genitive (Mwalongo, 2012; Player-Koro, 2012).

Using qualitative analysis of data, this section is intended explore the negative attitudes the participants demonstrated toward adoption of SoCeL and to highlight the extent to which their perception contributed to these negative attitudes. Participants who demonstrated negative attitudes toward using social collaborative technology expressed the following views; cheating, cost and limitation, distraction, inadequate skills, incorrect and in inappropriate contents, information overload, laziness in studying, resistance to change, and security and privacy.

6.5 Actual use of social collaborative technologies

In their article, Legris et al. (2003) argue that technology implementation is costly and has a relatively low success rate. This may be attributed to the factors that were identified by Davis (1986) as he tried to make sense of the effect of external variables and the user motivation to the actual use of a technology.

These factors determine whether or not an individual adopts technology. However, whether the actual use of technology results in user satisfaction is another thing. Previous studies highlight several factors responsible for technology satisfaction. Bailey and Pearson (1983) identified 39 factors affecting technology satisfaction. For practicality, Davis (1986) grouped these factors responsible for technology adoption into a model –TAM in a way that would facilitate analysis of technology use. However analysis of empirical research using TAM shows that results are not totally consistent or clear which suggests that significant factors are not included in the models (Legris et al., 2003).

This study explored how university students and lectures were actually using social collaborative technology in support of their educational activities whilst examining the effect this may have on students' learning. The two factors considered here to explore the actual use of social collaborative technology are time and the perceived effect as explained below.

6.5.1 Time spent on social networking

A statistically significant negative relationship between time spent by students on social networking and their academic performance was reported by (Tess, 2013; Paul et al., 2012). Similarly, Junco (2012b) reported that time spent on Facebook was strongly and significantly negatively related to overall GPA, while only weakly related to time spent preparing for class. This finding means that too much time spent on social networking is likely to affect an individual student's performance. This was also confirmed by Nadkarni and Hofmann (2012) who reported that high usage of social networking tools relates to lower mean GPA and fewer hours per week of studying.

This study showed in 6.3.3 that participants spent on average two and a half hours using social networking tools per day. This duration of time spent on social networking tools is could have negative impact on academic performance as reported in study by Mingle and Adams (2015), which revealed that spending more than two hours on social networks impacts negatively on the students' academic performance. According to Mingle and Adams, the majority of students experienced negative effects such as poor grammar and spelling, late

submission of assignment, less study time and poor academic performance due to the heavy participation on social media networks. Thus the users should be guided on how to effectively manage time whilst using these tools for example, by having self-regulated learning style whereby they are trained to independently and proactively engage in self-motivating and behavioural processes that increase goal attainment and avoid disruptions (Dabbagh and Kitsantas, 2012).

6.5.2 Purpose of using social networking tools

As already discussed in section 5.3.3.3, there are various informal learning activities that users perform when on social networking platform. Users are motivated to use these tools because of (1) the need to belong and (2) the need for self-presentation (Nadkarni and Hofmann, 2012). In a university environment, to fulfil these needs, users perform the following activities (Table 6.4) on the social networking tools; making friends, chatting, sharing information, learning, collaborating on group work, giving feedback, seeking information, brainstorming, checking other friends' profiles, entertainment, getting news, and interacting with lecturer/student. These user activities help in engagement and useful interaction in a learning environment.

For instance, Nadkarni and Hofmann's (2012) review of 42 evidence-based studies on factors contributing to Facebook use revealed that users engage in sharing of social information such as demographics and personality characteristics. These include name, gender, birth date, e-mail address, home town, contact information, personal interests, job information and a descriptive photograph. This information helps in building trust and leads to sharing of further information that promotes learning. Users also share information that helps them in their work.

6.5.3 The impact of using social networking tools

It is important to note that the use of social networking tools can have impact (both positive and negative effects) on the individual student and lecturer since they spend enormous amount of time social networking. Although several studies indicate that higher level of usage of these tools affect individual users especially for the young people, fewer studies seem to focus on establishing the magnitude of this impact what types of individual users are affected most.

However, a study by Wilson et al. (2010) indicate that young adults' use of social networking tools and addictive tendency toward the use of these tools can affect their personality characteristics and levels of self-esteem. The findings from this study indicated higher levels of both social networking tools use and addictive tendencies especially among extroverted and unconscientious individuals. What this means is that heavy usage of these tools may have profound impact on students' learning. In order to explore the impact of social networking tools usage on the student's learning, participants were asked in a survey (n=588) to give their views on the positive and negative effects they have expeirenced.

Bass III (2016) also found out, teenagers admit to have: shared information they would not share in other places, shared information using a false identity, shared something they regretted later and pretended to be someone else, which might affect their social status and self-esteem. However, in this study, the general feeling of immoral activities and behaviour online was deemed to be the most significant pitfall. Examples of this include sharing of pornographic materials and use of languages that are considered inappropriate given that Uganda is largely a Christian nation where immorality is an issue especially at the Uganda Christian University, where immorality is strongly denounced. Time wasting and distraction were among the responses that participants, particularly students, gave. Accordingly, they feel that a lot of time is unnecessarily spent on social collaborative technologies and as a result they get distracted from the important activities such as learning. An effective mechanism to enhance individual self-control would be helpful in this case.

6.6 Chapter summary

While SoCeL can be an important approach in teaching and learning in higher education, understanding how this approach can be best integrated and managed within the higher education system is very important. This chapter explored the adoption of SoCeL in higher education using the data obtained from two universities in Uganda with focus on the foundational technology adoption theory (TAM), determinants of SoCeL adoption, and the actual use of social collaborative technology by students and lecturers. This provided basis for designing a model for effective integration and management of SoCeL in higher education which is presented in chapter 7.

TAM is a fundamental theory to explain how technology is adopted and used. This study based on TAM to explore the adoption of SoCeL in higher education in terms of the determinants (external factors), user motivation, and the actual use of social collaborative technology by university students and lecturers. Relationships between various factors were

also explored to determine how they influenced the adoption and use of social collaborative technology.

With reference to related studies in this field this chapter presented and discussed several external determinants responsible for technology adoption within higher education context. These determinants were categorised into four domains; social, demographic, individual, and intuitional factors.

Motivation theory, which has been widely used to explain individual's adoption of technology, was used in this study to explain the individual user's motivation to adopt and use SoCeL. Previous studies showed that an individual's motivation to use a particular technology is demonstrated by the attitude towards using it which is determined by two cognitive constructs enshrined in TAM as perceived usefulness and perceived ease of use. These two contracts were presented and their relationship with the attitude toward using social collaborative technology was discussed as well.

Finally, the actual use of social collaborative technology by university students and lecturers, in terms of time spent, purpose of using, and the impact of using social networking tool, was presented. The results discussed in this chapter showed that participants spent on average more than 2 and half hours on social networking per day, which is a significant amount of time. Another finding that was presented was that chatting, sharing information, making friends, learning, and seeking information were top activities participants involved in whilst using social networking tools. Whereas there are many factors that affect the actual use of SoCeL, some are significant to both students and lecturers while others are specific to a group.

The next chapter extends the analysis of the results presented in chapter 5 and 6 in order to present a model for integration and management of SoCeL in higher education

Chapter 7

Integrating Social Collaborative e-Learning

7.1 Introduction

This chapter presents the frameworks for integrating social collaborative e-learning (SoCeL) in higher education based on the findings discussed in the previous chapters. However, before presenting these frameworks, a discussion summarising the three aspects of the SoCeL model is presented in the subsequent sections (7.2, 7.3, and 7.4). This discussion relates to the implication and recommendation following the findings presented in Chapters 5, and 6 regarding SoCeL environment and its adoption by students and lecturers. These two frameworks (SoCeL blended environments - 7.5.2 and the framework for SoCeL adoption - 7.5.3), were arrived at through a modelling process. They provide a basis for designing a blended environment and an effective adoption strategy for SoCeL in higher education.

The conceptual framework (in Chapter 3) was used to set out the lines of inquiry for this doctoral study and venues for further research (see Chapter 8), potentially moving SoCeL towards becoming a credible e-learning theory in the 21st century. The conceptual framework was used to obtain data and to aid in establishing the specific requirements for modelling SoCeL integration within the context of higher education in a developing country. In 7.2, the justification of the SoCeL model is highlighted based on the blended approach on which SoCeL was conceptualized.

Modelling is an important aspect of the *requirements engineering* process, which involves eliciting individual stakeholder expectations and needs before developing them into detailed, requirements, documented and specified in such a way that they can serve as the basis for further research and development activities (Pohl, 2010). Requirements engineering (see 4.3.1) was used as a key approach to conduct this study and what is presented here (in 7.2, 7.3, and 7.4) are the output of that process, which resulted from further the analysis of the data presented in Chapter 5 and Chapter 6.

7.2 What makes the SoCeL model an important learning approach

The goal of the SoCeL model is to provide guidance on the use of social collaborative technologies in higher education. It describes how students can effectively use these tools to access, create, modify, aggregate information, and share with others, including their lecturers, and the external world, during the learning process. The concept of SoCeL is in line with the goal of e-leaning in the 21st century of eliminating time and space constraints in the educational provision (Garrison, 2011) whilst utilising the features of the interactive Web to enhance interaction and collaboration (Du et al., 2012). This thesis argues that e-learning systems should adopt a flexible and blended environment to suit a particular learning need or subject.

What makes SoCeL an important model learning in the 21st century is the fact that the SoCeL concept was coined as an integrated learning concept, reflecting a blended e-learning environment in terms of method, mode, and activities of learning and it is also supported by existing learning paradigms such as constructivism (Raskin, 2002; Duit and Treagust, 1998) and connectivism (Kop and Hill, 2008; Siemens, 2005). This is aimed at making e-learning more motivating and engaging. Some of the traditional e-learning systems are not motivating and instead frustrate, confuse, and do not interest student and therefore affect their learning negatively (Zhang et al., 2004). It is hoped that SoCeL can encourage an integrated environment to support interactive and collaborative learning.

SoCel model of learning emphasises the following aspects of learning which are generally agreed to be essential for blended e-learning: managing informal e-learning, establishing educational affordances of SoCeL, and managing educational collaborations. In order to have these aspects addressed and to support effective integration of SoCeL, the two frameworks were developed. These frameworks extend the conceptual framework presented in Figure 3.1 whilst addressing the gaps identified in Chapter 2 and emphasising the importance of an integrated (blended) learning approach.

7.3 How to provide effective SoCeL environment

Generally learning environments are any physical or virtual conditions which allow learning materials to be delivered to the students and enable interaction between students and lecturers. From this definition two elements are worth noting as significant in building an effective environment for SoCeL integration. These elements are: learning materials and learning context. The argument based on data presented in Chapter 5, is that SoCeL can be

effective in a blended environment. This section focuses on highlighting the factors supporting this argument in terms of the two elements used to define the learning environment: learning materials and learning contexts. The following sections present this argument in further detail.

7.3.1 Learning materials

Learning materials (physical or electronic) are resources that support the learning process. Electronic learning (e-learning) materials are electronic resources that can be used to support students' learning process and are delivered electronically to remote students via a computer network (Zhang et al., 2004). These include text, multimedia, and software that students can use independently and remotely or as part of an in-class lesson. Lecturers can also use them to supplement or replace the traditional textbook. This means that e-learning materials can be delivered either in a blended environment or as a purely online environment.

From the data presented in Section 5.3, Chapter 5, 41% of the participants who took part in the online survey conducted in two universities in Uganda, preferred a blended environment. Meanwhile, 26% preferred a purely online environment and 32% preferred a purely face-to-face environment. This implies that the majority of the respondents accepted electronic delivery of learning materials (either as blended or online delivery). These findings match those of Gaebel et al. (2014), which indicate that in Europe, most institutions of higher learning use e-learning mainly in a blended form (partly online and partly face-to-face), but also in a purely online form (the entire course is offered online).

It should be noted that students' background and characteristics as well as the levels of computer competence among staff and students may be responsible for the effectiveness of learning in a blended environment in Uganda. Recent studies by (Kintu and Zhu, 2016; Justice and Zhu, 2015) indicate competence and confidence of the students and staff are key determinants for the successful implementation of a blended learning environment in Uganda. In the same way, self-regulation, attitudes towards blended learning, family support and management of workload do influence the level of success of a blended learning approach.

Considering the reasons cited by participants for preference of a blended e-learning approach (see Table 5.12), this thesis proposes the SoCeL model based on 'switched' approach which allows delivery to be switched from online to face-to-face depending on the nature of the course and the interest of the students as discussed in 7.5. Consequently, SoCeL can leverage the benefits of both online and face-to-face environments in a more flexible

way. One of the respondents indicated that the choice of environment should depend on the nature of the subject. For instance, as mentioned by one of the students that some courses like math and accounts require hands on learning so it would be difficult to learn via online and that they can be supervised more effectively in a face-to-face session. This means that some students perceive some courses to be more fit to be delivered online and others face-to-face.

7.3.2 Learning context

Learning context refers to an environment or a situation that can impact the learning process. In this thesis, learning context is used to understand how the learning material is delivered or what is learned. Three contexts have been used in this thesis to explore the SoCeL environment, these are social, technological, and pedagogical contexts. From 7.3.2.1 to 7.3.2.3 the implication of these contexts for a SoCeL model are highlighted.

7.3.2.1 Social context

Casper (2001) defines human social environments as encompassing the immediate physical surroundings, social relationships, and cultural milieus within which defined groups of people function and interact. This definition helps us to understand social context of a learning environment. In this thesis, social context of a learning environment (also referred to as social environment or sociocultural context) means the immediate physical and social setting in which SoCeL happens. It includes the culture and institutions that influences the way students and lecturers interact and collaborate during the learning process.

In Chapter 5 (see 5.2.2.1 and 5.4), social context of a learning environment was explored in terms of interactions and collaborations between students, lecturers, and the external world (in terms of why and how these happen). The aim of this was to determine how to effectively model SoCeL social environment. The results of this study showed that the main objective of social interaction among students and lecturers is 'discussing assignments or class work' which is in line with what is reported in the work of Parslow et al. (2008), which indicated that Facebook, for instance, was a popular environment for discussing coursework. This study found that more than 73% of the respondents interact for that purpose, which relates to seeking help on the subjects being learned. This implies contacting and discussing with the lecturer about the subject.

These results also confirm the findings reported in other earlier studies (Bloch, 2002; Jankowska and Marshall, 2004; Navaz, 2013; Gillies, 2015). Bloch (2002), for example, reported that students contact lecturers for four main reasons phatic communication, asking

for help, making excuses, and making formal requests, and that they were able to employ a wide variety of rhetorical strategies to interact with their lecturers outside the traditional classroom setting. Social interactions enable students to take a more active role in discussions (Navaz, 2013) and thereby improving their learning process (Jankowska and Marshall, 2004) since peers and lecturers can 'stimulate and extend students' thinking capacity and enhance their learning (Gillies, 2015). Gillies argues that lecturers encourage students to engage in reciprocal dialogues where they exchange information, explore issues, interrogate ideas, and tackle problems in a cooperative environment that is supportive of these discussions.

What is important from these arguments is the fact that students prefer to have a free social environment for them to interact with their lecturers for a number of reasons which may well be beyond the formal level interaction. The findings in this study, however indicate that the student-lecturer interaction is still limited compared to student-student interaction. For example, only 36% of the students surveyed reported that they interacted with their lecturers outside the classroom. A much lower proportion of female students reported that they interacted with lecturers. When asked about why fewer females than males interact with the lecturers, the reason given to support this data seemed to suggest that social-cultural influences still pose a barrier to interaction between female students and the male-dominated staff, implying more needs to be done when adopting SoCeL. Some of the students admitted in an interview that they feared interacting freely with the lecturers especially outside classroom as they could be easily "misinterpreted" to have inappropriate relationship with the lecturer. So in order to keep their social standing among their peers, they would rather not contact their lecturers outside the classroom environment.

Therefore, this demonstrates a significant social implication to SoCeL adoption. To provide a free social environment, such obstacles should be tackled. The fact that students and lecturers come from a variety of backgrounds means that attaining a common culture for the class, where everyone understands the need for open communication, and not to be "misinterpreted", can be challenging. There may be things to be learned by both the lecturers and the students. SoCeL model proposes an environment that supports active social interactions and collaborations among students and lecturers both within the traditional classroom and in an online environment. Since these interactions can be guided and based on learning goals, and since in a blended approach, there are options for both online and face-to-face, students can be encouraged to freely participate in the way most convenient to them.

To participate in the active learning process, students get to understand their role in creating, and sharing information. As illustrated in the contextual model (Figure 5.7 in Chapter 7), SoCeL environment supports also interaction for students and lectures with the external world. This is important because it allows a wider scope of learning and socialising the learning process. Jankowska and Marshall (2004) adds that social interaction between students, lecturers, and the eternal world enhances the learning process.

7.3.2.2 Technological context

Technical context refers to the culture and infrastructure (systems, devices and services) that are adopted by the students and lecturers for the purpose of supporting the learning process. Using technology tools in higher education offers a number of benefits especially in fostering interaction between students and lecturers (Beldarrain, 2006). Technology tools are used to create, modify, aggregate, share, and access information and are therefore essential to teaching, research, learning, and the administrative activities of higher education (Jankowska and Marshall, 2004). SoCeL model provides for flip between formal and informal technology context by offering two types of instructional technology: the learning management system (LMS) and the social networking tools to foster a blended technological environment that support both formal and informal learning environment.

Chapter 5 explored the use of LMS and social networking tools by the students and lecturers. The findings show that social networking tools (especially Facebook) are preferred to LMS and this is because of many interactive features and simple design that make them more interactive and easier to use. More than 94% of the students and lecturers indicated that they have at least one social networking profile which they use for various social and educational purposes and most of these profiles (96%) are on Facebook, implying that Facebook could potentially be very instrumental in implementing SoCeL. Facebook has been used for learning support as it facilitates sharing, interaction and collaboration among its users as reported in the previous studies (Kabilan et al., 2010; Idris and Wang, 2009; Wang et al., 2012; Bosch, 2009; Parslow et al., 2008).

However, social networking tools are mostly supportive of an informal approach (Otto et al., 2015; Parslow et al., 2008) and have certain limitation to function as a formal LMS (Wang et al., 2012). Since SoCeL model proposes a blended approach to support both formal and informal instructional modes, technological context provides for 'flip adoption' for LMS and the social networking tools. The design should depend on the implementation objective. Two approaches have been proposed in this thesis: either implementing LMS with more

social and collaborative features or using SNTs with extra learning management futures, such as analytics, support for different file formats (for uploading and downloading of learning materials) and other features found in LMS. This approach relates to the work of Dalsgaard (2006) which focuses on moving e-learning beyond the LMS by using social software "to and engage students in an active use of the Web as a resource for their self-governed, problem-based and collaborative activities".

7.3.2.3 Pedagogical context

Pedagogical context refers to the extent to which a lecturer influences the learning process by learning instructions are delivered. This study explored how a lecturer could adopt a blended approach using mixed pedagogy to implement SoCeL. Using a Facebook group, for example, could successfully implement an informal pedagogy for e-learning environment (Wang et al., 2012) whereas using either Facebook or BlackBoard could implement a formal e-learning environment (Parslow et al., 2008).

What the SoCeL model proposes is the 'switched' approach in which a lecture plays the roles of both formal and informal lecturer depending on a particular learning objectives. Being both a formal and an informal lecturer can help in promoting conversation, democracy, and learning (Jeffs and Smith, 1999) to encourage students to perform the role creating and sharing information, which is important for SoCeL environment.

The results from this study (Figure 5.4) indicates that participant appreciate the use of social networking tools in promoting informal interactions making friends, chatting, and sharing information. The assumption made here is that if lecturers offer more supportive environment, informal instruction is possible more effective. One way to do this is to avail learning materials in both formal and informal formats. For instance, the use of Facebook group to post learning materials or information about the learning materials can stimulate participation, interaction, and collaboration in support of informal e-learning (Cook and Smith, 2004). The use of group work would support collaborative learning activities (Curtis and Lawson, 2001) such as peer assignment review process (Kahiigi et al., 2012) which help students to share and gain knowledge, understand course concepts and access various views and learning material (Kahiigi Kigozi et al., 2011).

7.4 Strategy for adopting SoCeL

The strategy for adoption discussed here is based on TAM and the findings from this study, presented in Figure 2.1 (on page 51). Three aspects of that model were used to develop a

strategy for adopting SoCeL in higher education. These three aspects are: external factors, user motivation, and actual use of tools. In this section, they have been used to validate the findings from this study in order to develop strategy of SoCeL adoption in higher education. A detailed integration framework was developed on that basis and it is presented in 7.5.3

7.4.1 Dealing with external factors for SoCeL adoption

External factors for SoCeL adoption are determinants representing individual differences, situational constraints, organizational characteristics and technology characteristics impacting on the user motivation and the actual use of social collaborative technologies (Saadé and Kira, 2007). These factors were categorised in 6.2.1 as social, demographic, individual, and infrastructure factors. In this chapter their effect on the adoption have been explored to provide respective recommendations, summarised in the form of a framework for adoption of SoCeL proposed in 7.5.3

7.4.1.1 Social factors

In terms of social factors, the following were identified in this study: the number of peers in the social network, the platform being used, the kind of enjoyment derived, social influence, and social presence. From the data presented in Table 6.5, 94% of students and lecturers respectively reported to have at least one social networking profile, 96% of whom have these profiles on Facebook.

This shows a strong online presence and the popularity of Facebook as a social networking tool for both students and lecturers and they enjoy using it for a number of informal activities including learning (Table 6.4). Going by the argument of Lin and Lu (2011) that an individual becomes more willing to use a particular social platform as more friends or peers join – 'social effect', it can be argued that Facebook is the most suitable to be adopted as a social collaborative platform due to 'social effect'.

7.4.1.2 Individual effect

Regarding the individual factors influencing the adoption of SoCeL, the following were investigated to determine their effect on the user's motivation to adopt social collaborative technologies: experience, time spent online, enjoyment, and ownership of ICT device. The findings that were highlighted in 6.4.3 are further analysed and presented here.

In terms of experience on the Internet usage, the result shows that the mean years of experience is 5.93 and the standard deviation of 3.65, indicating that the participants had been

exposed to use of ICT. However, to determine whether this experience had an impact on the user motivation to adopt SoCeL, the Spearman's rho (ρ) test conducted revealed a moderate positive correlation, $\rho= 0.49$ between the number of years of using Internet and perceived ease of use of social collaborative technologies but a weak negative correlation, $\rho= -0.06$ between participants' number of years of using Internet and perceived usefulness of SoCeL. This result implies that Internet usage experience has a significant effect on the user motivation in terms of perceived ease of use.

Regarding time spent online, the results showed that there was a weak positive correlation, $\rho= 0.16$ between the number of hours spent on social networking per week and perceived ease of use of social collaborative technologies. Participants who spent more hours on social networking per week reported higher levels of skill in using social collaborative technologies and a weak positive correlation, $\rho= 0.13$ between the number of hours spent on social networking per week and perceived usefulness of SoCeL. What this means is that effectiveness of SoCeL is not strongly determined by the amount of time spent online.

There are various devices that students and lecturers use to access and use social collaborative technologies. These include: desktop, laptop, tablet, or mobile phone. This study focused on determining whether or not having any one of these devices would increase the chances of effective use of social collaborative technologies. The results did not produce any evidence to suggest that there exists any relationship being owning a devices and motivation to use the social collaborative technologies.

7.4.1.3 Internet infrastructure effect

To establish what effect Internet infrastructure has on the adoption of SoCeL, this study investigated frequency of Internet access and the means of accessing it. Frequency of Internet access was measured in terms of whether or not an individual accessed the Internet on a daily basis. There were however, no statistically significant differences between daily Internet access and perceived usefulness of SoCeL. This implies that accessing the Internet on a daily basis did not have significant influence on the user's motivation to adopt the use of social collaborative technologies and is therefore not a key success factor for SoCeL.

The *Chi* square test however, showed there exist statistically significant differences in the levels of perceived ease of use of SoCeL between participants who accessed the Internet daily and those who did not, meaning that the perceived ease of use is influenced by the frequency of Internet access, making it a key success factor for SoCeL adoption

In terms of means of accessing the Internet, the study focused on effects of accessing the Internet through the office computer, home computer, and mobile devices on the perceived ease of use of social collaborative technologies. Since the study established that 77% who accessed the Internet through campus computer laboratories, there was a need to find out whether the means of Internet access had an impact on the perceived usefulness and perceived ease of use of social collaborative technologies. The Chi square tests were conducted but results revealed that there were no significant relationships between Internet access means and perceived usefulness. However, there were significant relationships between Internet access means and perceived ease of use. This implies that a user is more likely to find it easier to use social collaborative technologies if they accessed it from the campus computers. One possible explanation is that reliability of Internet connection as argued by Munguatosha et al. (2011).

The findings highlighted in 6.2.1 indicate that the perceived ease of use of social collaborative technologies was more likely influenced by external factors compared to the perceived usefulness, which relates to the educational affordance of social networking tools. Educational affordance of social networking tool is defined as abilities of a user to utilize social networking tools' capabilities for specific educational activity within socio-educational environment. Factors that determine educational affordances of these tools relate largely to the functionality of the tool, individual user's perception and the environment (Otto et al., 2015) as opposed to external factors specified here.

7.4.2 Dealing with user motivation influence

In order to check for conformity with TAM, this study focus on establishing the relationships among the three user motivation constructs: perceived usefulness, perceived ease of use, and attitude toward using as was shown by Davis (1986). Hong et al. (2003) also confirmed this in their paper, adding that there exists a connection between perception (perceived usefulness and perceived ease of use), intention (attitude toward using), and action (actual use) in the sense that perception leads to attitude which effects behaviour which creates action that are performed in defining life. From the previous studies above, it was demonstrated that attitude toward using technology results from perceived usefulness and perceived ease of use.

This study explored relationships using the data from the respondents while focusing on the extent to which perceived usefulness and perceived ease of use influenced adoption of SoCeL by university students and lecturers. The results showed that there exists a statistically

significant effect of perceived usefulness on the attitude toward using social collaborative technologies in such a way the more useful an individual perceived social collaborative technology to be the more positive attitude he/she demonstrates toward. Similarly, the easier an individual perceived the use of a tool to be, the more positive attitude he/she demonstrated towards using the tool.

The implication of this finding is that more emphasis directed towards external factors would be aimed at increasing the skill level of the users so the perceived ease of use can be improved. The finding seems to suggest that perceived usefulness is more to do with the tool itself - the educational affordance of such tools, compared to the external factors. In order to maximise the actual utilisation of the tool, both perceived ease of use and perceived usefulness must be maximised.

7.4.3 Using social collaborative technologies

As illustrated in Figure 6.1, using a particular technology tool depends on the satisfaction an individual derives from it and it corresponds to the attitude which that individual develops towards using it. It has been shown in the previous section that external factors also contribute to the development of that attitude. This study sought to determine an effective way to guide the usage of social collaborative technologies by considering the following: duration, purpose, impact of using these tools. This objective is for the implementers and developers to be able to develop and communicate to the users about the effective use of these tools for learning purposes.

In terms of what participants use these tools for, this study established (in Table 6.4) that the five top activities performed by students and lecturers on the social networking tools are: chatting, sharing information, making friends, learning, and seeking information. It was previously established that although students and lecturers use these tools for pedagogical and technological purposes, their main usage was for social purposes (Otto et al., 2015). Therefore, emphasis should be placed in ensuring that using social networking tools promotes the pedagogical activities. This can be achieved if the adoption is guided by the framework proposed in 7.5.3 enabling learning activities led usage. The design of the curriculum should prioritise learning activities that are least performed. These activities as presented in Table 6.4 include: giving feedback, collaborating on group work, lecturer/student interaction, and brainstorming.

Other than a negative impact on the academic performance, the use of social collaborative technologies can have enormous impact on the users. The findings reported in 6.3.3 indicate both the positive and negative impacts in the life of the users. In order to design an effective SoCeL environment therefore, implementers should make plans to maximise the positive impact whilst minimising the negative impact. This can also be implemented following the framework in 7.5.3 by selecting appropriate for delivery of material, mode of instruction, technology usage, and the culture to guide interaction and collaboration.

Further studies also need to focus on establishing the relationship between time spent, activities carried out, and the impact on the academic performances. This can establish a practical measure of dealing with design issues related to effective SoCeL environment.

7.5 The SoCeL integration frameworks

In addition to the theoretical and conception framework presented in Chapter 4 two frameworks are proposed in this section, these are the frameworks for a SoCeL environment and the framework for SoCeL adoption. These two frameworks aim to provide guidelines for effective integration of SoCeL in higher education and demonstrate a step towards developing SoCeL as a theory for e-learning. They represent the theoretical and practical considerations for an interactive and collaborative approach to e-learning.

7.5.1 Theoretical considerations

The frameworks have been developed on the basis of cognitivist, connectivist, and social constructivist learning theories as explained in Chapter 4. SoCeL is based on a constructivist epistemology which argues that knowledge is not acquired as a collection of abstract entities but rather, constructed in the context of the environment in which it is encountered (Welsh et al., 2012). It focuses on how students and lecturers interact and collaborate in order to construct knowledge and it outlines the implications of a cognitivist, connectivist, and constructivist view for the design of learning environments and adoption strategy, focusing on the role of technology and people in such design.

A cognitivist SoCeL environment is based on the premise that students learn best when instruction is based on their own experience and prior knowledge. It is the role of the lecturer to learn and mould students' own experience and prior knowledge and use them to facilitate further learning. Social cognitivist theory emphasizes the importance of observing and modelling behaviour, attitudes, and emotional responses of others (Dabbagh and Kitsantas,

2012). A connectivist view of SoCeL is that students have opportunity to access vast amount of information from several sources (specialized nodes) and they learn through the process of connecting these specialized nodes or information sources (Siemens, 2005). The lecturer's role therefore should be to enable students to see connections between fields, ideas, and concepts in order to choose what to learn and the meaning of incoming information from the various sources. In a constructivist SoCeL environment a lecturer acts as a facilitator to encourage students to discover principles for themselves and to construct knowledge based on their existing knowledge (Papasratorn and Wangpipatwong, 2005). Sun and Williams (2004) also demonstrated idea of a constructivist design of e-learning environment through an instructional model which supports students' construction of knowledge, which is in line with the proposed SoCeL environment. The works of these authors focused on instructional design of courseware for e-learning such that the role of the students in initiating the learning is emphasized. They also argued in another paper that "students normally participate in learning as a personal and social construction of knowledge, and development of critical-thinking and problem-solving skills" (Sun et al., 2004). SoCeL model emphasizes the role of the lecturer in formulating learning activities that encourage students to interact and collaborate as they construct knowledge.

Therefore, the design of learning activities should allow for a blended model of learning in which students are engaged and challenged to participate, construct and share knowledge and the lecturer should facilitate learning by employing a blended model of learning, guided by the 'switched' approach as specified in the frameworks illustrated in 7.5.2.

7.5.2 A framework for SoCeL blended environment

The framework for the SoCeL blended environment illustrated in Figure 7.1 depicts the kind of environment suitable for implemented SoCeL as a blended learning model which supports an environment with integrated design approach in terms of learning materials, pedagogy, technology, and the people. A blended learning environment provides the potential to support deep and meaningful learning (Garrison and Kanuka, 2004). For a meaningful learning, this framework proposes the design of a SoCeL environment involving blending method of delivery (Online and face-to-face), mode of instruction (formal and informal), learning technology platform (LMS and social networking tool), and the role of the people involved in the learning process (student and lecturer). The framework provides as a central design

objective, there should be a series of interactive and collaborative learning activities in order to ensure an effective and open communication between student and lecturer occurs. It is recommended that a design decision is based on assessing what level of blending is effective for a particular class and course considering the four elements mentioned above.
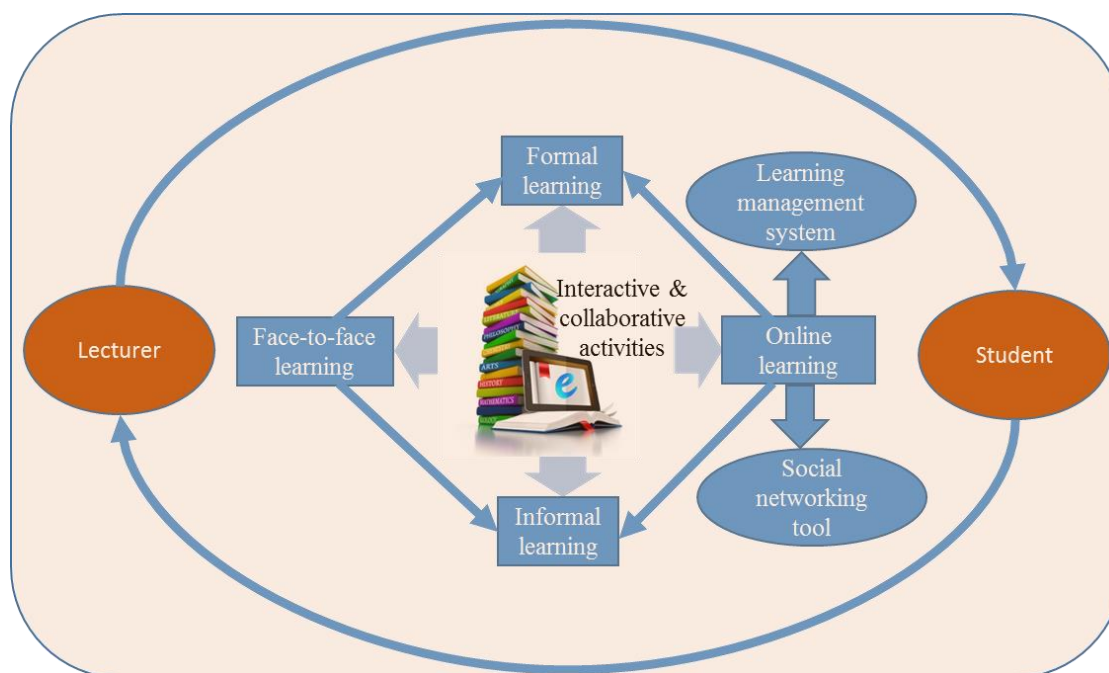
Figure 7.1 A framework for SoCeL blended environment

7.5.2.1 Learning materials

The SoCeL blended environment suggests that as a central design objective, interactive and collaborative learning activities are needed in order to ensure there is effective and open communication between student and lecturer. Therefore, the learning materials should be developed in a way that makes it possible for this objective to be achieved and to support alternative delivery methods, learning mode, and access mechanisms, utilising the available resources. Understanding the backgrounds of the students may help in determining how to prepare the materials for SoCeL blended environment.

7.5.2.2 Mode of instruction

In an e-learning environment, the discourse and activities are largely regulated by the students (Garrison, 2011) therefore, instruction requires exploring and learning of students in order to provide effective managing and monitoring of the learning process. Providing both formal and informal instruction means that the lecturer should structure, shape, and assess the learning experience – formal instruction and allow students to explore, interact and share

without and formal structure- informal. As argued by Otto and Williams (2014b), an effective way to blend the learning environment in terms of mode of instruction, is to adopt informal learning strategies within formal educational programmes in order to scaffold instruction.

7.5.2.3 Technology

Using a particular technology is influenced by several factors as discussed in section 7.4. The framework for the SoCeL blended environment suggests however that an approach involving the use of LMS and social networking tools be adopted. This is in consideration of the main objective of the SoCeL model which emphasizes interaction and collaboration in a learning environment.

Building an interactive and collaborative e-learning platform should consider the use of LMS and social software (Dalsgaard, 2006) since it has become necessary to move e-learning beyond learning management systems and engage students in an active use of the Web as a resource for their learning activities. This can support formal and informal learning in a way that increases student's motivation and participation.

This study found that although LMS have been implemented in both institutions in Uganda, more than 94 % of students and lecturers have social networking profile and they do engage in informal learning activities such as chatting, searching and sharing of information, which can be integrated within the formal programme. Some of the participants expressed their preference of using social networking tools for learning purposes. In the light of these findings therefore, the framework provides use of both platforms, giving the lecturers or the course designer to decide which platform to adopt for a particular subject, learning activity, goal, or time.

7.5.2.4 The people

The framework includes the role of students and lecturer in a switched way, suggesting that student plays the role of creating knowledge and sharing it (instruction) whereas the lecturer also does the receiving and accumulating knowledge (learning) from the student. The main aim of the SoCeL model of learning is to facilitate interaction and collaboration. The lecturer, having a role in facilitating discourse in an e-learning experience (Garrison, 2011), should design learning activities that promote open communication so students can freely interact with other students and the lecturer.

Open communication is built through a process of recognising, complimenting, and responding to questions and interactions. The lecturer could do this if he/she listens to students and learns from them, encouraging students to have reflective participation and

creating, and sharing their own knowledge. As suggested by Jeffs and Smith (1999) the lecturer should decide when and how the swapping roles is best done depending so as to allow students 'instruct' and the lecturer to 'learn'.

In terms of collaborative learning, the role of the lecturer is to promote learning in small groups, which can be formed for face-to-face or online collaborations. The focus should be on how students can learn from their peers during small-group work, how lecturers can prepare students for collaborative group work, and the role of lecturer discourse and classroom norms in small-group dialogue (Webb, 2009). The practical guideline for this framework is that the lecturer recognizes this roles and designs and environment that allows flipping depending of students and the subject. In a small group, for example, one of the students may play the role of the lecturer whilst sharing own knowledge and a lecturer may also participate in the group as one of the students.

This framework emphasizes that there should be flexibility in flipping the roles of learning and instruction in terms of interaction and collaboration so the is learning from each other. The lecturer will learn from the student and vice versa in a way that promotes interaction and collaboration towards achievement of learning activities.

7.5.3 A framework for SoCeL adoption

In Figure 7.2, a framework for SoCeL adoption is illustrated based on TAM and the findings on the factors responsible for the use of a learning technology as discussed in 7.4. The framework includes four external factors (external variables), user motivation factors (internal variables), and the actual use (using social collaborative technologies). The external variables have been categorised into four: social, demographic, individual, and Internet infrastructure. Internal variables include perceived usefulness of SoCeL, perceived ease of use of social collaborative technologies, and attitude toward SoCeL. The choice of what social collaborative technology to be used should be guided by the learning goals, activities, and time available in order to facilitate an effective monitoring and evaluation. The framework includes only those variables with significant influence on adoption as revealed by the findings discussed in 7.4. The relationships indicated by the solid arrows represent strong relationships (more influence). The ones indicated by dotted arrows represent weak relationships (less influence) on the dependent variables.
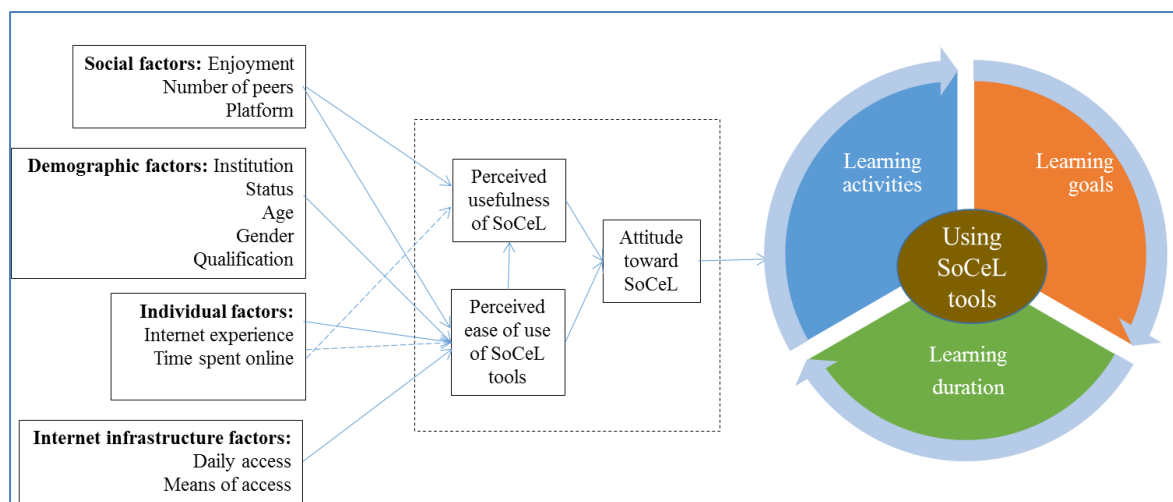
Figure 7.2 A framework for SoCeL adoption

Deciding which tools to use should depend on the learning goals, activities, and external factors and should be cognisant of the learning environment set out.

7.6 Chapter summary

A discussion summaring the three aspects of SoCel model based the findings in presented in the earlier chapters was presented in 7.2, 7.3, and 7.4. The discussion focused on the justification, implication, and recommendation based on the findings regarding concepts, environment and adoption of SoCeL in higher education. The model, which is based on the blended learning approach provided two implementation frameworks for effective integration of SoCeL in higher education. The two frameworks sought to guide the design of SoCeL environment and use of social collaborative technologies for effective learning output.

Chapter 8

Conclusions and Future Work

This chapter presents a recap of the research and conclusions which were drawn from the findings presented and discussed in the preceding chapters. In addition, recommendations on how to implement use of social collaborative technologies in higher education is presented. This is intended to provide guidance to researchers and practitioners in the contexts similar to those discussed in this thesis. Finally, suggestions for future work within this research domain have also been highlighted in this thesis.

8.1 Summary of the research

e-Learning has become an important mode of learning within the higher education institutions throughout the world. The fact that emerging technologies are influencing the approach of e-learning cannot be overlooked. As social collaborative technologies become easily available to students and lecturer, the approach to e-learning continues to evolve. These technologies support social interactions and educational collaborations among students and lecturers making it clear that for any successful implementation of SoCeL, learning environments and strategies that support it must be addressed.

SoCeL is a new paradigm of modern education that promises to change the traditional concept of e-learning to a more agile approach of blended e-learning involving the use of social collaborative technologies including learning management systems (LMS) and social networking tools (such as, Facebook and Twitter). These technologies can facilitate social interactions and educational collaborations in a way that transforms learning ubiquitously. The aim of SoCeL as a model of learning is to provide design of environment and strategies for adoption of e-learning using these already widely available social collaborative tools. This study focused on how this can be effectively done in the context of higher education in a developing country. The results from this study can be used as starting point for

implementing SoCeL in higher education and further studies in order to make it a 21st century learning theory.

8.2 Research findings and recommendations

The findings summarised here are grouped into four areas: learning method, learning contexts, factors for adoption of SoCeL, and actual use of social collaborative technologies.

8.2.1 Delivery of learning material

Although most courses are delivered through the traditional face-to-face method, there is evidence that most students and lecturers prefer a blended approach. Both students and lecturers advocated for a blended approach that has the following elements: mixed instructional modality (in terms of delivery media), mixed instructional modes (informal / formal) and blended instruction (online/ face-to-face). The argument supporting this relates to the nature of individual courses and varied interests of individual students. For example, some aspects of a practical courses are best delivered through face-to-face, whilst others through online. Some students find it easier to follow a course online compared to when offered through face-to-face.

Recommendation 1: In order to maximise the impact of learning material delivery, it would be essential for the course lecturer to evaluate the nature course and the learning styles of the students before deciding on how to blend the delivery approach. This would enable the lecturer to determine what approach and the degree of 'blending' would best work for a particular subject or course unit.

8.2.2 Learning contexts

There is still a challenge in designing an environment that encourages SoCeL. Learning design should adopt an integrated learning environment including social, technological, and pedagogical considerations.

a) Learning environment is characterised by the culture of active interactions and collaborations outside of the classroom especially among students themselves. Although students reported that that they interact with lecturers and the external world, most interactions occur among students themselves and are mainly prompted by the need to discuss class related work. This demonstrates the significance of social culture in e-

learning environments. It should be an objective of the course developers and implementers to try and encourage community spaces which stimulates the culture of free interactions for both lecturers and students so both explicit and implicit or tacit knowledge gets to be shared. The study also found evidence that females were less likely to freely interact with the male lecturers.

Recommendation 2: In order to address the issue of free participation and interaction within the learning spaces, establishing a code of conduct would be necessary. This could guide interactions, promote trust and build favourable cultural environment that stimulate and maintain such interactions. However, due consideration should be made to avoid making an impression that individuals could get under surveillance as this could instead discourage free participation.

b) In terms of technological aspects, the study found evidence that social networking tools are more popular than the LMS. The LMS platforms such as Blackboard and Moodle are implemented in a top-down fashion, whereby the institutions provide the tool to the students and instruct them to use it but students prefer to adopt a more informal, bottom up approach of using social networking tools such as Facebook and Twitter. More than 95% of students have at least one social networking profile, 96% of these profiles are on Facebook making it the easier to adopt this as the main learning platform although having a number of them could be a better option. There are those who are still sceptical about using social networking however, their concerns can be easily addressed and have them participate in online interactions to promote learning.

Recommendation 3: Having a number of tools available to students would encourage individual choices and it this would encourage students to use the platform with which they are more familiar. However, awareness on the features of each of the available tools should be made so as to improve the general usage skills.

Recommendation 4: For maximum use of technology to support learning, the role of a lecturer is significantly increased. It is recommended that a way to motivate and reward the effort of the lecturers be established. For example, currently lecturers who publish research papers are rewarded in terms of promotion. Similarly, awarding

'credits' in terms of workload corresponding to the work the lecturer does in encouraging and supporting SoCeL could be productive.

c) Although it was clear that both students and lectures are using social networking tools to support the learning process, there was little evidence to show that an effective pedagogical approach was adopted. Therefore, the use of these tools are mostly to for social purposes yet there are great opportunities to earnest their pedagogical affordances.

Recommendation 5: Lectures should be guided on how to formally and informally deliver instructions and learning materials using these tools.

8.2.3 Factors influencing adoption of SoCeL

This study established that a number of external factors determine the extent to which students and lectures adopt the use of social collaborative technologies. These factors are grouped in to four domains, namely: social, demographic, individual, and institutional factors as listed below:

a) Social factors such as the number of online peers and technology platform, contribute to the adoption of SoCeL – this is called 'social effect' or need for social support in helping an individual user get engaged in an online network.

    i.   Having profile: This is where online social presence begins, the first step towards online without which adoption of SoCeL may not be possible since social engagement occurs through the use of a profile. Students were found to be more likely to have an online social presence compared to lecturers. Similarly, males were more likely to have an online social networking profile compared to their female counterparts. Therefore, there is a need to encourage lecturers and the females to increase their social presence in order to improve the level of social effect and this can be backed up with sensitisation and a change management process.

    ii.   Number of peers: The findings in this study suggest that the more the number of peers one has online, the greater the social effect. In other words, a user with more online 'friends' is more likely to be more engaged on the social collaborative platform.

iii. Technology platform: In terms of choice of technology platform, the more common a platform is, the greater the social effect. In this case, Facebook, being the most commonly used platform has the greatest social effect.

b) Demographic factors reflect on an individual's capability and motivation to adopt the use of social collaborative technologies. This is called the 'demographic effect'- effects relating to the cultural and natural attributes of a user. This study showed that there are statistically significant relationships between the demographic factors and the perceived ease of use of technology. However, the study didn't find any evidence that there was a significant demographic effect on the perceived usefulness of social collaborative.

c) Individual factors such as experience and time spent on social networking tools influence the adoption of SoCeL – 'individual effect'. In terms of user internal motivation to adopt such tools, the study found evidence of a weak positive correlation between the number of hours spent on social networking per week and perceived usefulness of SoCeL. This implies that users who spent more hours spent on social networking activities were more likely to perceive the usefulness of this tools to adopt SoCeL. However, there was weak negative correlation between participants' number of years of using Internet and perceived usefulness of social collaborative technology, implying that as one continues to use Internet, the perceived level of usefulness of social collaborative technologies declines.

d) Infrastructure factors (like frequency of Internet access) were found to have significant effect on the user's motivation to adopt SoCeL. The study found that there were statistically significant differences in the levels of perceived ease of use of social collaborative technology between participants who accessed Internet daily and those who did not access on daily basis. This result meant that daily access to Internet increases the levels of perceived ease of use of social collaborative technologies and thus, efforts should be made to ensure unhindered access to Internet.

Recommendation 6: Before choosing what social collaborative technology to be adopted, an evaluation should be done to establish the specific factors that could support or discourage effective use in a learning environment. If the lecturer understands the social, demographic, individual and infrastructural issues within the learning institution, it would be easier to determine what can be adopted

8.2.4 Actual use of social collaborative technologies

The findings of this study on the actual use of social collaborative technologies by university students and lecturers have been described in terms of time spent, purpose of using, and the impact of using such tools.

a) Time spent: users spent on average more than 2 and half hours on social networking per day, which is a significant amount of time, which if not effectively used for learning, can be a negative factor towards the academic performance.

b) Purpose of use: These include chatting, sharing information, making friends, learning, and seeking information were top activities participants involved in whilst using social networking tools. Whereas there are many factors that affect the actual use of social collaborative technologies, some are significant to both students and lecturers while others are specific to a group.

c) Impact of use: There were both positive and negative effects on the those who used these tools. Addressing the negative concerns whilst make users more aware of these impact can be useful in promoting adoption and any other course of action.

Recommendation 7: In order to maximise the effective use of a particular social collaborative technology, there should be a clear purpose of use and time set aside for some formal interaction between students and a lecturer. There should also be some moments to talk about the impact of using these tools in a way that experiences can be shared to encourage positive impact and reduce negative impacts.

8.3 Contributions to knowledge

A number of contributions have been made by this study in terms of the thesis it and published papers. Sections 8.3.1 and 8.3.2 summarise these contributions.

8.3.1 Areas of contribution to knowledge

This research follows a combination of approaches in exploring the integration of SoCeL in higher education from the perspective of developing countries and therefore it is important to draw out where contributions to the body of knowledge have been made. The four broad areas of novel contributions from this work are:

a) SoCeL conceptual framework
b) SoCeL environment

c) Adoption of SoCeL

d) Integrating SoCeL

Although many agree that 21st century e-learning should facilitate online learning through networking technologies, the current research efforts have yet to produce a framework to guide effective integration of these technologies in higher education. For example, recent studies show that the use of readily available social networking tools such as Facebook and Twitter have significantly increased in higher education but there is little evidence to show their success. This research attempts to fill this gap by presenting an important model for the 21st century e-learning – the SoCeL model (see Figure 3.1 in section 3.1). The conceptualisation of SoCeL follows an integrated approach aimed at bring together three key concepts: informal learning (Section 3.3), social networking (section 3.4), and learning management (section 3.5). The conceptual framework for SoCeL produced in this research is aimed at guiding the research community as well as practitioners on the design of learning environment and adoption of technologies that support interactive and collaborative blended learning in higher education. For the research community, three broad areas of inquiry have been established in this framework are: managing informal e-learning (section 2.5.1), educational affordance of social networking technology (section 2.5.2), and managing collaborative e-learning (section 2.5.3). For practitioners in higher education, recommendations of how to effectively integrate SoCeL have been provided (sections 7.3, 7.4, 7.5, and 8.2).

In terms of learning environment, this study produced the SoCeL contextual model, highlighting how to design and effective environment for e-learning following the SoCeL model (see Figure 5.7 in section 5.6). This model emphasizes the role of learning materials and instruction in formal and informal environment. It also provides for use of various social collaborative technologies including LMS and the social networking tools. In short, the model places significant focus on the social, technological and pedagogical aspect of learning in an integrated e-learning environment.

The SoCeL adoption explored in Chapter 6 reveals the factors that influence the use of social collaborative technologies in the context of the study. The knowledge gained from this study can be used to validate in similar studies and the methods applied can be adopted for related studies.

Finally, in terms of integration of SoCeL, this studies makes contributions of two integration frameworks to guide the development of SoCeL environment and its adoption in higher education (sections 7.3, 7.4, 7.5).

8.3.2 Publications

The following publications were produced during the study time:

a) **Paper 1:** Otto, F. & Williams, S. (2014). Official use of Social Network Sites by African Universities. In: Pan African International Conference on Science, Computing and Telecommunications (PACT), 2014 Arusha, Tanzania. IEEE, 46-51.

b) **Paper 2:** Otto, F. & Williams, S. (2014). Social Collaborative e-Learning in Higher Education: Exploring the Role of Informal Learning. E-Learning, E-Education, and Online Training. Springer.

c) **Paper 3:** Otto, F., Badrul, N. A., Williams, S. & Lundqvist, K. Ø. (2015). Students' Perception of Privacy Risks in Using Social Networking Sites for Learning: A Study of Uganda Christian University. E-Learning, E-Education, and Online Training. Springer.

d) **Paper 4:** Otto, F., Williams, S. & Lundqvist, K. Ø. (2015). Using Social Networking Tools for Teaching and Learning: A Perspective of University Lecturers and Students. E-Learning, E-Education, and Online Training. Springer.

e) **Paper 5:** Otto, F., Williams, S. & Lundqvist, Ø. K. (2015). Integrating Social Collaborative E-Learning (SoCeL) in Higher Education: The Conceptual and Theoretical Framework. In: Pan African Conference on Science, Computing and Telecommunications (PACT), 27-29, July 2015 Kampala, Uganda. IEEE.

8.4 Limitations of the research

a) Participants selection limitation: This study applied a mixed method approach including use of case study. However as Tellis (1997) pointed out, a frequent criticism of case study methodology is that its incapable of providing a generalizing conclusion especially if it is dependent on a single case. Yin (1993) however presented Giddens' (1984) views that considered case methodology "microscopic" because it "lacked a sufficient number" of cases. This attempt suggests that a number of case studies should be considered for a more complete study. However, Hamel et al. (1993) and Yin (1989; 1984; 1993; 2009; 2011) strongly argued that if the relative size of the sample whether 2, 10, or 100 cases are used, does not transform a multiple case into a macroscopic study. Although this study adopted multiple case approach, the limitation in terms of participant selection still prevailed to the extent that warranted choice based on purposive sampling. Since participation was also voluntary, realising a truly representative sample was not possible. But since this study was more qualitative and generalisation was not the aim, this could suffice.

b) The other limitation relates to broadening of the scope of research. For instance, one of the criteria for case selection was based on the assumption that students understood and were using learning management system (LMS). During analysis however, it was discovered from the survey responses that there was inadequate knowledge on LMS and its implementation in the two universities that were selected. As a result, limited discussion for focused on LMS but social networking tools which appeared to be the most readily available and widely used by both students and lecturers. Future work should therefor use different approach in studying use of LMS following the SoCeL model. Future studies should also focus on managing informal e-learning and managing collaborative e-learning using learning analytics.

c) Implementation and evaluation: The frameworks for integration were validated using existing theories in literature. However, an implementation and testing could have been conducted using further field study.

8.5 Suggestions for future work

The following are areas where further investigation could be done in order to support SoCeL becoming one of the learning theories in the 21st century:

a) Integrating informal with formal learning: Further work could focus on how to use informal leaning strategies within the formal course design. It may be interesting to consider investigating the effect of incorporating deliberative activities (as discussed in section 3.3.1) within the formal course design and making them part of the normal life of students. These informal (deliberative) learning activities such as planning and problem solving should have clear 'work-based' goals that could result into learning.

b) Learning analytics: linking multiple online identities of students (actors) and their contributions and activities across several social collaborative technologies in order to study their learning behaviours in open online environments.

c) Next generation learning management systems: This study showed that both lecturers and student share the belief that the current LMS do not suit their needs. Many of participants expressed their dissatisfaction for the current LMS in their institutions. Many did not even know what LMS was about yet they were comfortable using Facebook for learning. Future work could be directed to assessing the current LMS implementation with the view of understanding what users would like to have and what can inform the developers and practitioner.

d) Impact on academic performance: Further studies are recommended in order to evaluate the impact of adoption of SoCeL. One of the measures could be the grade point average (GPA). Although there are several studies (de-Marcos et al., 2016; Bhaskar, 2012; Vivian and Barnes, 2010; Hung and Yuen, 2010) that claim that use of social collaborative technologies potential benefits in term of improving learning, others (Camus et al., 2016; Mingle and Adams, 2015; Paul et al., 2012; Junco, 2012b; Kirschner and Karpinski, 2010)claim that they can negatively affect the performance of students. In order to establish the true effect on academic performance, further studies would be essential.

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Appendices

Appendix A: Survey questionnaire for lecturers

Research Ethics Committee

University of Reading

Lecturers' Perspective on Adoption of Social Collaborative E-Learning Technology

This is the first stage of a study aimed at exploring adoption of social collaborative e-learning at a university level education. This survey is intended to establish your views, perception, experience and expectations on the use of social collaborative e-learning technology.

Introduction:

Social collaborative e-learning technology is an approach involving use of social collaborative technologies such as Facebook and Twitter to support interactive and collaborative
learning environments characterised by informal interactions, educational collaborations, and social networking.

A. Personal Background

University: _____

Age group: 18-25 / 26-30 / 31-35/ 36-40 / 41-45 / Over 45 /   Prefer not to say

Gender: Male / Female / Prefer not to say

Department: _____

B. Internet Access and Skills

1. How many years have you been using the Internet? _____

2. How do you access Internet? (Check those that apply)

   ☐ Campus Computer Lab
   ☐ Public Internet Café
   ☐ Office
   ☐ Home
   ☐ Mobile Device(s)

3. Which of these ICT devices do you own? (Check those that apply)

   ☐ Desktop
   ☐ Laptop
   ☐ Tablet
   ☐ Mobile Phone

4. Which of the above ICT devices would you most like to use for teaching purposes?

   First choice: _____

   Second Choice: _____

Third Choice: [   ]

Comments (optional): [   ]

5. Do you access Internet every day? Yes / No

6. How many hours do you spend online per week? [   ]

7. How would you rate your Internet usage skills? Advanced/ Skilled / Learner / Never Used

C. Current Learning Practices

1. Have you had any of your course units delivered through any of the following? (check those that apply)

   ☐ Face-to-face
   ☐ Online
   ☐ Blended (partly face-to-face and partly online)

2. Which of the above modes of learning would you prefer?

   First choice: [   ]

   Second Choice: [   ]

   Comments (optional): [   ]

3. Outside classroom, which of the following groups do you interact with? (Check those that apply)

   ☐ Students
   ☐ Fellow lecturers
   ☐ Others (specify………………………………….)

4. Do you initiate such interactions?   Yes/ No / Sometimes

5. If you have ever interacted, what were the objectives of your interactions (Check those that apply)

   ☐ Sharing your own past experiences
   ☐ Expressing you own opinions and facts
   ☐ Demonstrate what you learning on your own
   ☐ Discussing or reviewing past activities
   ☐ Solving current problems
   ☐ Setting your goals and sharing them
   ☐ Discussing assignments or class work
   ☐ Engaging in other social activities
   ☐ Passing time and leisure

D. Online Social Networking

1. Do you have social networking presence (social media profile)? Yes / No / Don't know

2. If you don't have any social media profile, what is the reason for not having? (Provide your response then go to 6)

   [   ]

3. Which social networking platform do you use? (Check those that apply)

☐ Facebook
☐ Twitter
☐ LinkedIn
☐ Google+
☐ YouTube
☐ Skype
☐ Other specify (………………………………………………..)

4. What do you use your social networking site for? (Check those that apply)

☐ Making friends
☐ Chatting
☐ Learning
☐ Sharing information
☐ Collaborating,
☐ Giving feedback
☐ Seeking information
☐ Brainstorming
☐ Entertainment
☐ Checking other friends' pages
☐ Getting news
☐ Disseminating information and interacting with students
☐ Others, specify

5. On average, how many hours do you spend on social media per week?

6. What do you say about usefulness of social media for educational purpose?
   Very useful / Useful / Not useful / Not sure

7. What do you think is the greatest positive impact of using social media in teaching?

8. What do you think is the most negative impact of using media in teaching?

E. Learning technologies

1. Do you have a learning management system (LMS) in your department?   Yes / No / Not sure

2. Which learning management platform do you use? (Check those that apply)

☐ Moodle
☐ Canvas
☐ Blackboard
☐ Webstudy
☐ Click2Learn
☐ Other, specify

3. How satisfied are you with the current LMS platform that you have?
☐ Very satisfied
☐ Satisfied
☐ Not sure
☐ Dissatisfied

What is your opinion about adopting social collaborative learning technology in your teaching process? (*Social collaborative e-learning supports the concept of 'construction of knowledge' whereby learners engage with new knowledge whilst building on their experiences. Normally through interactions and collaborations with peers and instructors*)

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4. What do you expect to be done in order to improve your teaching processes?

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F. Future Participation

1. Would you like to be contacted at a later stage for further information relating this study? Yes   No

2. If yes, can you provide your contact (Phone…………..……….., email……………………………..…..)

Thank you very much for taking time to complete this questionnaire

Appendix B: Survey questionnaire for students

Research Ethics Committee

University of Reading

Students' Perspective on Adoption of Social Collaborative E-Learning Technology

This is the first stage of a study aimed at exploring adoption of social collaborative e-learning at a university level education. This survey is intended to establish your views, perception, experience and expectations on the use of social collaborative e-learning technology.

Definition:

Social collaborative e-learning technology is an approach involving use of social collaborative technologies such as Facebook and Twitter to support interactive and collaborative learning environments characterised by informal interactions, educational collaborations, and social networking.

A.   Personal Background

University:

Age group: 18-25 / 26-30 / 31-35 / 36-40 / 41-45 / Over 45 /   Prefer not to say

Gender: Male /   Female / Prefer not to say

Programme:

Programme Level: Diploma / Bachelor / Master / PhD / Other (specify…………………)

B.   Internet Access and Skills

8.   How many years have you been using the Internet?

9.   How do you access Internet? (Check those that apply)

☐ Campus Computer Lab
☐ Public Internet Café
☐ Office Computer
☐ Home Computer
☐ Mobile Device(s)

10.   Which of these ICT devices do you own? (Check those that apply)

☐ Desktop
☐ Laptop
☐ Tablet
☐ Mobile Phone

11.   Which of the above ICT devices would you most like to use for learning purposes?

First choice:

Second Choice:

Third Choice:

Comments (optional):

12. Do you access Internet every day? Yes /   No

13. On average, how many hours do you spend online per week?

14. How would you rate your Internet usage skills?   Advanced / Skilled / Learner / Never Used

C. Current Learning Practices

6. Have you had any of your course units delivered through any of the following? (Check those that apply)

☐ Face-to-face
☐ Online
☐ Blended (partly face-to-face and partly online)

7. Which of the above modes of learning would you prefer?

First choice:

Second Choice:

Comments (optional):

8. Outside classroom, which of the following groups do you interact with? (check those that apply)

☐ Fellow students
☐ Lecturers
☐ Others (specify...)

9. Do you initiate such interactions?   Yes / No / Sometimes

10. If you have ever interacted with fellow students and or lecturers, what were the objectives of your interactions (check those that apply)

☐ Sharing your own past experiences
☐ Expressing you own opinions and facts
☐ Demonstrate what you learning on your own
☐ Discussing or reviewing past activities
☐ Solving current problems
☐ Setting your goals and sharing them
☐ Discussing assignments or class work
☐ Engaging in other social activities
☐ Passing time and leisure

D. Online Social Networking

9. Do you have any social networking presence (social media profile)? Yes / No / Don't know

10. If you don't have any social media profile, what is the reason for not having? (Provide response and go to 6)

11. Which social networking platform do you use? (check those that apply)

- ☐ Facebook
- ☐ Twitter
- ☐ LinkedIn
- ☐ Google+
- ☐ YouTube
- ☐ Skype
- ☐ Others, specify [   ]

12. What do you use your social networking profile for? (check those that apply)

- ☐ Making friends
- ☐ Chatting
- ☐ Learning
- ☐ Sharing information
- ☐ Collaborating
- ☐ Giving feedback
- ☐ Seeking information
- ☐ Brainstorming
- ☐ Entertainment
- ☐ Checking other friends' pages
- ☐ Getting news
- ☐ Contacting and interacting with Lecturers
- ☐ Others, specify [   ]

13. On average, how many hours do you spend on social media site per week? [   ]

14. What do you say about usefulness of social networking site for educational purpose?
    Very useful / Useful / Not useful / Not sure

15. What do you think is the greatest positive impact of using social media in learning?

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16. What do you think is the most negative impact of using social media in learning?

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E. Learning technologies

5. Do you have a learning management system (LMS) in your institution?   Yes / No   Not sure

6. Which learning management platform do you use? (check those that apply)

- ☐ Moodle
- ☐ Canvas
- ☐ Blackboard
- ☐ Webstudy
- ☐ Click2Learn
- ☐ Others, specify [   ]

7. How satisfied are you with your current learning management platform?
   Very satisfied / Satisfied / Not sure / Dissatisfied

8. What is your opinion about adopting social collaborative e-learning technology in your learning process?

(Social collaborative e-learning supports the concept of 'construction of knowledge' whereby learners engage with new knowledge whilst building on their experiences. Normally through interactions and collaborations with peers and instructors)

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9. What do you expect to be done in order to improve your learning experiences?

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F. Future Participation

3. Would you like to be contacted at a later stage for further information relating this study? Yes   No

4. If yes, can you provide your contact (Phone…………..………., email……………………………..…..)

Thank you very much for taking time to complete this questionnaire

Appendix C: General interview guide

Research Ethics Committee

University of READING

Exploring Adoption of Social Collaborative e-Learning Technology in Higher Education

General interview guide for students

Ethical consideration:

This is the study aimed at exploring adoption of social collaborative e-learning at a university level education. The interview is intended to establish your perspective on the use of social collaborative e-learning technology in your university. This (taking about 30 minutes) will be recorded with your permission in order to analyse at a later date. There are also other important considerations in the information sheet and consent form given to you. May I ask if you consent to this?

Introduction:

I would like you to tell me your views on how social collaborative e-learning is taking root at your university. However, I have some key issues that I hope we will go through during this interview, so I may have to check my prompts occasionally to make sure we are on track.

Definition: Social collaborative e-learning may be referred to as a pedagogical approach in which learning takes place via social interaction and collaboration using the Internet. This kind of learning is characterized by the informal sharing and construction of knowledge among participants using social networking technology and or enhanced learning management systems (LMS) as their primary means of communication or as a common resource

Questions:

1. **Education background information**

   Before we get into the main discussion, please tell me about your education history

   Probe to ensure that the following are considered

- Your academic background
- What courses you are enrolled for
- Number of years in the course

2. **Social collaborative e-learning**

To ensure that we at the same footing, let us start by you sharing with me your understanding of Social collaborative e-learning (SoCeL).

Probe to ensure that the following are considered

- Your definition/description of SoCeL?
- What do you think should be involved in SoCeL? Give me reasons.
- What kind of activities would you include or exclude as SoCeL activities? Students may choose from the following: informal learning/ interactions, social networking, using learning management systems (LMS), sharing ideas with colleagues online, chatting with lectures, On-line learning

Probe as required- Which SoCeL activities do you prefer? Why?

3. **Internet access and skills**

Internet access and skill is crucial in attaining SoCeL so it's important that you share your own experiences openly on this topic.

a) How long have you been using Internet and what is your major means of access? (Computer lab, Internet Café, Personal device e.g. Desktop, Laptop, Tablet, or Mobile Phone)
b) What is the most reliable and preferred access means?
c) How many hours do you spend online per week?

May need to probe to ensure that the following are considered

- The major online activities engaged in
- Level of Internet usage skill (learner, skilled, advanced)

4. **Current learning practices in your university**

We can now move on and talk about the current learning practices that you engage in at your university.

a) What is the primary mode of learning of your courses (for example using Face-to-face, Online, or Blended)?
b) Do you often interact with your lecturers in any way (face-to-face or online)?
c) Would you like to share your experience while you interact with your lecturers? Especially the objectives and the nature of interactions:
   i. Sharing your own past experiences
   ii. Expressing you own opinions and facts
   iii. Demonstrate what you learning on your own
   iv. Discussing or reviewing past activities
   v. Solving current problems
   vi. Setting your goals and sharing them
   vii. Discussing assignments or class work
   viii. Engaging in other social activities
   ix. Passing time and leisure

5. **Online Social Networking**

I am interested in knowing your views on online social networking and how this may influence e-learning

a) Do you have any social networking presence (a personal social media profile)?
   If yes;
b) Which platforms do you use (Facebook, Twitter, LinkedIn, YouTube, Google+, etc.)
c) What do you use your social networking profile for? (e.g. Making friends, Chatting, Learning, Sharing information)
d) Have you ever used social media in any of the classes you attend and what has been your experience if you have ever used it?
e) What is your own opinion about using social media for educational purpose?

   If no;
f) What is the reason for not having?

   Probe to ensure that the following are considered
      How social media may be effectively used to improve learning

6. **Leaning management technologies**

Finally, it is my belief that developers of LMS should listen to your opinion on the current technologies. From your point of view, what is the main message that developers of LMS should be aware of and what would you like to see in the future in relation to the next generation of learning management systems?

a) What learning management system (LMS) do you use in your university?
b) Would you like to share your experience on the use of these LMS platforms in regards to merits and demerits?
c) What is your opinion about adopting social collaborative learning technology in your learning process using enhanced LMS?
d) Considering the current features of LMS you have, what do you expect to be done in order to improve the current learning process in your institution using this approach of social collaboration?

Thank you for your time and corporation

If you think of anything else, or have any queries, please contact me – details are on the information sheet provided.

Research Ethics Committee

University of Reading

Exploring Adoption of Social Collaborative e-Learning Technology in Higher Education

General interview guide for Lecturers

Ethical consideration:

This is the study aimed at exploring adoption of social collaborative e-learning at a university level education. The interview is intended to establish your perspective on the use of social collaborative e-learning technology in your university. This (taking about 30 minutes) will be recorded with your permission in order to analyse at a later date. There are also other important considerations in the information sheet and consent form given to you. May I ask if you consent to this?

Introduction:

I would like you to tell me your views on how social collaborative e-learning is taking root at your university. However, I have some key issues that I hope we will go through during this interview, so I may have to check my prompts occasionally to make sure we are on track.

Definition: Social collaborative e-learning may be referred to as a pedagogical approach in which learning takes place via social interaction and collaboration using the Internet. This kind of learning is characterized by the informal sharing and construction of knowledge among participants using social networking technology and or enhanced learning management systems (LMS) as their primary means of communication or as a common resource

Questions:

1. **Education background information**

   Before we get into the main discussion, please tell me about your career history

   Probe to ensure that the following are considered

   - Your academic background

- What courses you are teaching
- Number of years in the teaching

2. **Social collaborative e-learning**

To ensure that we at the same footing, let us start by you sharing with me your understanding of Social collaborative e-learning (SoCeL).

Probe to ensure that the following are considered

- Your definition/description of SoCeL?
- What do you think should be involved in SoCeL? Give me reasons.
- What kind of activities would you include or exclude as SoCeL activities? Students may choose from the following: informal learning/ interactions, social networking, using learning management systems (LMS), sharing ideas with colleagues online, chatting with lectures, On-line learning

Probe as required- Which SoCeL activities do you prefer? Why?

3. **Internet access and skills**

Internet access and skill is crucial in attaining SoCeL so it's important that you share your own experiences openly on this topic.

d) How long have you been using Internet and what is your major means of access? (Office, Internet Café, Personal device e.g. Desktop, Laptop, Tablet, or Mobile Phone)
e) What is the most reliable and preferred access means?
f) How many hours do you spend online per week?

Probe to ensure that the following are considered

- The major online activities engaged in
- Level of Internet usage skill (learner, skilled, or advanced)

4. **Current Teaching practices in your university**

We can now move on and talk about the current teaching practices that you engage in at your university.

d) What is the primary mode of learning of your courses (for example using Face-to-face, Online, or Blended)?

e) Do you often interact with your students in any way (face-to-face or online)?

f) Would you like to share your experience while you interact with your students? Especially the objectives and the nature of interactions:

    i. Sharing your own past experiences
    ii. Expressing you own opinions and facts
    iii. Demonstrate what you learning on your own
    iv. Discussing or reviewing past activities
    v. Solving current problems
    vi. Setting your goals and sharing them
    vii. Discussing assignments or class work
    viii. Engaging in other social activities
    ix. Passing time and leisure

5. **Online Social Networking**

I am interested in knowing your views on online social networking and how this may influence e-learning

g) Do you have any social networking presence (a personal social media profile)?
   If yes;

h) Which platforms do you use (Facebook, Twitter, LinkedIn, YouTube, Google+, etc.)

i) What do you use your social networking profile for? (e.g. Making friends, Chatting, Learning, Sharing information)

j) Have you ever used social media in any of the classes you teach and what has been your experience if you have ever used it?

k) What is your own opinion about using social media for educational purpose?

   If no;

l) What is the reason for not having?

Probe to ensure that the following are considered
    How social media may be effectively used to improve learning

6. **Leaning management technologies**

Finally, it is my belief that developers of LMS should listen to your opinion on the current technologies. From your point of view, what is the main message that developers of LMS should be aware of and what would you like to see in the future in relation to the next generation of learning management systems?

a) What learning management system (LMS) do you use in your university?

b) Would you like to share your experience on the use of these LMS platforms in regards to merits and demerits?

c) What is your opinion about adopting social collaborative learning technology in your teaching process using enhanced LMS?

d) Considering the current features of LMS you have, what do you expect to be done in order to improve the current learning process in your institution using this approach of social collaboration?

Thank you for your time and corporation

If you think of anything else, or have any queries, please contact me – details are on the information sheet provided.

Research Ethics Committee

University of Reading

Exploring Adoption of Social Collaborative e-Learning Technology in Higher Education

General interview guide for University Officials

Ethical consideration:

This is the study aimed at exploring adoption of social collaborative e-learning at a university level education. The interview is intended to establish your perspective on the use of social collaborative e-learning technology in your university. This (taking about 30 minutes) will be recorded with your permission in order to analyse at a later date. There are also other important considerations in the information sheet and consent form given to you. May I ask if you consent to this?

Introduction:

I would like you to tell me your views on how social collaborative e-learning is taking root at your university. However, I have some key issues that I hope we will go through during this interview, so I may have to check my prompts occasionally to make sure we are on track.

Definition: Social collaborative e-learning may be referred to as a pedagogical approach in which learning takes place via social interaction and collaboration using the Internet. This kind of learning is characterized by the informal sharing and construction of knowledge among participants using social networking technology and or enhanced learning management systems (LMS) as their primary means of communication or as a common resource

Questions:

1. **Education background information**

    Before we get into the main discussion, please tell me about your role in the university

    <u>Probe to ensure that the following are considered</u>

    - Your position
    - Influence of academic policy making
    - Number of years in the management

2. **Social collaborative e-learning**

To ensure that we at the same footing, let us start by you sharing with me your understanding of Social collaborative e-learning (SoCeL).

Probe to ensure that the following are considered

- Your definition/description of SoCeL?
- Whether or not there is any policy on e-learning
- How does the university regard informal learning/ interactions, social networking, using learning management systems (LMS); sharing ideas with colleagues online, chatting with lectures, On-line learning

3. **Internet service provision and access**

Internet service provision and access is crucial in attaining SoCeL so it's helpful if you discuss your policy and practice in this regard.

May need to probe to ensure that the following are considered

a) Policy on Internet service provision and access to students and lecturers
b) Availability of Internet connection

4. **Policy on teaching and learning**

We can now move on and talk about the current teaching and learning policies and practices at your university.

a) The primary mode of learning (Face-to-face, Online, or Blended)
b) Do you encourage online mode of delivery?
c) What would be the likely impact of adopting Online or Blended mode at your university

5. **Online Social Networking**

I am interested in knowing your views on online social networking and how this may influence e-learning

a) How does the university like to view the use of social media for official purposes (e.g. marketing, recruitment, academic etc.)?
b) Is there any policy to guide the use of social media for official purposes?
c) Do you consider social media applicable and necessary for academic purposes?
d) Do you encourage your students and lecturers to have social networking presence (personal social media profiles)?

6. **Leaning management technologies**

Finally, it is my belief that developers of LMS should listen to your opinion on the current technologies. From your point of view, what is the main message that developers of LMS should be aware of and what would you like to see in the future in relation to the next generation of learning management systems?

a) Most students and Lecturers think that the current LMS are boring. What do you say about this?
b) What is your opinion about adopting social collaborative learning technology in your learning process using enhanced LMS? Is it of any advantage, disadvantage or no new impact?

Thank you for your time and corporation

If you think of anything else, or have any queries, please contact me – details are on the information sheet provided.

Appendix D: Focus group guide

Research Ethics Committee

University of
Reading

Exploring Adoption of Social Collaborative e-Learning Technology in Higher Education

Focus Group Guide

Preamble:

  i. Welcome remarks from the facilitator
 ii. The purpose and context of the focus group
iii. What is focus group and how it will flow
 iv. Introduction of participants
  v. Questions
 vi. Closing remarks

Introduction:

The purpose of this research is to exploring adoption of Social Collaborative e-Learning technology at Makerere University and Uganda Christian University

Objectives:

This focus group is aimed at establishing the perspectives of participants on "*Adoption of Social Collaborative E-Learning Technology*" in their institutions. Specifically, it is intended to achieve the following objectives:

1. Determine whether or not **informal learning** can help scaffold formal educational goals

2. Establish views on educational affordances of social media and illustrate usefulness of **social networking** on educational attainment

3. Demonstrate the quality of **Learning management** systems (LMS) in respect to social collaborative e-learning

4. Broadly define the features of **social collaborative e-learning** systems suitable for higher education institutions

 Participants

The following participants will be selected on a criterion based sampling method considering that the study is based at Uganda Christian University and Makerere University.

Focus group A (Uganda Christian University)
- 7 Students (1 from each faculty)

- 3 Lecturers

Focus group B (Makerere University)
- 5 Students (all from College of Computing and Information Science)
- 2 Lecturers

Key attributes in participants
- Have attended a course delivered through face-to-face and online
- Have social media profile
- Have experience using learning management system (LMS)

Guiding Questions

Introductory question

What would be your description of e-learning environment?

May consider the terms:
- informal learning
- social networking and
- learning management system

Question 1

Can **informal learning**/interactions help support attainment of formal educational goals?

May need to prompt the issues:
- How informal learning occurs within your institutions
- What kind of interactions happen among students?
- How do students interact with lecturers?

Question 2

What collaborative activities are commonly performed during teaching and learning practices?

May need to prompt the issues:
- Group assignments
- Co teaching
- Class projects

Question 3

How can **social media** be useful for teaching and learning?

May need to prompt the issues:
- Social media profiles and how they are used
- How students and lecturers use social networking
- Any positive and negative experience in using social networking

Question 4

Is the current learning management system at your university useful is supporting teaching and learning?

May need to prompt the issues:
- What kind of learning management system is used?
- What are your views on Online, Face-to-Face and Blended learning approaches?
- Can you compare social networking sites (like Facebook) with learning management systems?
- Can social media features improve learning management systems?

Question 5

What would you say about **social collaborative e-learning?**

May need to prompt the issues:

Definition: Social collaborative e-learning may be referred to as a pedagogical approach in which learning takes place via social interaction and collaboration using the Internet. This kind of learning is characterized by the informal sharing and construction of knowledge among participants using social networking technology and or enhanced learning management systems (LMS) as their primary means of communication or as a common resource

- What is your view on the above definition?
- How is social collaborative e-learning being practiced in your institution?
- How would you build a social collaborative e-learning management system from scratch?
- What features would you have in a social collaborative e-learning management system?

Appendix E: Participant information sheet and consent form

Research Ethics Committee

University of Reading

Exploring the adoption of social collaborative e-learning in higher education: A study of two universities in Uganda

Project Description

Social collaborative e-learning has attracted great attention in higher education due to its great potential especially with the rapidly evolving social networking technological environment. In many institutions, lecturers and students are adopting the use of social networking sites to support learning process. Studies have however shown that efforts being made to integrate this technology in the learning process have not had definite success. This is attributed to lack of framework to guide the effective integration. This qualitative study will investigate participants' behaviours, perceptions, experiences and expectations on this emerging technology and it will be conducted through case studies and ethnographic approaches using mixed methods of survey questionnaires, focus groups, interviews and participant observation.

This is a doctoral research conducted by Francis Otto under the supervision of Professor Shirley Williams, School of Systems Engineering, University of Reading, UK.

Questionnaires, interviews, focus group discussions and observation will be employed to obtain data from participants (including students, lecturers and officials) from the universities who volunteer to take part in the research project. There are three stages of this project that will be sequential. In the first stage, questionnaires (taking about 15 minutes) will be filled either online or hard copy. The second stage will involve focus group discussions (taking about 1 hour) and interviews (taking about 30 minutes) which will be recorded with permission in order to analyse at a later date. The last stage will involve participant observation in which the researcher will spend some time with the participants in order understand how they go about with social networking technology in their learning process.

Participation in this research is voluntary and withdrawal can be made at any stage. Personal details of the participants will only be kept as necessary by the researcher and used to ensure compatibility of the samples and will not form part of any disseminated information. Information obtained will only be used for academic research purpose and any publications stemming from it. All information provided will be kept strictly confidential. The storage and disposal of the collected information provided will be handled according to the University procedures.

The results of this study could be made available to interested parties using electronic format.

This project has been subject to ethical review, according to the procedures specified by the University Research Ethics Committee, and has been given a favourable ethical opinion for conduct.

Shirley Williams

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Research Ethics Committee

University of Reading

Consent Form

1. I have read and had explained to me by …………………………………………….. the accompanying Information Sheet relating to the project on *Exploring the adoption of social collaborative e-learning in higher education: A study of two universities in Uganda*

2. I have had explained to me the purposes of the project and what will be required of me, and any questions I have had have been answered to my satisfaction. I agree to the arrangements described in the Information Sheet in so far as they relate to my participation.

3. I understand that participation is entirely voluntary and that I have the right to withdraw from the project any time, and that this will be without detriment.

4. This application has been reviewed by the University Research Ethics Committee and has been given a favourable ethical opinion for conduct.

5. I have received a copy of this Consent Form and of the accompanying Information Sheet.

Name: ………………………………………………………………………………………

Date of birth: …………………………………………………………………………

Signed: …………………………………………...………………………………

Date: …………………………………………………………...………………………

Appendix F: Solicitation for participation

Research Ethics Committee

Invitation for participation

Dear Sir/Madam,

Exploring the adoption of social collaborative e-learning in higher education: A study of two universities in Uganda

We are conducting a research on the adoption of social collaborative e-learning in Makerere University and Uganda Christian University. Participants in this research are students, lecturers and officials of these universities. This is a doctoral research under the supervision of Professor Shirley Williams, School of systems Engineering, University of Reading, UK where the researcher, Francis Otto, is a PhD student. The research aims to examine the views of students, lecturers and leaders of these institutions regarding the uptake of social collaborative e-learning technology. The result of which may be used to develop a framework to guide the effective integration of social collaborative e-learning environment within the higher education system.

As you are aware, in many institutions, lecturers and students are adopting the use of social networking sites to support the learning process. Studies have however shown that efforts being made to integrate this technology in the learning process have not had definite success. This is attributed to lack of framework to guide the effective integration.

Mixed methods of survey questionnaires, focus groups, interviews and participant observation will be used to conduct this research. Participants will be asked to describe their views on adoption of social collaborative e-learning technology.

These approaches will lead to deeper understanding and analysis and the knowledge gained will be used to develop a framework that will act as a guideline for the educational policy makers, institution leaders, and technology developers in planning and integrating social collaborative e-learning environment within the higher education systems especially from the developing countries' perspective. Link to the online questionnaire is provided here: For lecturers goo.gl/EmmrGI

For students goo.gl/sbyJAJ

We would also like to invite you participate in the focus group discussion or to be interviewed so we can find more information your perspective of the social collaborative e-learning in your institution. If you wish to be involved in the any of these activities or in case you would like to get further clarification or details about the project, please contact us through f.otto@pgr.reading.ac.uk or Shirley.williams@readning.ac.uk.

Thank you in advance and best regards