Social Networking Sites and the Edu-Social Experience
in Higher Education Institutions

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by

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DECLARATION

This Work has not previously been accepted in substance for any degree and is not being concurrently submitted in candidature for any degree.

Date ....16/5/2019...

STATEMENT 1

This thesis is the result of my own investigations, except where otherwise stated. Where correction services have been used, the extent and nature of the correction is clearly marked in a footnote(s).

Other sources are acknowledged by footnotes giving explicit references. A bibliography is appended.

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STATEMENT 2

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Acknowledgements

Abstract

Social Networking Sites are becoming an integral part of modern educational activities. Therefore, this research aims to comprehensively investigate how the usage of SNSs affects the educational and social experience of students and educators in higher education. The study also explores opportunities and challenges facing SNS as an educational tool, and aims to bridge a technology-based factor, i.e., SNS, with social factors, across an educational theoretical framework. The research intends to answer three research questions: (1) How do faculty and students view and use SNS in higher education institutions? (2) How does using SNS in higher education institutions affect the educational and social experience? (3) What are the opportunities and challenges facing SNS, as a learning tool, in higher education institutions?

The study is based on the theoretical foundations of the Community of Inquiry (CoI) framework that was developed by Garrison et al. (2000) as an instructional design model for e-learning. Its purpose is to provide a framework for the use of computer-mediated communication in supporting educational experience. The CoI is defined as the intersection of social, cognitive, and teaching presences, and was adopted in this research to conceptualise educational experience.

A case study strategy is employed, and mixed data collection and analysis methods were conducted over four consecutive stages. First, a web application was developed to extract the interaction that is taking place on the CMT Facebook group. The application is designed to help in classifying and analysing the extracted data using content analysis techniques. Second, findings of the content analysis helped in devising structured questionnaires that were used to survey 525 students. This data was analysed through descriptive statistics, correlation and regression models. Third, semi-structured interviews were conducted with 21 faculty members at CMT. Finally, five focus groups with 30 CMT students were conducted.

The data obtained from online interaction and questionnaires was triangulated with the data gathered from interviews and focus groups. Results show that Facebook is extensively used as a non-formal learning tool for various college-related activities. Findings indicate that Facebook substantially satisfies social and teaching dimensions of the educational experience, but despite this, its use as a platform that supports intellectual discussions proved to be insufficient. The study shows interesting results, such as the appearance of implicit types of interaction, and how the nature of different courses affects its compatibility to be taught using Facebook affordances. Moreover, some issues related to students' and faculty members' privacy emerged as concerns for using Facebook in higher education. The study concludes with contributions to knowledge and to practice, and finally, recommendations were proposed to effectively use SNS in parallel with traditional learning management systems.

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List of Acronyms

Acronym	Term
AAST	Arab Academy for Science and Technology
API	Application Programming Interface
AVE	Average Variance Extracted
BIS	Business Information Systems
CA	Content Analysis
CMC	Computer-Mediated Communication
CMS	Content Management System
CMT	College of Management and Technology
CoI	Communities of Inquiry
CoP	Communities of Practice
CP	Cognitive Presence
CSCL	Computer Supported Collaborative Learning
F2F	Face to Face
FB	Facebook
FBUI	Facebook Usage Intensity
GTA	Graduate Teaching Assistant
HE	Higher Education
ILO	Intended Learning Outcome
MAU	Monthly Active Users
PSSM	Psychological Sense of School Membership
RO	Research Objective
RQ	Research Question
SBAI	Sense of Belonging to Academic Institution
SC	Sense of Connectedness
SM	Social Media
SNS	Social Networking Sites

Acronym	Term
SP	Social Presence
SU	Student Union
SUG	Student Union Group
TA	Teaching Assistant
TLA	Teaching and Learning Activities
TP	Teaching Presence
UGC	User-Generated Content

Chapter 1- Introduction

Chapter 1 provides an introduction and presents the context of the thesis. It describes the underpinning of the thesis and motivation behind the research by presenting and discussing the research aim and objectives and research problems. Moreover, it presents the study's main academic and practical implications, and finally, it presents the rationale behind the structure of the thesis.

1.1 Research Background

Social Networking Sites (SNSs) are increasingly gaining importance in today's Internet-orientated society, and are known to play a vital role in collaboration and community building. One important characteristic of commonly used SNS is that they use mobile and Internet-based technologies to act as very interactive platforms through which both individuals and communities can share, and modify user-generated content (UGC) (Kietzmann et al., 2011).

A number of studies have shown how social software applications can positively contribute to a wide range of teaching and learning practices (Manca and Ranieri, 2016a; Schroeder et al., 2010). SNSs enable new forms of community-based collaborative learning by providing a platform for interaction (McLoughlin and Lee, 2010).

SNSs are very prevalent and commonly used by younger members of society in the educational context (Junco, 2012), since they allow students to share knowledge, discuss topics, and help other students with their questions and enquiries (Selwyn, 2009). On the other hand, SNSs are very beneficial for educators as well, as they help them communicate with their students easily (Manca and Ranieri, 2016). Educators may use SNS as a forum or a blog, with options for easily networking and reaching out to their students (Duncan and Barczyk, 2013).

SNSs can improve students' participation and make them feel more connected to their colleagues. As indicated by Duncan and Barczyk (2013), SNSs play a role in facilitating knowledge sharing and interaction among students, as well as enhancing collaboration and other learner-centred activities. Normally, students would feel the need to get together, have discussions, collaborate, and exchange information with others who share the same interests (Eteokleous et al., 2012). Therefore, SNS act as a significant tool for accomplishing these social and educational needs.

The overall aim of the research presented in this thesis is to comprehensively investigate how using SNS, as an integrated part of educational activities, affects the educational and social experience of students and educators in higher education. Moreover, the study seeks to explore opportunities and challenges facing SNS as an educational tool. The research aims to bridge a technology-based factor, i.e., SNS, with social factors, across an educational theoretical framework.

1.2   Research Aim and Problem Definition

The evolution of technology plays an essential role in the modern development of education (Mozhaeva et al., 2014a). Many recent studies have explored the non-negligible role that social software and social networking sites (SNS) play in higher education.

Some studies have investigated the student's perspective, while others have considered the instructor's perspective, as discussed in Chapter 2. Moreover, studies in the literature are mainly concerned with the effect of SNS usage on specific variables such as academic performance, student satisfaction and student engagement (Dyson et al., 2015; Junco, 2015a; Lambić, 2016a; Powless, 2011); no previous work has covered a holistic investigation of the overall educational experience that occurs on SNS.

Hence, the work in this thesis covers a comprehensive investigation of the educational experience occurring on SNS in higher education from the perspective of the main stakeholders, namely students and faculty.

Despite its vast educational potential, the role of SNS usage, as part of educational practices and learning activities, still requires further exploration (Lau, 2017; Manca and Ranieri, 2016a; Menzies et al., 2017). The reason behind this is the lack of comprehensive empirical studies that try to understand the effect of using an SNS, such as Facebook, on the overall educational dimensions through an educational framework or model. Moreover, since Facebook is first and foremost a social tool, education-related social dimensions are also worth exploring and linking with the overall educational experience. No previous studies have yet reported how the intensive use of Facebook affects the educational experience of higher education students. The Facebook Usage Intensity (FBUI) is an

important factor that measures users' emotional connectedness and engagement with the use of Facebook (Ellison et al., 2007).

FBUI is considered superior in comparison to traditional standards of frequency of use, time spent or duration of service uses, as it takes into account the richness of the user experience delivered by the usage of Facebook (Valenzuela et al., 2009).

In order to capture the various dimensions of the educational experience, the Communities of Inquiry (CoI) framework represents the most eligible educational framework, since it measures the three presences that occur through computer mediated discussions in the educational context, namely the teaching, social, and cognitive presences (Garrison et al., 2000). It is essential for academics and practitioners to understand the empirical connections between Facebook usage intensity and the educational experience represented by the three CoI presences.

This investigation will enable academics to understand the effect that Facebook usage intensity has on the teaching, social, and cognitive dimensions of the educational experience in higher education. Moreover, perspectives of both students and instructors are investigated to ensure a comprehensive understanding of the context. The study will also help better understand the educational potential of using Facebook as an effective learning tool in higher education.

Furthermore, investigating aspects such as the sense of belonging to the academic institution and sense of connectedness between students will help shed light on further social dimensions that are present in the educational context.

An initial review of relevant literature showed interesting dimensions that are yet to be explored, and a potential for covering an existing gap that could help this study contribute both to theory and practice. The research aims to bridge a technology-based factor with social factors, across an educational theoretical framework.

1.3 Research Questions

This study aims to explore the role that social networking sites, as a communication technology, play in the social and overall educational experience of both students and faculty in higher education. Moreover, the study will explore both the opportunities and challenges that SNSs face as learning tools in higher education.

Furthermore, the study intends to comprehensively explore the nature of activities that take place virtually on SNS in general and FB specifically, in the context of higher education.

The research questions evolved during the investigation as various research angles unfolded and seemed worth studying. Figure 1.1 presents the research questions that are investigated throughout the study.

Answering the research questions in Figure 1.1 should help the researcher understand and more effectively propose a model for the effect of using SNS on the overall educational and social experience.

> **RQ1:**
>
> **How do faculty and students view and use SNS in higher education institutions?**

> **RQ2:**
>
> **How does using SNS affect the educational and social experience in higher education institutions?**

> **RQ3:**
>
> **What are the opportunities and challenges facing SNS, as a learning tool, in higher education institutions?**

Figure 1.1: Study Research Questions

The contribution to knowledge shown in this PhD Thesis will come from the development of a holistic investigation and analysis of SNS usage and its adoption in higher education institutions. The study of Facebook usage intensity and how it affects the educational experience, conceptualised by the CoI framework, has not been directly associated in previous studies. Furthermore, the relationship between the sense of belonging to an academic institution and Facebook usage intensity that is being tested in this study is not present in any previous relevant literature.

1.4 Research Objectives

The thesis' aim is reached through attaining the following different but closely related objectives:

1. Develop a critical review of relevant literature on SNS and their usage in higher education, computer-mediated educational experience, and relevant e-learning and social theories.

2. Explore how students and faculty use SNS in educational activities.

3. Investigate how SNS usage affects social and educational experience dimensions.

4. Make recommendations for efficiently integrating SNS in the educational experience.

1.5   Contribution to Knowledge

Previous studies show that dependence on technology by all higher education stakeholders is increasing, and as a result, its usage in education is increasing (Heiberger & Harper, 2008). A large part of this technology increase is through SNS usage. Because of this technology emergence trend, examining the nature of social networking site usage by students is a useful beginning. This study sheds light on how Facebook is used by undergraduate students and how this impacts the educational experience. It also looks at how Facebook usage impacts students' sense of belonging to their college or university and connectedness with other students. In addition, it allows for inferences to be made about today's modern college environment with respect to technology. Findings of this study could impact how higher education institutions invest their resources with respect to technology use in the educational setting. The study also contributes to the detailed understanding of the relationship between Facebook usage and the three presences of the CoI model from a novel perspective. It identifies how involved students are with Facebook, as well as measuring the strength of the relationship between Facebook usage intensity and the overall educational experience. This study also explores how connected students feel to their college or university and whether Facebook usage impacts the sense of belonging to their academic institution. In addition, the students' sense of belonging to their academic institution is also explored.

Review of the existing literature revealed a gap in the knowledge relative to the holistic investigation of all factors mentioned above, as illustrated by the Venn diagram shown in Figure 1.2.
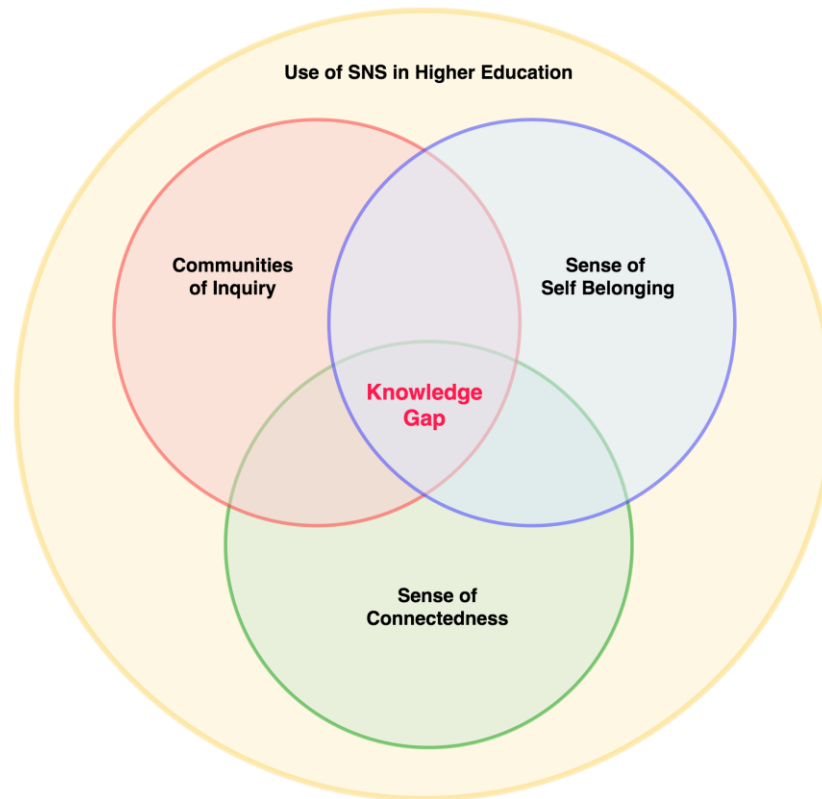
Figure 1.2 Knowledge gap derived from literature review

The study also contributes to the detailed understanding of the relationship between Facebook usage intensity and the three presences of the CoI model from a holistic perspective. It identifies how involved students are with Facebook, as well as measuring the strength of the relationship between Facebook usage intensity and the overall educational experience.

Furthermore, the study also explores how connected students feel to their college or university and whether Facebook usage impacts the sense of belonging to their academic institution. In addition, the educational experience is also investigated from a mediator perspective, between Facebook usage, and social connectedness and sense of belonging respectively.

The research contributes to theory by bridging a technology-based factor, such as Facebook usage, with social and psychological factors, namely the sense of connectedness and sense of belonging, across an educational theoretical framework, namely the Communities of Inquiry framework.

1.6   Practical Contribution

The study contributes to practice by providing recommendations for higher education professionals, as well as faculty members and teaching staff at academic institutions, on how to effectively utilise Facebook and its affordances as a learning tool to append traditional educational activities.

Furthermore, findings from this study could impact how a college or university should invest its financial and human resources with respect to technology use in the college environment. In order to effectively benefit from the capabilities of LMSs and SNSs, a hybrid suggestion of using both of them in parallel to make use of their distinct features is proposed.

Findings of the study can be utilised by the broad community of online and blended education researchers, practitioners, administrators, as well as instructional designers.

1.7 Research Design

This study follows a mixed-methods approach as per Creswell and Plano Clark (2007) in that the research involved "collecting, analysing, and mixing both quantitative and qualitative data in a single study or series of studies" (p. 5). Mixing of data sources and types rather than relying on one type can provide a more detailed description of the situation being studied, and offer countering advantages to offset any weaknesses inherent in each of the individual methodologies (Creswell and Plano Clark, 2007). Johnson and Onwuegbuzie (2004) assert that mixed-method designs for empirical research support a methodological pluralism that may result in outcomes superior to those obtained via mono-method research.

The case study employed in this research will use CMT AAST as the higher education institution setting, and its students and faculty members as the main participant groups; and Facebook as the SNS subject of study.

The study starts by capturing and analysing the interaction taking place among students and faculty members, in closed Facebook groups created and moderated by CMT faculty members as official means of communication between the college and enrolled students. Content analysis techniques are applied through a web tool specially designed and developed by the researcher.

The results of the content analysis helped in developing structured questionnaires to be distributed on a sample of CMT students. A total of 525 questionnaires were filled out by students, returned and analysed.

Twenty-one semi-structured interviews with faculty members were later conducted and the data obtained from the questionnaires was triangulated with the data gathered from interviews to draw conclusions and recommendations.

This mixed methods study was intended to serve research participants and stakeholders of higher education institutions. The mixed methods research design used in this study combined a variety of methods to gather and analyse data from participants and the interaction taking place on Facebook groups. Multiple data sources, including observation, a survey, interviews, and focus groups were used to answer the research questions. The data collection methods focused primarily on the participant perceptions of using the social networking tools in coursework and educational activities. The data was analysed for salient themes. In later chapters these themes are interpreted by using key theoretical frameworks based on the relationship to the research questions and purpose.

This mixed methods study included a combination of descriptive qualitative as well as quantitative data, conveying a complex, diverse, and multidimensional experience that generated further understanding and insight into the study domain. Moreover, the current study sheds light on the educational role of social networking sites in higher education.

A discussion of possible implications is included as part of the recommendations in Chapter 7.

1.8 Structure of the Thesis

The current chapter acts as an introduction that defines the problem and explains the aim and objectives of the study, then will be followed by the chapters shown in Figure 1.3 which illustrates the thesis structure.

Chapter 2 is a review of the background material related to SNS in relation to higher education. The chapter will also include a focus on studies of Facebook usage in higher education, Communities of Inquiry and their presences, sense of self-belonging and sense of connectedness.

Chapter 3 will provide an explanation of the research philosophy, design methods, data collection and analysis techniques, population and sampling procedures. Moreover, it focuses on the four different stages of the study and the mixed methods for data collection and analysis used in each phase respectively.

Chapter 4 will include the analysis of the first stage of data analysis, namely the content analysis of the Facebook interaction.

Chapter 5 will present the second stage of the study, namely the quantitative analysis of the data collected by the student survey.

Chapter 6 will present the analysis and the findings of qualitative data collected through the third and fourth stage of data collection, namely from faculty interviews undertaken and students' focus group discussions.
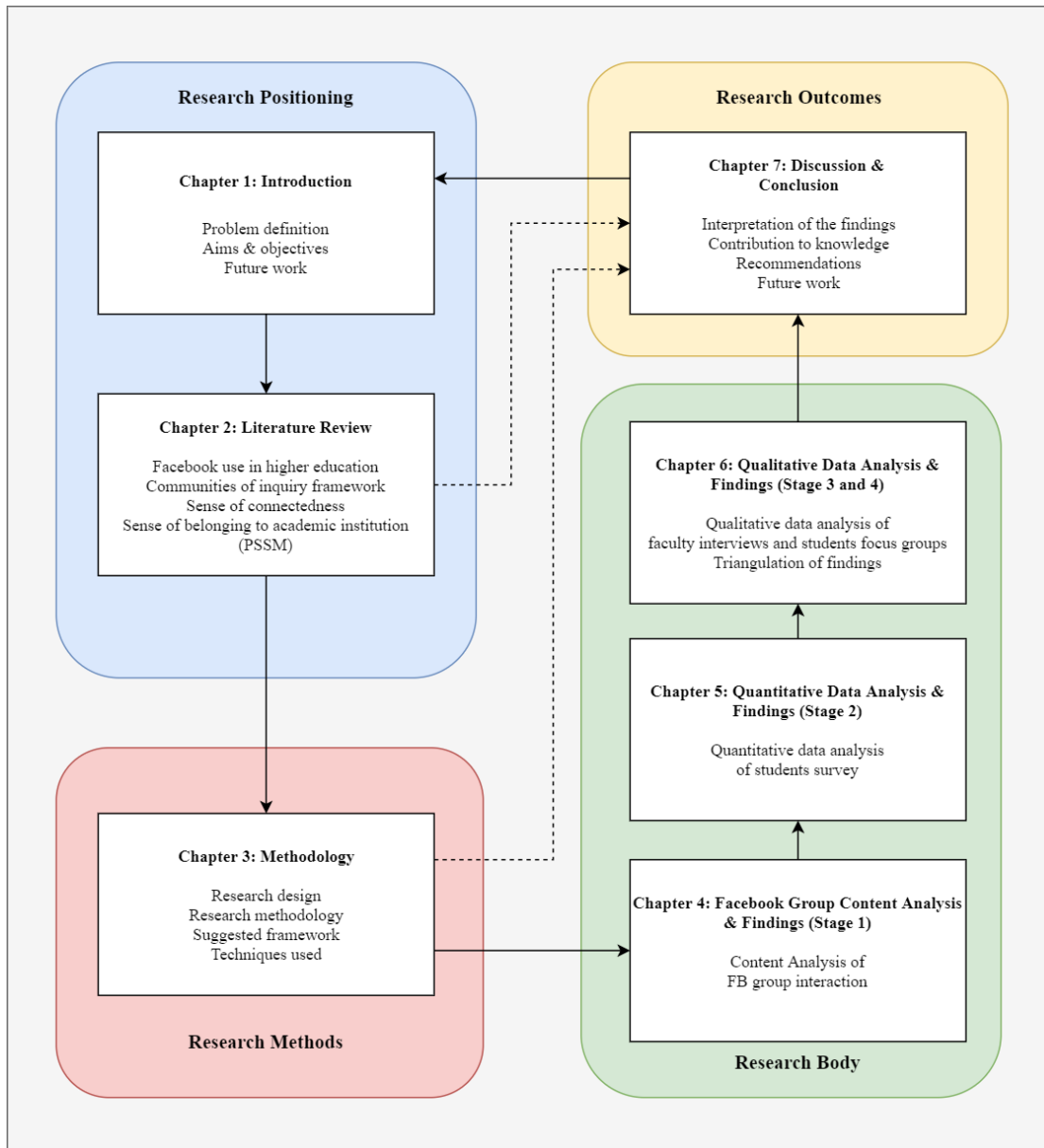
Figure 1.3 Thesis Structure and overall research process

Chapter 7 will sum up the conclusions by discussing triangulated results and making suggestions for further research, as well as emphasising the contribution of the study at hand to both literature and practice. Additionally, the chapter outlines the research limitations and proposes directions for future work.

Chapter 2 – Literature Review

This chapter will present the systematic review of literature related to the research questions and objectives previously listed in Chapter 1. The chapter extensively explores relevant previous work related to usage of social networking sites (SNS) in higher education by both students and faculty members. Moreover, literature related to e-learning theories and models, capturing educational experiences while learning using the mediation of technology, is also presented and discussed. Finally, the chapter explores social dimensions related to SNS usage in education.

2.1 Introduction

Kaplan and Haenlein (2010) defined social media as applications supported by Web 2.0 technologies through which users can create and share information as well as collaborate with other users. Social media are classified into a) social networking sites (SNS), such as Facebook, that support information sharing and connecting users, b) creativity work sharing sites, such as YouTube and Flickr, c) collaborative sites such as Wikipedia, and finally d) micro blogging sites such as Twitter (Chu and Kim, 2011, p. 48). Due to the typology above and different conceptualisations of social media, researchers suggest that targeting distinct social media websites may help improve the development and execution of strategies to influence, interact, and engage with students (Finamore et al., 2012). Therefore, this literature review focuses on social networking sites, specifically Facebook, to explore its role in higher education institutions.

2.2   SNS Usage in Higher Education

The term "Social Networking Sites" (SNS) refers to a wide range of applications that enable users to create, share, comment on, and discuss digital content (Moghavvemi et al., 2018). SNSs are considered interactive, dynamic, people-centric, and social (Manca and Ranieri, 2016). Moghavvemi et al. (2018) claim that one of the aspects often overlooked about SNS is its ability to transform learning and teaching into a more open, social, and collaboration-orientated experience.

SNSs can be further described as virtual spaces where people with similar interests meet to share ideas, information, photos, and communicate with one another (Mao, 2014). By offering multiple means of communication, as well as access to the shared personal information of others, SNSs have attracted a large number of secondary and college students (Selwyn and Stirling, 2016).

The significant daily use of SNSs by students of different ages reveals that SNSs have a great potential to be applied in education (Manasijević et al., 2016a). According to Dyson et al. (2015), SNSs have many desirable qualities of good educational technologies, as they can enable peer communication and can adapt to the social context of learning in particular schools and universities. Furthermore, SNSs can be used in education to support communication among students, information gathering and participation in collaborative learning networks that are based on common interests and similarities (Kitsantas et al., 2016). SNSs have been shown to have a positive impact on collaborative learning (Al-Rahmi et al., 2014). Students are willing to invest their time and energy in SNSs such as Facebook, in order to connect with those who share their interests and act as part of their

educational community (Al-Rahmi et al., 2014). Even though learning was not the main reason for joining these communities, 89% of respondents in a study by Clough (2010) believe that informal learning is an essential outcome of their participation in the SNS community. Social networking offers the opportunity for students to engage in their education and learning through promoting critical thinking, which is in turn considered one of the traditional goals of education (Bugeja, 2006). SNSs allow students to engage in the educational process by having an active role, instead of just being passive observers (Kitsantas et al., 2016). There is no doubt that in order to use SNSs as effective learning tools, complex effort needs to be exerted in structuring courses and interacting with students (Mao, 2014).

According to Junco (2015a), about 87% of college students log onto Facebook every day, as it acts as an important social domain and communication medium. Facebook has the potential to be used in teaching and learning due to its popularity and features that provide social and technological advantages that could be used in education (Wang et al., 2012). Students use Facebook to share their experience with their university and to exchange practical and academic information (Selwyn, 2009). Moreover, unlike official LMS websites, Facebook enables higher interaction levels and acts as an informal communication channel (Mazer et al., 2006). Students generally have a positive response to the use of Facebook for education purposes (Gupta and Irwin, 2016). In a study by Manca and Ranieri (2013), a large number of students agreed that Facebook could be used as a supporting teaching and learning tool. Facebook offers a different method of exchange for students who are actively using Facebook with their peers and friends in the same course (Selwyn, 2009). Students who use Facebook for educational purposes have a

number of benefits, such as finding learning material, helping each other answer course-related questions, as well as connecting with other students and interacting with instructors (Ainin et al., 2015).

Table 2.1 Factors studied in previous work on FB usage in HE

Stakeholder	Perspective	Factor	Author
Students	Educational	Educational usage of FB	Sapargaliyev, 2014; Wang et al., 2014; Friedman and Friedman, 2013; Kirschner, 2015; Hamid et al., 2015
		E-learning Communities	Al-Rahmi and Zeki, 2016; Menzies et al., 2017; Manasijević et al., 2016b; Kirschner, 2015; Clough, 2010; Dabbagh et al., 2015; Lambić, 2016b; Mao, 2014; Greenhow and Lewin, 2016
		Knowledge management	Wang et al., 2014; Rambe, 2012
		Perceived usefulness	Lambić, 2016b; Sharma et al., 2016
		Academic performance	Alwagait et al., 2015; Lambić, 2016b; Al-Tarawneh, 2014; Gurcan, 2015
		LMS	Dogoriti et al., 2014; Eger, 2015; Labus et al., 2015; Meishar-Tal et al., 2012; Mozhaeva et al., 2014b; Petrovic et al., 2014; Wang et al., 2014; Sapargaliyev, 2014
		Communication	Waiyahong, 2014
		Social influence	Sharma et al., 2016; Sapargaliyev, 2014
	Social	Collaboration	Sharma et al., 2016; Dabbagh and Kitsantas, 2012
		Engagement	Finamore et al., 2012; Tarantino et al., 2014; Mbodila et al., 2014; Junco, 2012
		Student satisfaction	Powless, 2011; Imlawi et al., 2015; Ellison et al., 2007
		Privacy	Dabbagh and Kitsantas, 2012; Tinti-kane et al., 2013
		Student to student relationship	Hamid et al., 2015
		Student to lecturer relationship	Hamid et al., 2015
		Digital cultures	Greenhow and Lewin, 2016
		FB as third space	Aaen and Dalsgaard, 2016
		Frequency of usage	Junco, 2012; Waiyahong, 2014
	Other	Social Media readiness	Cao et al., 2013
		Social engagement	Snyder and Navarro, 2015
Faculty/ Teachers	Educational	Communication/Interaction	Sarapin and Morris, 2015; Akçayır, 2017
	Social	Connectedness	Sarapin and Morris, 2015
		Improper use of FB	Bugeja, 2006
		Digital cultures	Greenhow and Lewin, 2016

After reviewing literature journal articles exploring SNS in higher education, Table 2.1 was created to summarise the main dimensions investigated in previous studies. Dimensions are classified according to the stakeholders of the studies (student, faculty, both, and other) and the perspective of the dimension, whether educational, social, or other.

There are a number of benefits related to students' use of Facebook for educational purposes, such as identifying and finding learning material, helping friends answer questions, connecting with others to discuss projects, sharing lecture and study notes, receiving notifications regarding their course and increasing interaction with other students and instructors (Al-Rahmi et al., 2014; Gupta and Irwin, 2016; Kitsantas et al., 2016; Manca and Ranieri, 2016a). Furthermore, Facebook's usage for collecting and sharing information among students is positively related to students' academic performance (Junco, 2012b).

A SWOT analysis developed by Schroeder et al. (2010) reports findings from a study conducted with staff and students involved in educational initiatives using social software (e.g. SNS, wikis, blogs etc.) The study aimed to explore the benefits and potential shortcomings of using social software in an educational setting. The study's findings were presented in the form of a SWOT analysis that identified the strengths, weaknesses, opportunities and threats of using social software in higher education.

Strengths of social software included i) "building social relationships", particularly where students are geographically isolated; ii) "improved learning" where critical analysis and promotion of independent learning is encouraged; and iii) "enhancing staff-student

communication" where staff are more present to perceive difficulties faced by students, and the high degree of interaction in a more informal setting (Schroeder et al., 2010).

According to Schroeder et al. (2010), the external opportunities that are provided by SNS are i) "showcasing work to public" where students could create public content to show their skills, which leads to enhancing their employability; and ii) "creating and maintaining communities" where communities and social networks created via the SNS persist beyond the teaching period. E-learning communities in particular were discussed in multiple studies as shown in Table 2.

Furthermore, Ozturk (2015) found that many studies stated that Facebook is considered an effective environment for discussion when it comes to the online dimension of blended learning (Mazer et al., 2007; English & Duncan-Howell, 2008). These studies revealed that Facebook is able to facilitate communication and cooperation, and has a positive impact on the social dimension and community.

Students prefer Facebook over traditional LMSs as a supplementary learning tool because it enables them to get more acquainted with their classmates, share information more efficiently, feel like valued participants, and eventually learn more (Duncan & Barczyk, 2013).

As per Table 2.1, many studies have suggested that Facebook can have a significant effect on student performance (Junco, 2015; Kirschner & Karpinski, 2010; Tess, 2013). The interface is considered more user-friendly compared to "educationally-approved" LMSs, has a massive number of worldwide users, and offers many affordances and features. Moreover, Facebook is easily available to both students and instructors, which could

positively affect the teaching and learning process (Kazanidis et al., 2018). Facebook reduces the risk of "technological frustration", which very often negatively affects the success of online learning (Ali et al., 2018; Manca and Ranieri, 2013).

Ozturk (2015) revealed that students have a positive perception about instructors using Facebook, which increases their motivation by boosting the instructor-student relationship, as well as having a positive impact on learning and the course atmosphere. However, the number of studies with an effective theoretical and educational basis for evaluating the learning dimensions taking place on social network sites is very limited (Aghili et al., 2014; Ozturk, 2015).

Schroeder & Greenbowe (2009) revealed that for discussion, students prefer using Facebook more than other forum platforms, even if using them was made mandatory by their institution. Moreover, besides using it more frequently, discourse happening on Facebook generated more detailed answers to advanced discussion topics (Schroeder & Greenbowe, 2009). Schroeder and Greenbowe (2009) highlighted that the frequency of use and time students spend on Facebook is a possible justification for this phenomenon.

2.2.1   Facebook Usage Intensity

One of the variables used in research conducted on the use of Facebook in education is the frequency and duration of Facebook use. Frequency and duration of SNS use have been measured in research on involvement in student activities (Kirschner, 2015; Sarapin and Morris, 2015) and time spent studying (Junco, 2012).

Table 2.2 Facebook Intensity Scale used in previous Higher Education Studies

Author/Title	Method	Findings
Ellison et al., 2007/ The benefits of Facebook "friends:" Social capital and college students' use of online social network sites	Regression analyses conducted on results from a survey of undergraduate students (N = 286)	Results suggest a strong association between use of Facebook and the three types of social capital, with the strongest relationship being to bridging social capital. In addition, Facebook usage was found to interact with measures of psychological well-being, suggesting that it might provide greater benefits for users experiencing low self-esteem and low life satisfaction.
Lampe et al., 2011/ Student use of Facebook for organising collaborative classroom activities	Data from two surveys (N=302, N=214) are used to analyse how Facebook use, social and psychological factors, self-efficacy, and types of instructor-student communication on Facebook are related to positive and negative collaboration among students.	Predictors of Facebook use for class organising behaviours include self-efficacy and perceived motivation to communicate with others using the site. When placed in the context of social and psychological factors, Facebook intensity did not predict either positive or negative collaboration, suggesting that how students used the site, rather than how often they used the tool or how important they felt it was, affected their propensity to collaborate.
Michael, 2013/ College Student Social Networking and its Relationship to Perceived Social Support	The research strategy involved the administration of an online survey to over 150 students, age 18 through 22. The instruments used in the study were the Facebook Intensity Scale (FIS), the Multidimensional Scale of Perceived Social Support (MSPSS), and the Psychological Sense of School Membership (PSSM) scales, along with items examining students' demographic characteristics, Internet use history, and items intended to supplement the FIS by determining different interactive experiences of students with peers and friends	When controlled by demographic and Internet use history variables, several of these items were significant. This study demonstrates the importance of examining the online behaviours of today's college students, and of continuing to investigate the domains and outcomes that are related to use of sites such as Facebook.
Hill, 2015/ An investigation of the connections between use of Facebook and the self-esteem/well-being of students with disabilities in the university of Iowa reach program.	Quantitative study was to explore the relationship between disability, Facebook usage and the self-esteem/well-being of University of Iowa (UI) REACH students. Participants included students with a documented disability (n=56) currently or formerly enrolled in the UI REACH program	Results of the descriptive correlational analysis, Analysis of Variance (ANOVA) and the linear regression found one major and one supplemental finding. First, the results indicated that there was not a significant relationship between the number of Facebook friends UI REACH students had and their reported level of self-esteem. Second, the results of the study indicated that UI REACH students who spent more time on Facebook reported lower self-esteem. Hence, this result was found to be significant.
Shaltry, 2016/ Pre-service teachers' development of bridging and bonding social capital: Influences of their formal and informal online social network site use in courses	The research used an online survey, which was sent to juniors, seniors and interns in a college of education to gather data about pre-service teachers' self-reported frequency and purpose of use of social network sites. Analysis included an examination of the survey data using quantitative methods, a comparison of current data to that collected by Ellison et al. in a similar 2007 study and qualitative analysis of responses to open-ended questions about experience with the social network site Facebook.	Bonding social capital and bridging social capital were positively correlated, as were attitudes toward formal Facebook use and informal Facebook use. The relationships of measures of social capital with Facebook intensity were weak. The students' reports of formal Facebook use by their teacher education instructors and informal use among themselves provided further insight into how the context of social network sites use may influence the development of social capital.

Ellison et al. (2007) developed the Facebook Intensity Scale (FIS) to measure social capital among college students who use Facebook. The Facebook Intensity Scale includes questions on the duration and frequency of FB usage, number of FB friends, how students feel about using FB, and the extent to which students are actively engaged in using FB. FIS was used in multiple studies to evaluate and measure the intensity of using Facebook (Hill, 2015; Lampe et al., 2011; Michael, 2013; Shaltry, 2016). Table 2.2 summarises the previous relevant studies that have used the FIS to measure the intensity of Facebook usage by students in the context of higher education.

2.2.2   SNS Educational Affordances

Previous studies have acknowledged and considered the use of SNSs as a medium for effectively building connections between learners and instructors (Cheung et al., 2011; Greenhow and Lewin, 2016). Rambe (2012) claims that SNSs and their affordances facilitate collaborative knowledge sharing among group members; this aids development of communication skills and allows students to engage in productive reasoning and creative thinking processes (Al-Samarraie and Saeed, 2018).

Smith (2016) defines the term 'affordance' as follows: "An affordance can be understood as a characteristic allowing one to carry out possible (inter)actions via an object or within an environment (physical or virtual); for example, an on-screen button that the user can click or press when using a mouse, track pad, or touchscreen, whereby the button affords clicking (Hayman & Smith, 2015). In connecting emerging technologies to educational practice, Willcockson and Phelps (2010) define an affordance as the way a technology or software can be used and what it allows the user to do or not to do" (Smith, 2016, p. 45).

Al-Samarraie and Saeed (2018) found that Facebook, Twitter, Skype, and WhatsApp are the most frequently used tools for collaborative learning purposes and for aiding collaborative sessions. Kirchner and Razmerita (2015) stated that using Facebook and LMS tools together would increase students' satisfaction. Additionally, the combination of SNS affordances and functionalities may significantly support interaction between group members (Kurtz, 2014). SNS affordance for sharing resources can help students effectively exchange their views and knowledge, which will lead to engagement in active learning (Al-Rahmi et al., 2014). Moreover, Lampe et al. (2011) revealed that SNS affordances help stimulate discussion and resource sharing among students. Furthermore, SNSs allow users to view, like, comment on, share and exchange ideas, which leads to collaboration between team members (Mbodila et al., 2014). Sockett & Toffoli (2012) indicate that Facebook affordances facilitate participation and enable students to engage in discussions and communicate their concerns about course content with other members of the group. Facebook facilitates the achievement of familiarity between group members and helps them establish an increased level of trust (Charlton, Devlin, & Drummond, 2009), that is substantial for the "collaborative knowledge building" process. Moreover, Barczyk and Duncan (2013) discussed the potential of Facebook affordances such as groups, files and slides sharing, and questions in providing an effective information-sharing instrument that facilitates dialogue and critical thinking among students and instructors.

According to Al-Samarraie and Saeed (2018), the collective individualism present in social networking environments may strategically help in guiding students to meet the requirements of modern university study (Tay & Allen, 2011).

Eventually, outcomes of collaborative activities taking place on SNSs will help students achieve high levels of self-esteem and performance (Al-Samarraie and Saeed, 2018).

Lambić (2016b) mentions that creating a Facebook group is one of the potential ways of using Facebook to support educational activities and making it act as a Learning Management System (LMS). This generally satisfies students, as some of the basic LMS functions can be replaced by Facebook features (Wang et al., 2012).

Schroeder et al. (2010) noted that the affordances and underlying functionalities of social networking sites enhance the educational environment. SNSs are considered to contribute to "cognitive stimulation" and "relational exchanges", as well as helping to facilitate the learning process. This is considered critical for students' overall educational experience (Akyol and Garrison, 2012). How the intensity of SNS usage affects this educational experience, based on an established e-learning framework, is worth further exploration.

2.3   SNS and E-learning

Section 2.3 will discuss literature of educational and social theories and models that could be used to understand the effect of SNS usage on the overall educational experience, and to determine its practicality for educational purposes. Moreover, the section tries to identify an educational framework that is associated with the educational experience taking place on SNS.

In a review of e-learning theories, frameworks and models, Mayes and De Freitas (2007) highlight that it is important to be clear about the assumptions underlying e-learning designs. They claim that there are no specific models for e-learning, rather only enhancements of existing models of learning which use technology to achieve better learning outcomes. Mayes and de Freitas (2007) define theories of learning as "empirically-based accounts of the variables which influence the learning process and provide explanations of the ways in which that influence occurs" (Mayes and De Freitas, 2007, p. 5). A theory provides a general explanation for observations made over time, explains and predicts behaviour, and may be modified (Noh et al., 2013).

Models of e-learning, on the other hand, "describe where technology plays a specific role in supporting learning. These can be described both at the level of pedagogical principles and at the level of detailed practice in implementing those principles" (Mayes and De Freitas, 2007).

Newer theoretical pathways and approaches have been suggested and have undergone investigation by researchers and practitioners. E-learning initiatives need to keep up with developments in these new areas of research, due to the significant impact they have on e-learning practice (Haythornwaite et al, 2007).

According to Noh et al. (2013), numerous studies are being conducted in the areas of learner collaborative behaviour, learner-leaders, e-facilitation, and co-construction of knowledge.

Available sub-areas of collaboration include distributed knowledge, distributed cognition, teamwork, and scientific and interdisciplinary collaboration. The aforementioned

categories are all classified under Computer-Supported Collaborative Learning (CSCL).

A further e-learning theoretical approach is the study of learning communities, which is concerned with the interaction and learning in virtual communities, group behaviour and group learning, as well as the behaviour and learning of "novices" when interacting with experts in Communities of Practice (CoP), communities of inquiry, and knowledge communities (Noh et al., 2013). Models of learning communities will be further discussed in detail under Section 2.3.

Another theory is that of social learning networks; the existing popularity of online social networks has encouraged researchers to investigate how networking ties and relationships impact the learning process, as discussed in Section 2.2.

2.3.1   E-learning Communities

Engelbrecht (2003) indicated that e-learning models first originated as replications of actual instruction taking place in the classroom, but have evolved to include new technology and pedagogy (Noh et al., 2013). Early models, such as the "Demand-Driven" model, only focused on the role of technology in providing online content and electronic services (MacDonald et al., 2001).

Other models that give emphasis to the types of interaction possible in e-learning, such as learner to instructor, learner to learner, learner to content, and learner to context, have also been suggested.

One example of those models is the Community of Inquiry model (CoI) developed by Garrison et al. (2000). The CoI model concentrates on the learning experience and

interactions that drive learning. CoI focuses on the interaction of learners within a community, where they should be encouraged to take responsibility for their own learning. When designing instruction, Garrison et al. (2000) recommend that e-learning designers consider three key elements. The first element is the learner's social presence, which includes learners' ability to establish themselves both socially and emotionally throughout the learning experience. The second is the cognitive presence that refers to learners' ability to construct and confirm meanings through interaction and reflection. The third element to consider is the teaching presence that includes the establishment of structure and process for learning to happen.

A study by Manasijevic et al. (2016a) revealed that, from the perspective of students, collaboration through academic groups facilitates the creation of learning communities, and acts as the most important value of Facebook usage in academic activities.

Many studies acknowledge the existence of social learning communities on SNS (Cassaniti et al., 2014; Duncan and Barczyk, 2013; Manasijević et al., 2016a). Therefore, the CoI as an e-learning model will be further explored in Section 2.3.2 for its eligibility to capture the educational and social experience taking place on SNS.

The social perspective on learning has been greatly acknowledged since the reconceptualisation of all learning as "situated", i.e. the perspective of learning as a social practice (Mayes and De Freitas, 2007). Students will always be subject to effects of the social and cultural context in which learning occurs, which will contribute to defining the learning outcomes. According to this perspective, learning focuses on how knowledge is distributed socially. "When knowledge is seen as situated in the practices of communities,

then the outcomes of learning involve the abilities of individuals to participate in those practices successfully. The focus then shifts from analyses of components of subtasks, and onto the patterns of successful practice" (Mayes and De Freitas, 2007, p. 9). This adjustment is considered necessary to theories of learning, where both behavioural and cognitive levels of analysis became disconnected from social ones. This is where a further e-learning model is introduced, namely the Communities of Practice (CoP). The CoP will be discussed thoroughly in Section 2.3.3 to explore their potential to capture how the educational and social experience is affected by SNS usage in higher education.

2.3.2   Communities of Inquiry

The Community of Inquiry (CoI) framework is recognised as an effective way to explain success in online teaching and learning (Garrison, Anderson, & Archer, 2000; Garrison, Anderson, & Archer, 2010). It was first developed by Garrison et al. (2000) who were aiming to use computer-mediated communication (CMC) to help improve the overall learning experience (Kazanidis et al., 2018). CoI is considered a "collaborative constructivist" model that classifies online courses as successful when students engage in a collaborative and individual "search for meaning and understanding" (Akyol et al., 2009, p. 66). Furthermore, CoI is able to provide descriptions of interactions happening in collaborative learning processes through online environments. A CoI framework aims at both designing and analysing educational activities taking place in online environments that target the establishment of communities of inquiry. The framework combines community, as a social dimension, with the inquiry to create online or blended learning environments. "The social dimension can be observed in any type of community, yet in an

academic setting; CoI requires critical thinking and collective construction of meaning" (Garrison & Vaughan, 2008).

As mentioned in Section 2.3.1, CoI includes three interdependent presences i) the cognitive presence that deals with content, ideas, arguments, or opinions of learning community members; ii) the social presence, which is concerned with the interaction among members, and finally; iii) the teaching presence that is concerned with the role of the instructor and his teaching initiatives towards students. Accordingly, meaningful knowledge acquisition is achieved within a collaborative climate among all members of the CoI (Kazanidis et al., 2018). Figure 2.1 shows an illustration of the CoI framework and the intersection of its three presences.
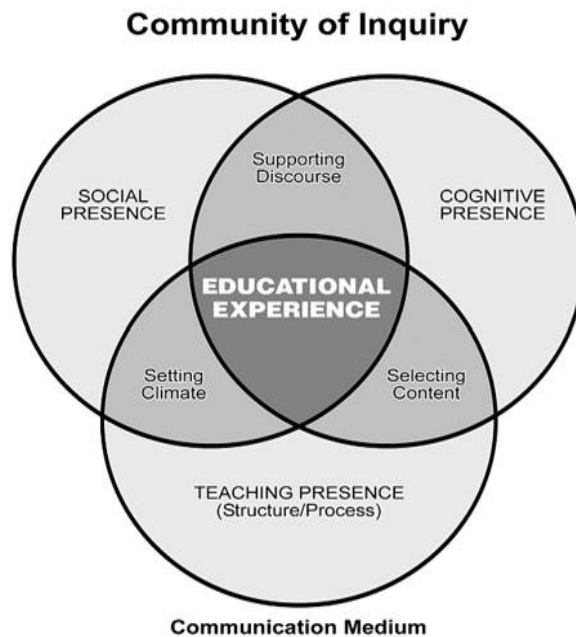
Figure 2.1 Community of Inquiry Framework (Garrison, Anderson and Archer, 2000)

CoI was originally developed for higher education in general, and asynchronous text-based group discussions in particular (Garrison et al., 2010a). Keles (2018) suggests that it could

be extended to face-to-face and blended learning environments, as well as online education, to support and develop learning communities (Hosler & Arend, 2012).

Table 2.3 presents the relationship between the three elements of CoI, as well as examples of indicators associated with those elements, and the categories into which Garrison et al. (2000) have grouped the indicators.

Table 2.3 Community of Inquiry Coding Template

Elements	*Categories*	*Indicators (examples only)*
Cognitive Presence	Triggering Event	Sense of puzzlement
	Exploration	Information exchange
	Integration	Connecting ideas
	Resolution	Applying new ideas
Social Presence	Emotional Expression	Emotions
	Open Communication	Risk-free expression
	Group Cohesion	
Teaching Presence	Instructional Management	Defining and initiating discussion topics
	Building Understanding	Sharing personal meaning
	Direct Instruction	Focusing discussion

Garrison et al. (2000) stated that the categories' names were chosen to be rather self-explanatory. However, the next sections will discuss each presence of the CoI framework in further detail.

2.3.2.1 *Teaching Presence*

Teaching presence could be considered as the key element that facilitates the formation and development of both the cognitive and social presences. According to previous studies, teaching presence strongly correlates with perceived learning, sense of community and student satisfaction (Arbaugh et al., 2008; Garrison and Akyol, 2009; Shea and Bidjerano, 2009). The teaching presence consists of three categories, namely design and organisation,

facilitating discourse and direct instruction. Design and organisation are initiated when instructors plan the process, materials, and structure of the online course before it starts. Facilitating discourse is concerned with motivating learners, encouraging participation, modelling discussion, guiding learners to reach higher levels of thinking, and finally evaluating the effectiveness of the learning process (Tolu, 2013). The third category, direct instruction, refers to instructors' academic leadership and knowledge sharing. Anderson et al. (2001) discussed some of the following direct instruction indicators: presenting content, summarising the discussion, providing timely feedback, clarifying misconceptions, confirming understanding through assessment, providing content from different sources, as well as helping students with technical problems. Direct instruction was found to be positively correlated with student satisfaction and perceived learning (Shea et al., 2003).

2.3.2.2 *Social presence*

Social presence refers to how people can participate in the community of inquiry by projecting themselves emotionally and socially via the medium of communication being used (Garrison et al., 2000). Social presence consists of three categories, namely, group cohesion, open communication, and affective expression. Open communication indicates that the learning climate should ensure participants' feeling of security and comfort in order to freely express themselves and hence, take part in learning activities. In order to create a sense of trust among learners, interpersonal interaction is required. When learners form a group identity and collaborate, in order to achieve common goals, group cohesion is achieved. Affective expression, however, is about reflecting emotions and connectedness between participants. Students participating in online classes may take a long time to start feeling ready to express their emotions. Indicators of this element include humour,

self-disclosure, and emojis (Stark and Crawford, 2015a). This requires learners to know each other, work with each other, ensure frequent interaction with each other, and feel responsible for contributing to the group's achievement, as this establishes the sense of social presence. Social presence can be strongly present in computer-mediated communication (Richardson et al., 2012; Tolu, 2013). However, during online interaction, learners and instructors are required to use certain strategies and techniques in order for a social presence to be established (Garrison et al., 2010a).

Social presence can be defined as the number of social and emotional connections present among a learning community (Richardson et al., 2012). Social presence is essential because studies have shown a relationship between social presence and student satisfaction, learning community development, and perceived learning (Lowenthal, 2009).

2.3.2.3   *Cognitive presence*

Cognitive presence is established on the postmodernist paradigm and Dewey's reflective thinking (see Dewey, 1916). It can be defined as the learner's ability to reflect and confirm meanings through participating in practices of reflective discourse (Garrison & Arbaugh, 2007). The practical inquiry model of learning (see Figure 2.2), is a four-phased model that explains the cognitive presence, which in turn represents the core of the CoI framework (Garrison et al., 2000).

Cognitive presence, however, is the most difficult to establish out of the three elements of the CoI framework (Arbaugh, 2007), as it requires strong social and teaching presences. Learners need to feel social presence, especially group cohesion, in order to engage in learning tasks. Course design, methods, materials, and activities, and all learning and

teaching practices require effective planning in order to facilitate critical and meaningful learning that links us back to the role of teaching presence discussed in the previous sections (Garri`son et al., 2006).
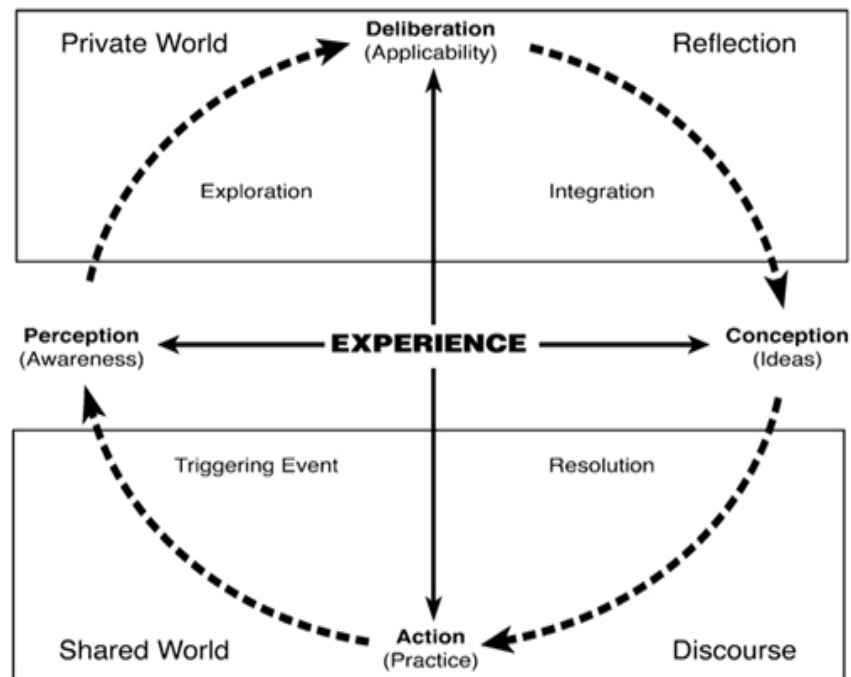
Figure 2.2 Practical Inquiry Model of Learning (Garrison et al., 2000)

The "Practical Inquiry Model" focuses on the processes involved in thinking and can be utilised as a tool for assessing "higher-order thinking" (Garrison & Anderson, 2003; Garrison et al., 2001). The model includes four phases for learning, starting with a "triggering event" that stimulates curiosity, as shown in Figure 2.2. The model proceeds with the "exploration" of information; then "integration" of new information; and finally concluding with the "resolution" of the problem or inquiry in ways that students can reapply in the future (Richardson et al., 2012).

The achievement of the CoI presences were proven to produce positive outcomes in online courses, including student satisfaction and perceived learning (Akyol and Garrison, 2011;

Arbaugh, 2007; Arbaugh et al., 2008; Richardson et al., 2012; Rourke et al., 2001), as well as enhancing class performance (Picciano et al., 2012). Furthermore, the validity and effectiveness of the CoI framework has already been proven in both asynchronous and synchronous learning settings (Garrison and Arbaugh, 2007).

In online courses, all of the aforementioned teaching and learning behaviours are mediated by technology. In this study SNS, as a technology-based communication medium that has many relevant affordances, will be explored and investigated.

Rubin et al. (2013) indicate that technology used for supporting online courses might affect the frequency in which students and faculty interact, give and receive feedback, and interact with course material. When a strong CoI is present in an online course, students contribute to discussions, are more satisfied with the learning experience. Therefore, it is worth examining the relationships between technologies used for supporting online courses, and the ability that it provides for students and faculty to engage in educational activities, as well as the relationships with the CoI.

Garrison (2011) emphasises that the CoI framework "represents a process of creating a deep and meaningful learning experience through the development of three interdependent elements—social presence, cognitive presence and teaching presence. A presence is a sense of being or identity created through interpersonal communication" (p. 22). Regardless of the learning context, a presence is conceptualised as a "value-based" concept. This means that a given communication medium, or the affordances that this medium offers, may facilitate different degrees of a given presence.

According to Garrison et al. (2000), tools that support CoI should be computer-mediated

text-based conference software. Hence, SNSs are eligible to be tools that support CoI. Even though the framework was originally constructed to allow identifying the three types of presence in text-based transcripts, researchers have applied it to blended-learning environments as well (Akyol & Garrison, 2011).

Garrison and Kanuka (2004) emphasised the effectiveness of blended learning in maintaining a sense of community, since it blends between electronic and face-to-face contact.

2.3.3   Communities of Practice

This section will present the Communities of Practice (CoP) model, as one of the models of learning communities mentioned in Section 2.3.1. CoP are defined by Serrat (2010) as "groups of like-minded, interacting people who filter, amplify, invest and provide, convene, build, and learn and facilitate to ensure more effective creation and sharing of knowledge in their domain. They define themselves according to their focus, how they function, and what capabilities they produce" (Serrat, 2010, p. 104).

CoP consists of six main dimensions i) domain; ii) community; iii) practice; iv) motivation; v) structure; and vi) mandate. While a domain represents the area of shared inquiry, 'community' refers to connections between members of the community, as well as the sense of belonging they have to this group. 'Practice' represents the body of knowledge and information available in the CoP where each member has proficiency in the domain, and this is also recognised by the rest of the members. 'Motivation' signifies personal interests of members to commit to activities in the CoP. 'Structure' refers to the balance between formal and informal relationships and methods collaboration. Unlike the case with

CoI, hierarchy is not an important factor in CoPs. Members' status or rank is evaluated by the value of contributions they make to the community. Therefore, for the study at hand, CoI would be a more suitable framework to measure dimensions of the educational experience in an instructor-student setting, where faculty members have higher rank and authority teaching courses in higher education.

One of the key concepts of CoP is community knowledge, where the sum of this knowledge is larger than the sum of individual participants' knowledge (Wenger, 2010). The combined knowledge of the group develops, while simultaneously developing each individual's knowledge. A CoP can be viewed as a social learning system (Wenger, 2010).

Au et al. (2009) state that a CoP is strongly related to collaborative learning. "Collaborative learning engages small groups of people who encourage each other to maximise their own and each other's learning" (Tu, 2009, p. 12). Collaborative learning involves learners in inspiring each other, depending on each other, sharing knowledge, as well as authority in the group.

2.3.4 Blended Learning

Kaur (2013) states that blended learning is effectively combining different modes of delivery and teaching models, which are implemented in a learning environment. Blended learning courses include both online and classroom learning activities, as well as resources, in an ideal way to help improve student learning outcomes (Garrison, 2004).

Chmiel et al. (2017) indicate that blended learning or hybrid learning approaches are increasingly prevailing. Blended learning combines classroom interaction and face-to-face instruction with online delivery of educational content (Shea, 2017).

From an educational viewpoint, blended learning indicates integrating two different paradigms, online where communication is asynchronous in nature, and the classroom where communication is synchronous (Chmiel et al., 2017).

The reasons behind ongoing interest in designing effective blended learning environments is that combinations of face-to-face and online educational activities have been revealed to offer numerous new opportunities for optimising learning (Boelens et al., 2017). This denotes a redefinition of instruction, where instructional activities are designed by technology, which was previously difficult to establish (Boelens et al., 2017).

Boelens et al. (2017) report that when online sessions are used to supplement traditional teaching methods, students responded better and learned faster (Graham et al., 2014; Korr et al., 2012). Moreover, blended learning allows students to be flexible and to freely provide and receive face-to-face feedback in the classroom (Korr et al., 2012).

Matukhina and Zhitkovab (2015) state that "many researchers consider a rational combination of traditional educational technologies with modern information and communication technologies as one of the possible ways to solve the problem of modernising education on the basis of information". According to discussions in Section 2.2, one of the promising contemporary tools in education are in fact SNSs.

In a study by Ali et al. (2018), a total of 259 journal articles were thoroughly reviewed with the purpose of identifying possible barriers to e-learning implementation. Sixty-eight

unique barriers were defined and grouped into four conceptual categories, namely i) technology; ii) individual; iii) pedagogy; and iv) enabling conditions. These four categories formed a framework that highlights the key concepts hindering e-learning implementation and delivery.

One of the barriers that were related to e-learning technology was "software and interface design". The study states that multiple articles in the reviewed literature mentioned that interface design of software used during the e-learning experience was not user-friendly (Ali et al., 2018). On the other hand, this same factor, i.e. interface design, was listed by numerous studies as one of the advantages, when using SNSs as a tool for online learning as previously discussed in Section 2.2 (Manca and Ranieri, 2016a; Mao, 2014; Menzies et al., 2017).

Another barrier that falls under the "individual" category is "sense of isolation due to less face-to-face interaction", where the absence of face-to-face social interaction between learner and instructor results in a sense of isolation. Therefore, blended learning, with its nature of mixing between virtual learning sessions and physical face-to-face classes, could prevent this social detachment from occurring between students and instructors (Shea and Bidjerano, 2013).

Other barriers listed by Ali et al. (2018) include social loafing, student readiness, weak LMS, material accessibility, acceptance of e-learning technologies, as well as the limited administrative support and other security concerns of e-learning systems.

This poses the question of whether using SNSs as non-traditional learning tools makes them eligible to overcome some of the barriers of e-learning. Therefore, as part of the

research aim, this study will explore both the opportunities and challenges that SNSs face as learning tools in higher education.

Hubackova and Semradova (2016) suggest that the success of Blended learning depends not only on the quality of the course and the virtual environment but also on the grade to which the students are prepared to work in their virtual study environment. It also depends on their ability to make themselves organised in a given background and use all the tools offered by LMS.

An increasing number of students tend to receive their education with minimal time loss, since the rapid pace of life leaves less time for face-to-face learning. To date, blended learning is a fast and dynamic mode of training. Blended learning tools include LMSs, which will be discussed in Section 2.4.

2.4   SNS and Learning Management Systems

Learning Management Systems (LMSs) are expensive to acquire and maintain (Hill, 2012). Some LMS companies charge a considerable annual fee for access to the software, while other LMS software is free and openly available. Nevertheless, installing the software, maintaining the computer servers, and upgrading the software require investment in both hardware and personnel (Butler University, 2012).

Faculty and students should be trained to use LMSs, and instructional tools should be set up to support teaching and learning (Chao, 2008; Petherbridge & Chapman, 2007). This requires investment of time from faculty and instructors who use the online resources, in order to supplement their classes. Therefore, it is important to understand LMS's effects on teaching and learning (Rubin et al., 2013). The current study will try to explore

possibilities of SNSs overcoming drawbacks of LMSs to form opportunities for SNSs' usage in higher education.

Al-Samarraie and Saeed (2018) state that most of the LMSs commonly used offer some form of communication between class instructor and participants. Features that facilitate productive collaboration include chat, email or forums.

Previous studies show that students' collaboration on LMS can increase their motivation by adding the necessary level of support needed for students to experience a sense of connectedness and competence (Al-Samarraie and Saeed, 2018). However, when the group's proficiency level is low, students in the LMS course find it difficult to construct meanings that go beyond the learning context (Al-Ismaiel, 2013).

Learning technologies have been analysed in terms of their affordances, as previously discussed in Section 2.2.2, i.e. the actions they enable (Kirschner, 2015; Manca and Ranieri, 2016; Smith, 2016).

Kirschner et al. (2004) state that education occurs in "a unique combination of technological, social, and educational contexts and affordances" (p. 50). They classify affordances of learning technology into educational and social affordances. Educational affordances support learning activities, while social affordances support interaction between students and instructors and among other students.

A relevant, yet distinct concept related to the effectiveness of learning technologies is the concept of usability, which is defined as how well "a system allows for the accomplishment of a set of tasks in an efficient and effective way that satisfies the user" (Kirschner et al., 2004, p. 50).

Research found that students' perceptions of the overall ease of use of the LMS is reflected on their satisfaction with online learning (Deng and Tavares, 2013a; Ifinedo et al., 2018).

2.4.1   LMS and Facebook

Deng and Tavares (2013a) studied students' engagement in Facebook discussions compared to their lack of eagerness in joining forums on Moodle, their university's official LMS. They created a FB group which has proven to address their needs from informal chatting to more serious academic discussions. The FB group provided students with informational, social as well as intellectual support in a timely manner. It is worth studying the eligibility of SNS to satisfy LMS requirements in higher education. Therefore the nature of its usage in the educational context has to be explored.

Deng and Tavares' (2013) study resulted in a three-level model that describes technological, individual, and community aspects of students' online engagement. Stronger engagement with Facebook depended on students' FB usage habits. This can be linked back to Facebook usage intensity previously discussed in Section 2.2.1. Moreover, students' sense of ownership and the social presence taking place in their online community also increased their engagement with using FB for this course. Facebook interaction was instant, spontaneous, and supported their sense of community (Deng and Tavares, 2013a).

On the other hand, Moodle's interface was found to be not user-friendly and had very low rates of activity, because students resisted using it. Despite the interesting findings, however, one of Deng and Tavares' study's limitations is that authors could not gain access to the Facebook group to collect more objective and quantifiable data on their

interaction and participation in it. Therefore, it is important to get more access and understand how students and faculty members use FB in their educational activities.

Wang et al. indicate that creating a Facebook group is one of the potential ways of using Facebook to support educational activities and make it act as a Learning Management System (LMS). This generally tends to satisfy students because FB features could replace some of the basic LMS functions (Wang et al., 2012).

2.5   Social Dimensions of Online Classroom Community

In this section a review of some of the social theories that emerged due to the existence of SNS will be discussed.

2.5.1   Sense of Connectedness

Duncan and Barczyk (2013) argued that few studies gave attention to the potential of web-based technologies to build classroom communities that engage students in higher education (Hurt et al., 2012). Rovai (2002b) defines a classroom community as a "feeling that members have of belonging, a feeling that members matter to one another and to the group, that they have duties and obligations to each other and to the school, and that they possess shared expectations that members' educational needs will be met through their commitment to shared learning goals" (p. 322). Rovai (2002b) argues that classroom community includes two factors. The first factor is connectedness, which is "the feeling of belonging and acceptance and the creation of bonding relationships" (p. 322).

The second is learning, which is "the feeling that knowledge and meaning are actively constructed within the community, that the community enhances the acquisition of knowledge and understanding, and that the learning needs of its members are being satisfied" (p. 322).

Duncan and Barczyk (2013) indicate that it is important for future research to investigate how Facebook helps build classroom community. They add that if used properly, Facebook may increase student engagement by cultivating classroom community and stimulating intellectual discourse (Hurt et al., 2012). Therefore, Facebook usage could be associated with the sense of connectedness through the social presence of the CoI framework, which is in turn a model of an e-learning community.

2.5.2 Sense of Belonging

The desire for social bonds and connections with others indicates the need for affection between people (Murray, 1938), the need for positive regard from others (Rogers, 1951), belongingness (Baumeister & Leary, 1995; Goodenow, 1993b; Maslow, 1954), affiliation motivation (McClelland, 1987), and the need for relatedness (Deci & Ryan, 1991; Ryan, 1993; Vallerand, 1997). As suggested by Goodenow, the need for relatedness "involves feeling connected" (p. 300). Goodenow proposed that a sense of belonging at school reflects "the extent to which students feel personally accepted, respected, included, and supported by others in the school social environment" (Goodenow, 1993).

Baumeister and Leary (1995) believed that the need to belong is characterised by the need for regular contact and maintaining stable interpersonal relationships, and affective

concerns. This relational perspective of interactions with others is significant for satisfying the need to belong.

The need for belonging can contribute to explaining a variety of human behaviour - cognitive, motivational processes, and emotions. This could be linked back to elements of the three CoI presences, discussed previously in Section 2.3.2, where emotions and affective concerns are classified under the elements of the social presence.

2.5.3 Sense of Belonging among Students

Goodenow (1993b) defined 'sense of belonging' in educational settings as "Students' sense of being accepted, valued, included, and encouraged by others (teacher and peers) in the academic classroom setting and of feeling oneself to be an important part of the life and activity of the class. More than simple perceived liking or warmth, it also involves support and respect for personal autonomy and for the student as an individual." (p. 25).

Educational researchers agree that the need to belong is one of the most important needs of all students to positively adapt in all types of learning environments (Connell & Wellborn, 1991; Deci & Ryan, 1991; Finn, 1989; Osterman, 2000). The feeling of belonging was found to have a direct and strong influence on students' motivation (Goodenow, 1993b). Moreover, perceived support and the sense of belonging increase students' beliefs in their success and consequently increase their academic motivation.

Studies revealed that students who experience a sense of belonging within their educational environments are more engaged and motivated in their educational activities (Osterman, 2000). Furthermore, students who felt they belong to learning environments reported higher satisfaction, enthusiasm, happiness, interest, and more confidence in

engaging in learning activities, while those who felt isolated reported greater anxiety, boredom, frustration, and sadness during the academic engagement that had a direct effect on their academic performance (Furrer & Skinner, 2003).

Osterman (2000) specifies that satisfying the need for belonging in educational environments is significantly associated with students' involvement, academic engagement and classroom activities, and academic and social behaviours.

Nagel and Kotzé (2010) state that instructor immediacy causes a feeling of closeness or belonging. According to the CoI, social presence indicates whether the participants see themselves as part of a community to which they feel they belong, in this case the classroom or group. Students should feel free to express themselves openly in the environment without fear of rejection and convey their own personalities and feelings (Arbaugh et al., 2008).

Since SNSs are tools that offer social interaction in the first place, it is worth investigating how its usage in education might affect social dimensions relevant to online learning communities.

2.6 Summary

Examples of widely used SNSs include Facebook, Twitter, and MySpace. Because this study explores the use of a supporting technical tool, it is essentially important that the population under study would accept the utilisation of that tool.

Therefore, a significant factor in choosing the SNS to study, apart from technical characteristics, is the popularity of that SNS among students and faculty members. In this research, only one SNS is chosen to be explored, i.e. Facebook.

Despite its vast educational potential, the role of Facebook usage, as part of educational practices and learning activities, still requires further exploration (Lau, 2017; Manca and Ranieri, 2016a; Menzies et al., 2017). The reason behind this is the lack of comprehensive empirical studies that try to understand the effect of using an SNS, such as Facebook, on the overall educational dimensions through an educational framework or model. Moreover, since Facebook is first and foremost a social tool, education-related social dimensions are also worth exploring and linking with the overall educational experience. No previous studies have yet reported how the intensive use of Facebook affects the educational experience of higher education students. The Facebook usage intensity (FBUI) is an important factor that measures users' emotional connectedness and engagement with the use of Facebook (Ellison et al., 2007). FBUI is considered superior in comparison to traditional standards of frequency of use, time spent or duration of service uses, as it takes into account the richness of the user experience delivered by the usage of Facebook (Valenzuela et al., 2009).

In order to capture the various dimensions of the educational experience, the Communities of Inquiry framework represents the most eligible educational framework, since it measures the three presences that occur through computer mediated discussions in the educational context, namely the teaching, social, and cognitive presences (Garrison et al., 2000). It is essential for academics and practitioners to understand the empirical connections between the Facebook usage intensity and the educational experience

represented by the three CoI presences. The validity and effectiveness of the CoI framework has been proven by previous studies in both asynchronous and synchronous learning environments (Garrison and Arbaugh, 2007; Richardson et al., 2012; Tolu, 2013).

This investigation will enable academics to understand the effect that Facebook usage intensity has on the teaching, social, and cognitive dimensions of the educational experience in higher education. Moreover, perspectives of both students and instructors are investigated to ensure a comprehensive understanding of the context. The study will also help better understand the educational potential of using Facebook as an effective learning tool in higher education.

Kollock (1998) lists nine principles for making virtual communities work, and the first principle is the use of software that promotes good discussion. According to literature reviewed in Section 2.2, Facebook is eligible for being a very suitable tool for making a virtual community work (Aydin, 2012; Bowman and Akcaoglu, 2014; Caers et al., 2013; Manca and Ranieri, 2013; Miron and Ravid, 2015; Schein et al., 2010). Therefore, the effect of the intensity of Facebook usage, as an SNS, on the educational experience conceptualised by the Communities of Inquiry model, will be investigated in this study.

SNSs' role in higher education is prevailing due to its ease of use as a technology and its ability to help create a positive learning community (Greenhow and Lewin, 2016). However, there are limited studies and a degree of uncertainty, when it comes to how SNSs such as Facebook can best be utilised in education. Since SNSs are very popular among students, educators should integrate these technologies into education with a pedagogical basis. This study will offer educators useful information regarding the

effective use of SNSs for educational purposes. Furthermore, investigating aspects such as the sense of belonging to the academic institution and sense of connectedness between students will help shed light on further social dimensions that are present in the educational context.

Waiyahong (2014) specified that standardised research tools should be prepared to study the behaviour of Facebook usage of undergraduate students, and that they should be applicable to designing and improving related theories and conceptual frameworks to build various learning communities. This adds to the need for validating the current study.

Since educational technology is the major enabler of communities of inquiry, an important Web 2.0 technology such as SNSs should receive considerable research attention (Kovanović et al., 2015). Effects of educational technology affordances on the three dimensions of the CoI model have hardly been reported in the literature published to date. Moreover, the number of studies with an effective theoretical and educational basis for evaluating the learning dimensions taking place on social network sites is very limited (Aghili et al., 2014; Ozturk, 2015).

Chapter 3 – Research Methodology

The research methodology chapter provides an overview of the methods and procedures used to conduct the study. A description of the research design, research questions, research populations and samples, instruments, data collection and analysis procedures are presented and discussed.

3.1   Overview of Research Methodology

This chapter describes the formulation of the research design and methodology adopted to achieve the aims and objectives of the study. Hussey & Hussey (1997) define methodology as the overall approach of the research process starting from the theoretical underpinning to the collection and analysis of the data (Gill & Johnson, 2002). The methodology in any research is supposed to specify how the research will be conducted and controlled. The aim of this chapter is to provide an explanation of the research and methods used in order to achieve the objectives of the study.

The general aim of the study is to understand how using SNS, as a technology-based factor integrated with educational activities, affects the educational and social experience of students and faculty members in higher education institutions. Furthermore, the study seeks to explore opportunities and challenges facing SNS as an educational tool. The research aims to bridge a technology-based factor with social factors, across an educational theoretical framework.

Previous studies indicate that SNSs are now an integrated part of the educational community and contribute to a wide range of teaching and learning practices (Duncan and Barczyk, 2013; Manca and Ranieri, 2016a). Yet, very limited studies tried to connect the usage of SNSs with educational theoretical frameworks and social theories to understand their effect on the various dimensions of the overall educational experience in higher education.

Accordingly, three research questions were formulated and are answered throughout the research process.

RQ1: How do faculty and students view and use SNS in higher education institutions?

RQ2: How does using SNS affect the educational and social experience in higher education institutions?

RQ3: What are the opportunities and challenges facing SNS, as a learning tool, in higher education institutions?

Closely connected to these research questions is the conceptual framework for the study (see Figure 3.1), which demonstrates its exploratory and descriptive nature; this helps establish the relevance to the research methodology employed.

Existing studies on SNS usage in higher education have revealed that students and faculty from various disciplines are using social media to support their face-to-face or online courses. The studies have revealed that the activities mainly engaged students in connecting with peers and with learning outside the classroom, commenting on each other's work, collaborating, and creating projects through social networking sites and other Web 2.0 technologies.

Most of the studies have reported the effectiveness of SNS in the classroom and the sense of community that is developed through the use of these technologies. Although empirical research on the effectiveness of social media in education is limited, the research to date suggests that social media does have a positive impact on students' learning and the classroom environment, which creates the need to explore the dimensions of the educational experience; hence the CoI presences studied in this research. Existing studies did not specifically examine whether using Facebook or other SNS affect the educational experience as a whole or not, nor did they associate it with social dimensions such as students' feeling of belonging to their academic institution. Examining where SNS, especially Facebook, do and do not fit in the educational process is critical for understanding and recommending best practices in using SNS as a supporting educational tool.

Despite its vast educational potential, the role of Facebook usage as part of educational practices and learning activities still requires further exploration (Lau, 2017; Manca and Ranieri, 2016a; Menzies et al., 2017). The reason behind this is the lack of comprehensive empirical studies that try to understand the effect of using an SNS, such as Facebook, on the overall educational dimensions through an educational framework or model. Moreover, since Facebook is first and foremost a social tool, education-related social dimensions are also worth exploring and linking with the overall educational experience.
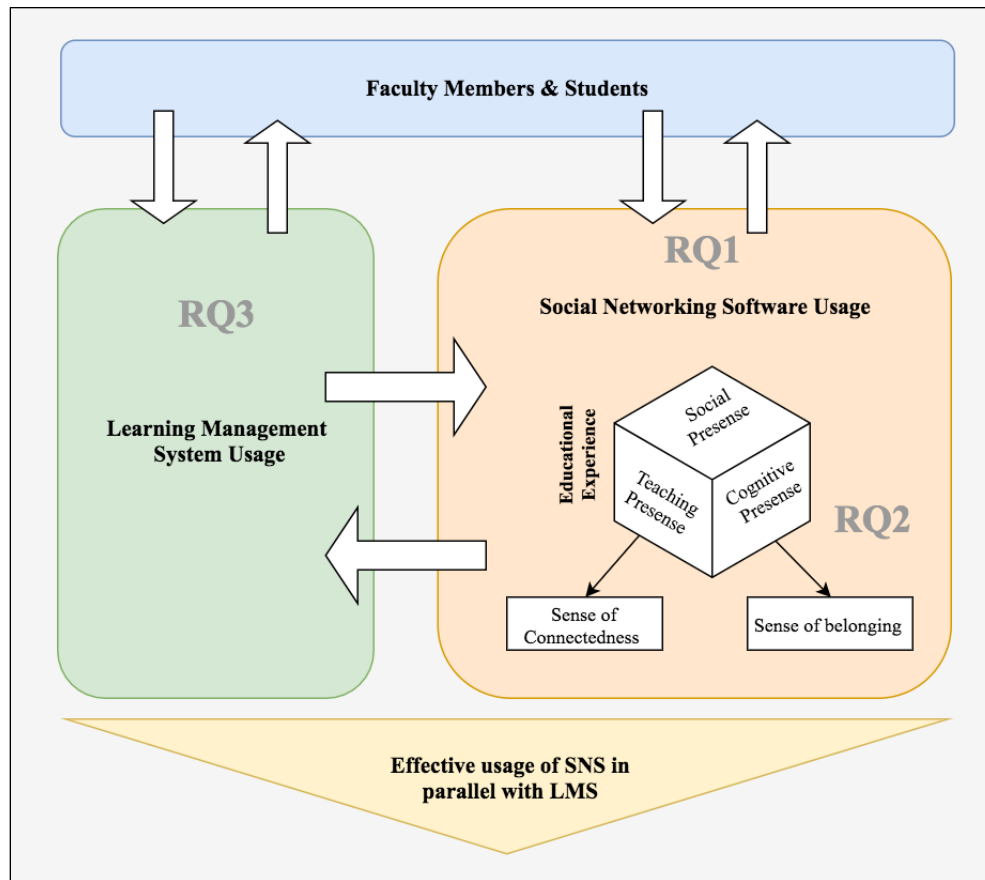
Figure 3.1 Conceptual Framework

No previous studies have yet reported how the intensive use of Facebook affects the educational experience of higher education students. Facebook usage intensity (FBUI) is an important factor that measures users' emotional connectedness and engagement with the use of Facebook (Ellison et al., 2007). FBUI is considered superior in comparison to traditional standards of frequency of use, time spent or duration of service uses, as it takes into account the richness of the user experience delivered by the usage of Facebook (Valenzuela et al., 2009).

In order to capture the various dimensions of the educational experience, the Communities of Inquiry framework represents the most eligible educational framework, since it

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This investigation will enable an understanding of the effect that Facebook usage intensity has on the teaching, social, and cognitive dimensions of the educational experience in higher education. Moreover, perspectives of both students and instructors are investigated to ensure a comprehensive understanding of the context. The study will also help better understand the educational potential of using Facebook as an effective learning tool in higher education.

Furthermore, investigating aspects such as the sense of belonging to the academic institution and sense of connectedness between students will help shed light on further social dimensions that are present in the educational context.

Research methodology refers to "the organised examination of finding solutions to a problematic situation" (Burns, 2000). There are multiple perspectives through which research methodology can be viewed. However, Saunders et al. (2008) propose a layered approach that will be followed throughout the current study, and will be used to structure the discussion of Chapter 3. The research process will be linked to the layers of Saunders et al.'s research onion shown in Figure 3.2.
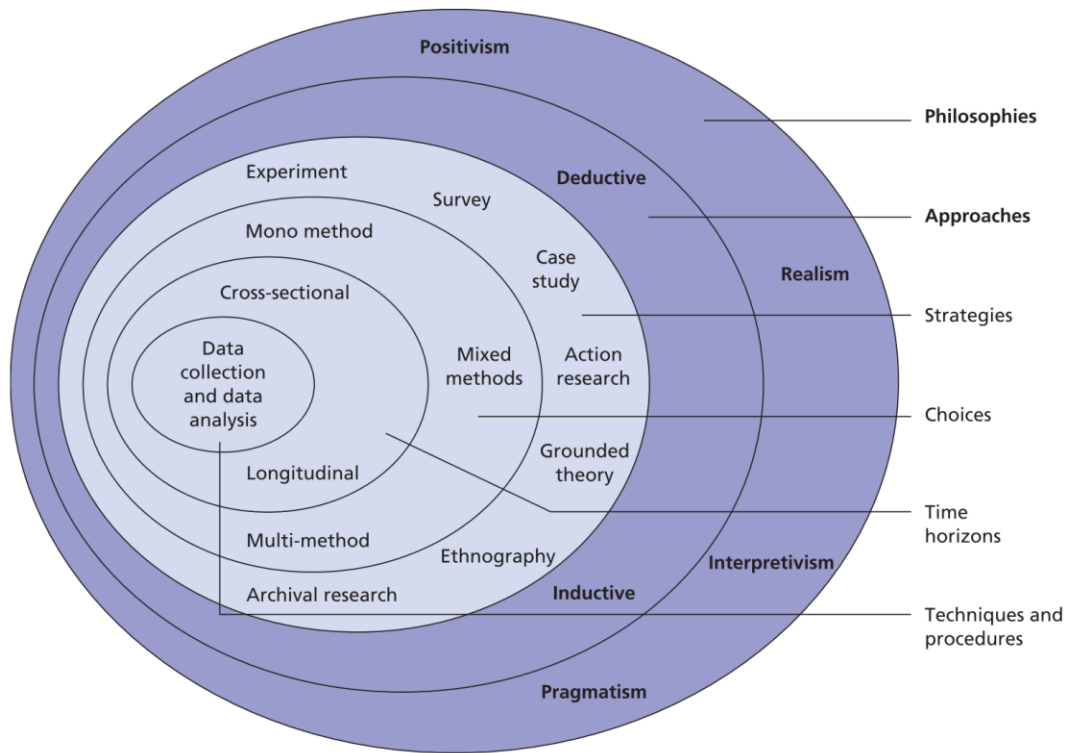
Figure 3.2 The research onion (Saunders et al., 2008)

In accordance with the layers of Saunders et al.'s (2008) research onion, Section 3.2 discusses research philosophies; Section 3.3 goes through research approaches; Section 3.4 presents and justifies research strategies chosen for the study; Section 3.5 reviews and presents different method choices; Section 3.6 discusses time horizons applied to the research; Section 3.7 explains the data gathering methods including sampling and the design of the research instruments, and the data collection techniques and analysis procedures; and Section 3.8 goes through issues of research credibility and ethical considerations. Finally, Section 3.9 summarises the research methodology used throughout the study.

3.2   Research Philosophies

Kuhn (1970) describes research philosophy as a set of ideals that practitioners refer to. There are three viewpoints of a research philosophy that are appropriate for studies in the field of business and social sciences. These are realism, positivism, and interpretivism, as shown in Figure 3.3 (Cooke-Davies, 2002).
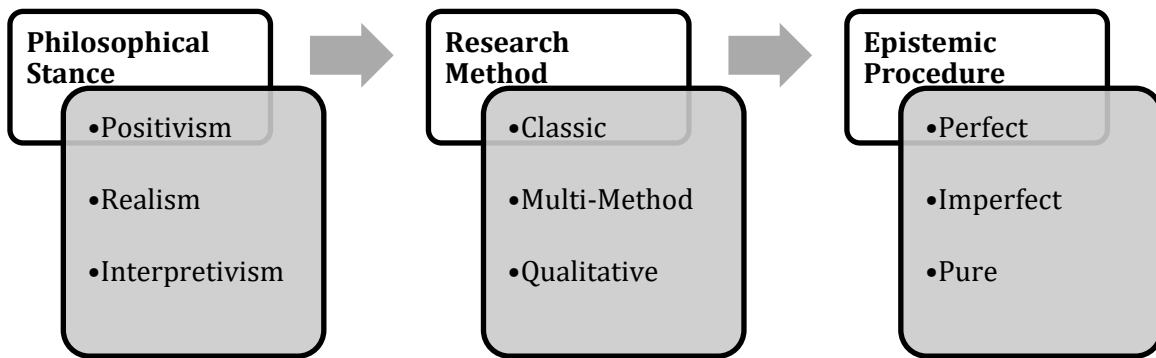
Figure 3.3 Research methods and underlying paradigms (Cooke-Davies, 2002, p. 109)

The two extensive epistemological stances include positivism and interpretivism (Bryman, 2012). Based on Neuman (2005) and Saunders et al. (2012), positivism is the theoretical basis for most quantitative studies. It is known as the philosophical stance, which views social science as a logical way that conglomerates deductive reasoning with precise empirical observations of the behaviours of an individual. This standpoint determines and acknowledges a set of laws of cause on probability that can be applied to expect overall designs of human practices and actions (Saunders et al., 2012).

On the other hand, the interpretivism position refers to the theoretical structure for numerous studies conducted in qualitative approaches (Saunders et al., 2012). It is known as the philosophical position that sees the complexity of the social world and supports the

importance of understanding and interpreting differences between humans in their associations and engagements with one another, as well as with general systems in society (Maxwell, 2006; Saunders et al., 2008).

Guba and Lincoln (2002) used the terminology "paradigm" in defining a paradigm as the fundamental custom or worldview that gives guidance to the researcher regarding methodology choices, ontology, and epistemology. Moreover, they claimed that considering paradigms should precede considerations of which methods to use. Methodology can be presented as "reflexive examination and advancement of the how's of formulating theory, making observations, analysis, interpretation and illustrates method as the exact systems, guided tacitly or clearly by the considerations of methodology" (Guba and Lincoln, 2002). According to this perspective, methodology acts as link between the overall, highly elevated assumptions which researchers in the field often have no knowledge about. Methods, on the other hand, are the precise practical ways that are employed for data collection, analysis and interpretation. Similarly, Pickard (2007) suggested the "research hierarchy" shown in Figure 3.4.

Research Paradigm	
Positivist	Inerpretivist

Research Methodology	
Qualitative	Quantitative

Research Method	
Survey	Case Study

Research Technique		
Questionnaire	Experiment	Interview

Research Instrument	
Human	Pencil & paper
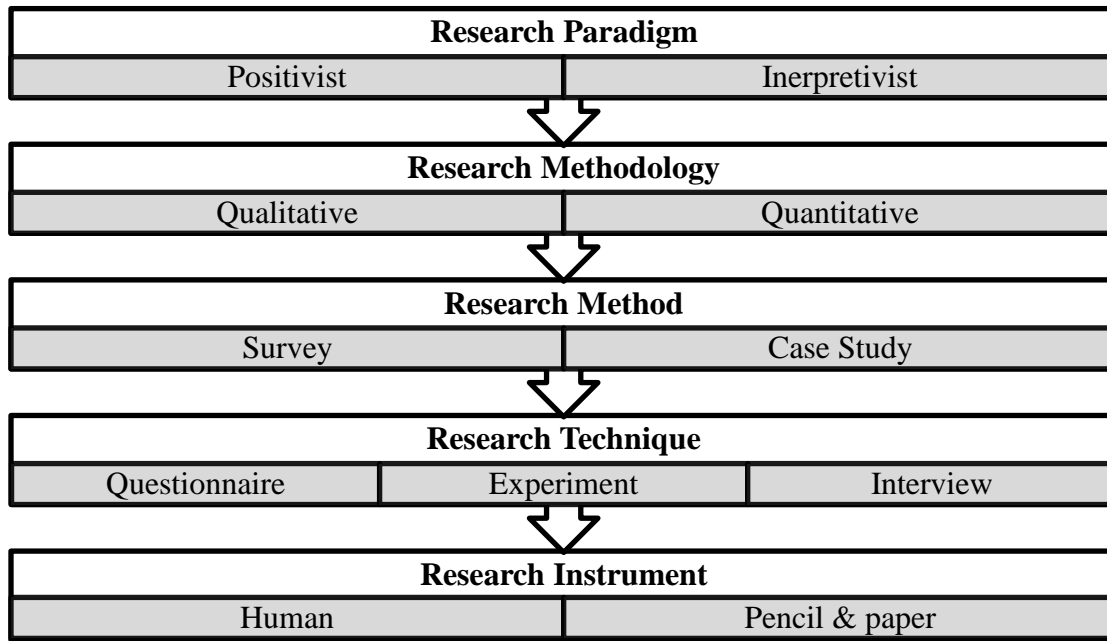
Figure 3.4 Pickard's research hierarchy (Pickard, 2007)

The term 'ontology' implies the existence of nature (Guba and Lincoln, 2002). In other words, it reflects the nature of reality (Saunders et al., 2008). Ontology ranges between two extremes, either objectivism or subjectivism (Neuman, 2005; Bryman, 2012). The objectivity implies that there is an autonomous reality, which is the result of processes existing in society (Neuman, 2005). Subjectivism, on the other hand, views that social occurrences result from what the social actors perceive (Saunders et al., 2008).

Epistemology and ontology tend to develop together, and a solid link exists between the two terms (Crotty, 1998; Guba and Lincoln, 2002). For example, a researcher who adopts a positivist position tends to look at reality as prevailing across the globe but needs to be exposed by applying conservative technical methodologies. Therefore, researchers and investigators can only apply quantitative methodology to determine truth and reality (Cohen et al., 2011). Positivist investigators do not view themselves as significant

variables in their study and consider that they should remain distinct from the subject matter under study (Cohen et al., 2011). Therefore, the social certainty aspect for positivists suggests that the existence of empirical facts is separate from individual ideologies or sentiments and that they are governed by cause and effect laws (Crotty, 1998; Neuman, 2005).

Researchers who adopt an interpretivist position refuse the idea that reality is scientific (Saunders et al., 2008). An interpretivist perceives reality as a "manmade" concept and believes that individuals create their own perception of social realities. Therefore, an interpretivist usually applies methodologies of qualitative research for the investigation, interpretation, and description of social realities (Cohen et al., 2011). Accordingly, the nature of reality for interpretivists is that inquiry is interpretive in nature, and the rationale is to comprehend the exact phenomenon.

In the current study, the researcher used a mixture of perspectives, combining the interpretivist and the positivist positions and subjective and objective points of view to help address the research problem. According to previous studies, there are inevitable debates concerning epistemology and ontology. The debate is about having to choose between the positivist and the interpretivist position (Saunders et al., 2008). Therefore, research questions form the most vital choice element for the philosophy of the study. A qualitative approach may be more appropriate than quantitative in the quest to answer a certain question and vice versa (Creswell and Plano Clark, 2007; Saunders et al., 2008). Consequently, numerous social and behavioural experts have embraced a paradigm distinct from interpretivism which applies qualitative methods, and positivism, which mostly applies quantitative methods. A paradigm that joins the two approaches (qualitative and

quantitative) in one research study is known as pragmatism. Pragmatism best describes the research philosophy of the current study. According to Cotten et al. (1999), pragmatism indicates that there is no single way of interpreting data that can capture the entire picture of the situation. Pragmatism gives freedom of application of mixed methods for studying social and behavioural studies (Saunders et al., 2008). The reason behind mixing different methods is that neither the qualitative nor the quantitative approaches can fully cover the details and trends involving a particular instance (Bryman, 2012). Therefore, the quantitative and the qualitative methods are compatible and complement each other (Creswell and Plano Clark, 2007).

Cotten et al. (1999) and Saunders et al. (2008) believe that answers to research questions, in numerous social and behavioural science studies, are best given by applying mixed methods. They argue that it is more appropriate for researchers to deliberate on the philosophy selected as a range rather than viewing it as a contrast. Therefore, they stressed the significance of the research questions more than the paradigm, and encouraged researchers to apply appropriate methods in their quest to respond to the questions of their study.

The current study adopts a mixed method approach, where qualitative and quantitative methods are applied for investigating the various elements of the study. This is enhanced by "positivism" in testing fundamental assumptions through questionnaires. However, the "interpretivism" approach is embraced when dealing with the data collected from Facebook as well as interviews and focus groups.

3.3   Research Approaches

There are two possible approaches that could be adopted in a research study: the deductive and the inductive approach (Saunders et al., 2008). The deductive approach indicates developing a theory and/or hypotheses and later designing and following a research strategy that tests these assumptions. When following the inductive approach, data is collected first, and then a theory is developed as a result of the analysis of this data. Usually these research approaches are linked to the research philosophies followed; deduction belongs more to positivism while induction is linked to interpretivism (Saunders et al., 2008).

Creswell (2003) claims that both deductive and inductive approaches focus on overall statements, but qualitative research goes deeper to examine the specific and distinctive study elements. Hussey and Hussey (1997) defined deductive research as research where development of theoretical structure occurs and is then assessed by empirical observations. This means that specific instances are deducted from general influences. Deductive research is referred to as moving from the general to the specific. Inductive research indicates developing a theory from observing a phenomenon. Thus, general conclusions are drawn from specific scenarios. This is the opposite of the deductive method due to movement from personal observations to general laws and patterns (Hussey and Hussey, 1997).

Deductive theory signifies observation of the nature of the relationship between theory and research. The process sequence moves from theory to hypothesis, data gathering, findings,

then confirmation or rejection of hypotheses and then back to the theory (Bryman 2012).

The inductive research process, on the other hand, begins with the observation and findings and is concluded by building a theory. Figure 3.5 presents the inductive logic of a research project in a qualitative study (Creswell, 2003).

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┌──────────────────────────────────────────────────────────────┐
│   Researcher gathers information (e.g. interviews, content     │
│                        analysis)                              │
└──────────────────────────────────────────────────────────────┘
                              ⇩
┌──────────────────────────────────────────────────────────────┐
│  Researcher asks open-ended questions of participants or      │
│                    records field notes                        │
└──────────────────────────────────────────────────────────────┘
                              ⇩
┌──────────────────────────────────────────────────────────────┐
│     Researcher analyses data to form themes or categories      │
└──────────────────────────────────────────────────────────────┘
                              ⇩
┌──────────────────────────────────────────────────────────────┐
│  Researcher looks for broad patterns, generalisation, or      │
│         theories from themes or categories                    │
└──────────────────────────────────────────────────────────────┘
                              ⇩
┌──────────────────────────────────────────────────────────────┐
│  Generalisations or theories to past experiences and literature│
└──────────────────────────────────────────────────────────────┘
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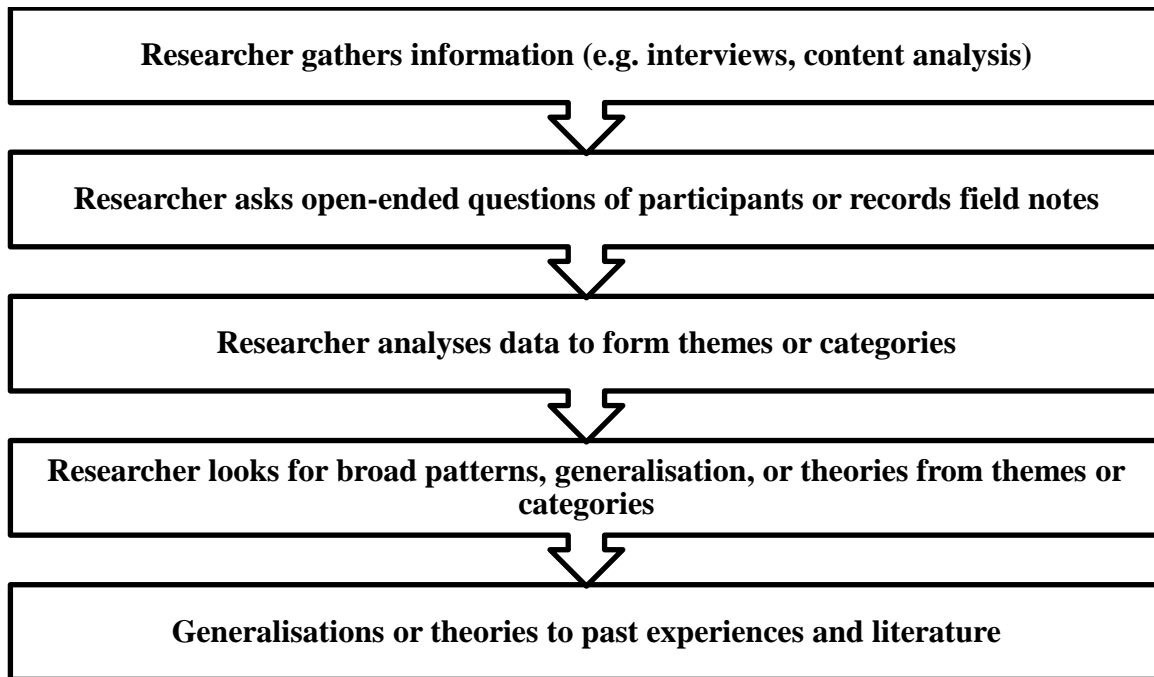
Figure 3.5 Inductive logic; adapted from Creswell (2003, p. 132)

The nature of the research topic and the research questions of the current study require a combination of both the deductive and inductive approaches. Saunders et al. (2008) highlight that it is not only possible to combine the two approaches within the same research, but it is also often advantageous to do so. The first and second research questions are explorative in nature and, according to Saunders et al., they are used to get a feel of what is going on by gathering data through content analysis and interviews, then analysing and forming themes and categories. This implies following an inductive approach.

However, the second research question will require relying on existing theories to test hypotheses, through the collection and analysis of quantitative data. Furthermore, the researcher will be independent of what is being researched as it is a structured process. Therefore, the approach adopted in the study is actually a combination of inductive and deductive approaches. This reflects the adoption of mixed methods as a methodological choice, according to the third layer of the research onion. Both qualitative and quantitative methods are employed, which are possible and highly appropriate within one study (Saunders et al., 2008).

3.4   Research Strategies

Choosing the research strategy can be thought of as the first step in the research design, which is, turning the research question into a research project (Robson, 2002). The second and third steps are research choices and time horizons (Saunders et al., 2008). This section will discuss research strategies employed in this study.

Research strategies can be used for exploratory, descriptive and explanatory research (Yin, 2003). As stated by Saunders et al. (2008), "Some of these clearly belong to the deductive approach, others to the inductive approach. However, often allocating strategies to one approach or the other is unduly simplistic. In addition, we must emphasise that no research strategy is inherently superior or inferior to any other" (p. 141).   Accordingly, it is important to choose a strategy that will lead to answering the research questions and meet the research objectives. Hence, the choice of research strategy should be guided by i) the research questions and objectives; ii) the extent of existing knowledge; iii) the amount of time and other available resources; as well as iv) the philosophical underpinnings

(Saunders et al., 2008). Examples of different research strategies are experiment, survey, case study, action research, grounded theory, ethnography, and archival research. However, it is necessary to keep in mind that these strategies should not be thought of as being mutually exclusive. "For example, it is quite possible to use the survey strategy as part of a case study" (Saunders et al., 2008, p. 141). This is the situation in the current study, where a survey strategy is utilised as part of a case study.

3.4.1 Case Study

Robson (2002) defines case study as "a strategy for doing research which involves an empirical investigation of a particular contemporary phenomenon within its real life context using multiple sources of evidence". Yin (2003) emphasises the importance of context, adding that, "within a case study, the boundaries between the phenomenon being studied and the context within which it is being studied are not clearly evident". This is considered opposite to the experimental strategy, where research is undertaken within a highly controlled context. It also differs from the survey strategy where, although the research is undertaken in context, the ability to explore and understand this context is limited by the number of variables for which data can be collected. Therefore, it would be suitable to use the case study strategy, if the researcher wishes to gain a rich understanding of the context of the research and the processes involved (Saunders et al., 2008).

As a research strategy, the case study is used in many situations to contribute to our knowledge of individual, group, organisational, social, political, and related phenomena (Yin, 2003). Yin (2003) claims that the distinctive need for case studies arises out of the desire to understand complex and social phenomena.

Saunders et al. (2012) state that it is important to note that, "although in some cases researchers associate particular research strategies with particular research philosophies, the boundaries between them are often permeable". Ethnography as a strategy, for example, is associated with both realism and interpretivism. On the other hand, whilst both the experiment and the survey research strategies are normally associated with positivism, they are also used by realist and pragmatist researchers. Similarly, whilst a case study, perhaps of an individual organisation, is often associated with interpretivism, case studies could also be used in positivistic research.

Furthermore, the case study strategy has the ability to generate answers to "how", "what", and "why" questions, although "what" and "how" questions tend to be more the concern of the survey strategy. For this reason the case study strategy is most often used in explanatory and exploratory research (Saunders et al., 2008). Data collection techniques employed in case studies may be various and are likely to be used in combination. According to Saunders et al. (2008), these techniques include, for example, interviews, observation, documentary analysis and questionnaires. The same applies to the current study and will be discussed in detail in Section 3.7, where research techniques and procedures are presented. Consequently, when a case study strategy is employed, the researcher is likely going to need to use and triangulate multiple sources of data.

Triangulation refers to the use of different data collection techniques within one study in order to ensure that the data are telling you what you think they are telling you.

For example, qualitative data collected using semi-structured group interviews may be a valuable way of triangulating quantitative data collected by other means such as a questionnaire. Triangulation will be applied in this study in order to report findings of the data collected using multiple techniques.

Yin (2003) distinguishes between four case study strategies based upon two discrete dimensions i) single case versus multiple case; ii) holistic case versus embedded case. A single case may be selected because it is typical or because it provides an opportunity to observe and analyse a phenomenon that few have considered before. A case study strategy can also incorporate multiple cases, that is, more than one case.

Furthermore, Creswell (2003) defines a case study as "researcher explores in depth a program, an event, an activity, a process, or one or more individuals" (p. 15). Leedy and Ormrod (2001) further require a case study to have a defined time frame. As previously mentioned, the case study can be either a single case or a case bounded by time and place (Creswell, 2003). Creswell (2003) suggests the structure of a case study should be the problem, the context, the issues, and the lessons learned. The data collection for a case study is extensive and draws from multiple sources such as direct or participant observations, interviews, archival records or documents, physical artefacts, and audio-visual materials. The findings of the case study would include lessons learned or patterns found that connect to theories (Creswell, 2003). Saunders et al. (2008) argue that a case study strategy is very worthwhile for exploring an existing theory.

In addition, a well-constructed case study strategy enables the researcher to challenge an existing theory and also provide a source of new research questions (Saunders et al., 2008).

In order to answer the research questions and fulfil the aim of the study, and according to the discussion in previous paragraphs of this section, the case study strategy is selected as the main research strategy for implementing the current research. As mentioned by Saunders et al. (2008), a case study strategy can be used to answer "how" and "what" questions, which is the case with the current study's three research questions. The aim of the study involves exploring and understanding how SNS is being used and what effect it has on educational and social dimensions of students' and faculty's experience in the educational setting, and finding out what challenges it faces and opportunities it has to be a part of the educational experience. Hence, a case study is employed. Therefore, the case study strategy is employed as it is mostly used in explanatory and exploratory research (Saunders et al., 2008). A further reason, stated by Saunders et al., for using a case study strategy is when the researcher wishes to gain a rich understanding of the context of the research and the process involved.

In addition to reasons previously mentioned, a single-case study is selected for the current research due to convenience (Yin, 2003). The opportunity was provided to the researcher by her institution to conduct the research, and collect data from various sources within one of the colleges at the Arab Academy for Science & Technology (AAST) in Egypt, namely the College of Management and Technology (CMT). Hence, the case of AAST CMT will be used in the current study to help answer the research questions.

AAST[1] is a regional academic institution founded in 1972 and operated by the Arab League. It offers various undergraduate and postgraduate degrees through nine different colleges and seven campuses all over Egypt, with Alexandria being the headquarter of the institution. The students of CMT Alexandria are middle/upper class youth, with an age range between 18 and 23. All students must pass an admission test to prove their English language proficiency, unless they are enrolled in the Arabic department, which comprises 27% of the total number of students enrolled in all CMT departments. The vast amount of activity and interaction taking place on the educational Facebook group at the College of Management (CMT) was also a further reason why CMT at AAST was chosen as a suitable case for the study.

Examples of widely used SNS include Facebook, Twitter, and MySpace. Because this study explores the use of a supporting technical tool, it is essentially important that the population under study would accept the utilisation of that tool. Therefore, a significant factor in choosing the SNS to study, apart from technical characteristics, is the popularity of that SNS among students and faculty members. In the current case study, only one SNS is chosen to be explored; this SNS is Facebook. Facebook (FB) is very popular among undergraduate students in Egypt (E-Marketing Egypt, 2016), who represent one of the two main participant groups of this study. Moreover, FB is also one of the major popular SNSs worldwide (Nwangwa et al., 2014).

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[1] http://www.aast.edu

According to Facebook statistics, 1.32 billion users on average were active each day in June 2017 (Facebook Newsroom, 2017), which makes it the most accessed SNS on the Internet today. With 34.5 million users as of early 2017, Egypt is ranked 14th worldwide in terms of audience size, and first among all Arab countries (Salem, 2017).

Facebook in Egypt is a young community; users younger than 35 years old represent about 85% of total users. Based on a survey undergone by E-marketing Egypt, the age group ranging from 19 to 24 years represents 31% of total Facebook users in Egypt; this is the same age group of undergraduate students being studied in this research (E-Marketing Egypt, 2016).

The case study employed in this research will use CMT AAST as the higher education institution setting, its students and faculty members as the main participant groups, and Facebook as the SNS subject of study. The selection of this case study will enable the researcher to validate the hypothesis model and answer the proposed research questions.

Finally, possible limitations of choosing a case study strategy are discussed in Chapter 7, Section 7.9.

3.4.2   Survey

The survey strategy is typically associated with the deductive approach, that is usually used for exploratory and descriptive research (Saunders et al., 2008). The survey strategy is frequently used to answer who, what, where, and how questions. (Saunders and Rojon (2014) claim that the popularity of surveys lies in their ability to allow the collection of a large amount of data from a sizeable population in a highly economical way. This is usually obtained by using a questionnaire administered to a sample; these data are

standardised, allowing easy comparison. Furthermore, the survey strategy is perceived as "authoritative" by people in general and is comparatively easy to explain and to understand (Saunders et al., 2008).

The survey strategy allows the collection of quantitative data that can be analysed quantitatively using descriptive and inferential statistics (Saunders et al., 2008). In addition, the data collected using a survey strategy can be used to suggest possible reasons for particular relationships between variables and to produce models of these relationships. Moreover, using a survey strategy gives the researcher more control over the research process. The data collected by the survey strategy is not as wide-ranging as those collected by other research strategies.

Questionnaires, however, are not the only data collection technique that belongs to the survey strategy. Structured observation and structured interviews, where standardised questions are directed to all participants, also often fall into the survey strategy (Saunders et al., 2008). As previously mentioned, Saunders et al. (2008) state that research strategies should not be treated as mutually exclusive. Instead, a research strategy could complement or encapsulate another strategy. As is the case with the current study, a survey strategy is used as a part of the main adopted strategy, namely the case study. A survey will be used to help answer the second research question, which is deductive in nature.

3.5 Choice of Methods

The current section will discuss the choice of methods used in the study. The study will follow a mixed-methods research choice. Saunders et al. (2008) state that the terms quantitative and qualitative are widely used in research to describe both data collection

techniques and data analysis procedures. Quantitative is mostly used as a synonym for data collection techniques, such as questionnaires, and/or data analysis procedures, such as graphs or statistics, that generate or use numerical data. On the other hand, qualitative is usually used to describe data collection techniques, such as an interview, and/or data analysis procedures, such as classifying and grouping data, that generate or use non-numerical data (Saunders et al., 2008).

"A mixed methods approach is adopted when both quantitative and qualitative data collection techniques and analysis procedures are used in a research design" (Saunders et al., 2008, p. 152). Mixed method research uses quantitative and qualitative data collection techniques and analysis procedures but does not combine them. Although both quantitative and qualitative are used, they are separated in the analysis phase where quantitative data are analysed quantitatively and qualitative data are analysed qualitatively.

Tashakkori and Teddlie (2003) claim that mixed methods provide better opportunities for answering the research questions. One of the main advantages for adopting a mixed methods approach is that different methods can be used for different purposes in the study. In the current study, content analysis and interviews are employed as an exploratory phase in order to "get a feel for the key issues" before the employment of questionnaires to collect explanatory data.

Figure 3.6 lists multiple reasons for using and adopting mixed-method designs studied by Bryman (2006). Bryman (2006) conducted a study of over 200 social science articles in which quantitative and qualitative methods were joined.

His study findings suggest that multiple methods research provides "such a wealth of data that researchers discover uses of the resultant findings that they had not anticipated" (Saunders et al., 2008, p. 154).

Reason	Explanation
Triangulation	Use of two or more independent sources of data or data collection methods to corroborate research findings within a study.
Facilitation	Use of one data collection method or research strategy to aid research using another data collection method or research strategy within a study (e.g. qualitative/quantitative providing hypotheses, aiding measurement, quantitative/qualitative participant or case selection)
Complementarity	Use of two or more research strategies in order that different aspects of an investigation can be dovetailed (e.g. qualitative plus quantitative questionnaire to fill in gaps quantitative plus qualitative questionnaire for issues, interview for meaning)
Generality	Use of independent source of data to contextualise main study or use quantitative analysis to provide sense of relative importance (e.g. qualitative plus quantitative to set case in broader context; qualitative $\times$ quantitative analysis is to provide sense of relative importance)
Aid interpretation	Use of qualitative data to help explain relationships between quantitative variables (e.g quantitative/qualitative)
Study different aspects	Quantitative to look at macro aspects and qualitative to look at micro aspects
Solving a puzzle	Use of an alternative data collection method when the initial method reveals unexplainable results or insufficient data

Figure 3.6 Reasons for using mixed-method designs (Saunders et al., 2008)

An examination of the research methods and research designs employed suggests that on the quantitative side, structured interview and questionnaire research within a cross-sectional design were predominant. The study at hand will use questionnaires to survey

students and collect quantitative data, whereas on the qualitative side, the semi-structured interview within a cross-sectional design tends to be the predominant approach in Bryman's (2006) findings. The current study will also depend on semi-structured interviews as well as content analysis performed in a cross-sectional design.

The current research combines mixed methods since it involves collection, analysis, and a mix of both quantitative and qualitative data as per Creswell and Plano Clark (2007). This mixing of data types can give a deeper description of the phenomena under investigation, as well as offering countering advantages that can offset the weaknesses present in each methodology separately (Creswell and Plano Clark, 2007).

The positivist perspective linked with qualitative research involves the acknowledgment that reality can never be completely captured, but only approximated (Guba and Lincoln, 2002). Therefore, relying on multiple methods is a way of capturing as much of reality as possible, while still discovering and verifying theories.

In mixed methods research, knowledge claims are usually pragmatic (Creswell and Plano Clark, 2007). Pragmatic knowledge claims include both real world "practice-oriented" and "problem-centred" positions. The main purpose for designing mixed methods research studies is to gain a richer, more holistic understanding of the research problem than is possible with single-method research approaches.

3.6   Time Horizons

Saunders et al. (2008) emphasise the importance of deciding whether a research is a "snapshot" taken at a specific time, or is to be a "series of snapshots" taken over a given period of time. The snapshot time horizon is defined as cross-sectional, while the series of

snapshots perspective is defined as longitudinal. Both time horizons are independent of which research strategy or method choice the research is following.

When studying a particular phenomenon at a particular time, the study's time horizon is more suitably cross-sectional. Saunders et al. recognised that most studies that were undertaken for academic purposes are generally time constrained. A survey strategy is often adopted in cross-sectional studies (Robson, 2002). They may be aiming to describe the occurrence of a phenomenon or to explain how factors are related in different organisations. Still, they can also use qualitative methods. Many case studies that are based on interviews are conducted over a short period of time (Saunders et al., 2008).

The current study will be conducted over a cross-sectional time horizon, since the mixed methods will take a "snapshot" of the situation that is happening in one academic semester. For future work, comparisons between semesters can be conducted over a longitudinal time horizon to gain more insight into SNS usage in education.

3.7 Research Techniques and Procedures

This section will thoroughly go through the techniques and procedures employed to gather and analyse data in order to answer the research questions and achieve the aim of the study. Since a mixed-methods design is being adopted, the data collection was conducted over four consecutive stages that are summarised in Figure 3.7. The first stage involves gathering secondary data from interactions taking place on Facebook in the form of discussions and posts shared by both students and faculty members. The rest of the stages are concerned with gathering primary data from students and faculty members through questionnaires, interviews, and focus groups, as presented in Figure 3.7. The following

sub-sections will present and discuss these stages in further detail.
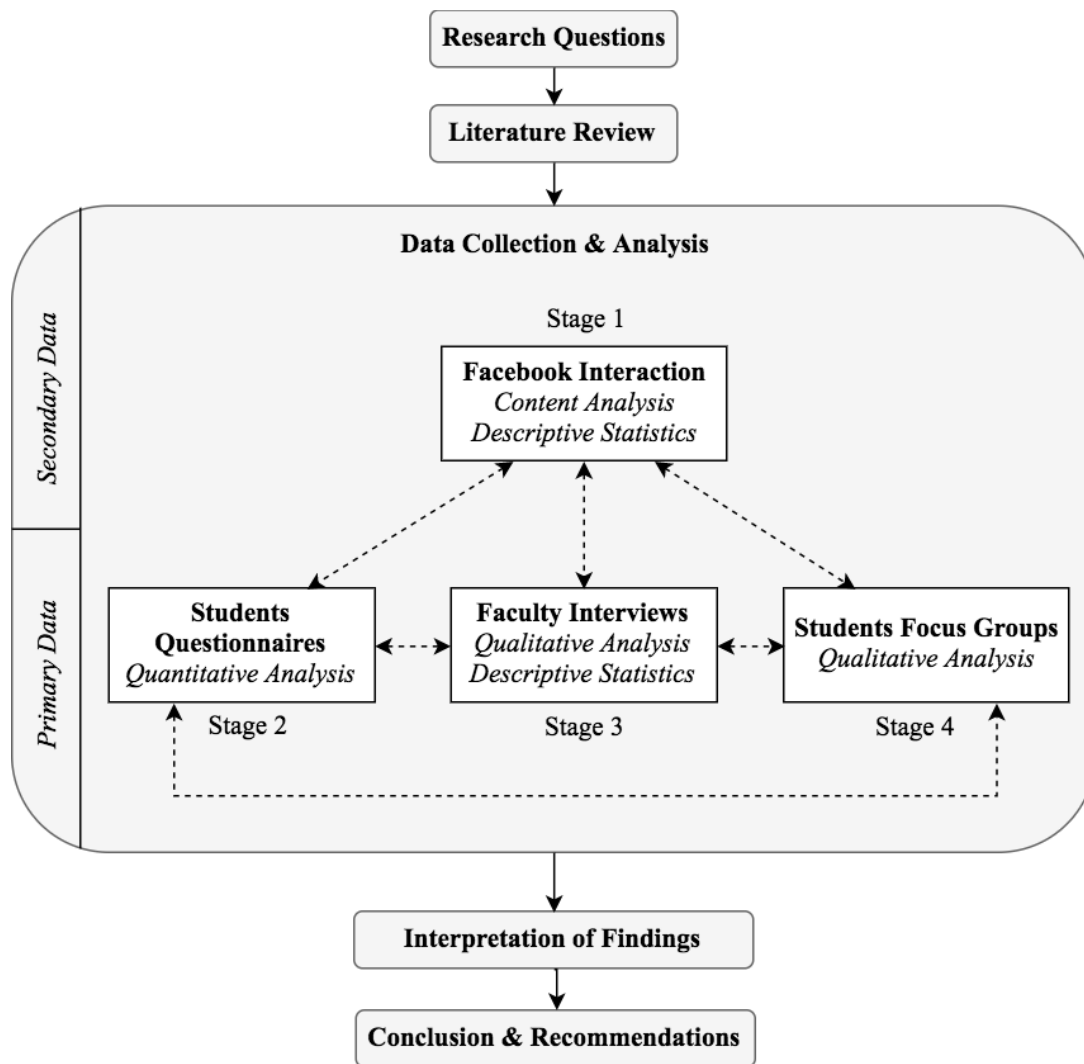
Figure 3.7 Research Stages Undertaken

3.7.1   Secondary Data Collection

Secondary data is defined as information collected from already existing sources. Examples of such sources include manuscripts such as government publications, published books, company records, and findings from previous studies (Sekaran, 2003).

Saunders et al. (2008) emphasise the significance of secondary data as it "fills a need for

a specific reference on some point to demonstrate why the proposed research fills a void in the knowledge base". In the current study, the researcher collected secondary data through a developed web-application that will be further explained in Section 3.7.2.

3.7.2   Developed Web-Based Analysis System

The System Development Life Cycle (SDLC) is a model used to collect all information about a project or a system's development, and the main phases that this project passes through (Johnson, 2000).

SDLC methodology follows four steps; the first step is defining the new system requirements including addressing any deficiencies in the existing system with specific proposals for improvement. This step does not apply on the application developed in this study as the system was planned from scratch and not based on any existing system. The second step is the design of the proposed system. Plans are created detailing the hardware, operating systems, programming and security issues (Coombes, 2001). The third step is the development of the new system; the new components and programmes must be obtained and installed. Users of the system must be trained, and all aspects of performance must be tested. If necessary, adjustments must be made at this stage. The fourth step is implementing the system.
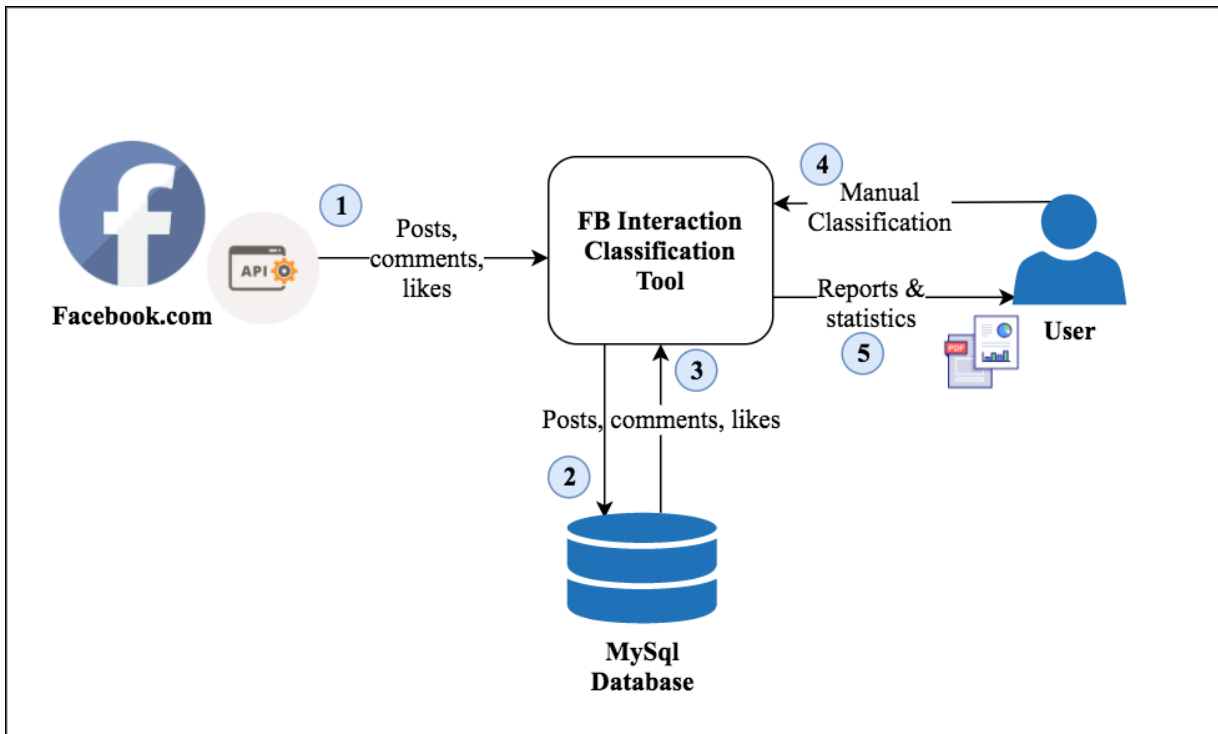
Figure 3.8 FB Interaction Classification Tool

Figure 3.8 presents how the tool web application helps the user in the content analysis of the FB interaction comprising posts, comments and likes.

The initial feature that the system supports is extracting the posts, comments and likes using Facebook's application programming interface (API) from the FB developer tools. The extracted data is then stored in the system database for further processing.

When the user uses the system, all posts and their comment threads and likes appear to the user on the screen. The user can then assign each post or comment to pre-set categories and codes. If the user needs to create a new code, the system offers a feature to create new classifications and codes along the way.

When all stored interaction is classified, the user can run automatic reports to view statistics of all defined categories and the relationships between them.

3.7.3 Content Analysis

Leedy and Ormrod (2001) define this method as "a detailed and systematic examination of the contents of a particular body of materials for the purpose of identifying patterns, themes, or biases" (p. 155). Content analysis reviews forms of human communication including books, newspapers, and films as well as other forms in order to identify themes and patterns. In the first stage of the current research, the source of secondary data to be analysed is collected from discussions happening online on CMTs Facebook group. The method is designed to identify specific characteristics from the content of the human communications. The researcher explores verbal, visual and behavioural patterns, themes, or biases (Leedy and Ormrod, 2001).

Qualitative content analysis comprises the first stage of data analysis of the extracted FB interaction. Content analysis (CA) is the use of a set of procedures in the analysis of text in an effort to make valid inferences about the message, the sender of the message, or the audience of the message (Weber, 1990). It generally involves the statistical analysis of samples of written text, or transcripts of spoken discourse via the application of content analysis software. Content analysis can be used for many purposes including the coding of responses to open-ended survey questions (Fink, 2003a, 2003b; Neuendorf, 2002; Weber, 1990).

The methods of content analysis in research are consistent with the aims and survey standards of the study (Neuendorf, 2002, p. 49). Quantitative CA can be referred to as the

methodical, objective, quantitative examination of message features (Neuendorf, 2002). Contrastingly, qualitative CA, or interpretive analysis, focuses on the evaluation and interpretation of qualitative information, leading to the theory formulation from observation and coding of messages (Fink, 2003a, 2003b; Neuendorf, 2002). Interpretive CA includes sampling of theories, analytical categorisations, cumulative analysis, comparative analysis, and conceptual categorisation of formation (Neuendorf, 2002, p. 6). Overall, it is qualitative in nature, with the analyst being in a constant state of discovery and revision (Neuendorf, 2002). In these features, Interpretive CA can be recognised as corresponding closely with the precepts of qualitative data analysis and qualitative research in general as they are commonly outlined in the literature (Bryant & Charmaz, 2007; Charmaz, 2006; Corbin & Strauss, 2008; Cresswell, 2005, 2007; Denzin & Lincoln, 2008; Strauss & Corbin, 1990; Glaser & Strauss, 1967; Gay, Mills, & Airasian, 2006; Strauss & Corbin, 1997; Glaser, 1978).

Fink (2003a, 2003b) also laid down a strong course for interpretive CA technique application to surveying of qualitative data. Since a qualitative survey often results in a massive amount of information that must be summarised, analysed and interpreted, it is essential to assemble the data into a clean and well-organised database (Fink, 2003a).

Fink (2003b) proposed the following five steps for the content analysis of qualitative survey data, and these steps were adapted for use in the present study i) assemble the data from all sources; ii) learn the contents of the data; iii) create a codebook; iv) enter and clean the data; and finally v) perform the analysis.

Leedy and Ormrod (2001) describe this methodology as a comprehensive and organised scrutiny of the matters of a precise organisation of materials towards identification of patterns, themes, or biases (p. 155). Reviews of content analysis aim to identify human communication such as books, films and newspapers as well as other forms to determine patterns, themes, or biases. This method is planned to ascertain specific features from the human communications content. The investigator is examining verbal, behavioural and visual patterns, biases or themes. The methodical procedure for the content analysis study is intended to attain the maximum objective analysis probable and involves the identification of the body source to be deliberated and defining the features or qualities to be scrutinised (Leedy & Ormrod, 2001). The gathering of data happens in two steps. It starts with analysis of the resources and putting them in a tabulated frequency table where every feature is addressed. Secondly, the investigator must undertake a numerical analysis so that the findings are conveyed in a quantitative layout.

In this study a qualitative interpretive content analysis is administered to develop themes from the interaction taking place on FB between faculty members and students enrolled in their courses, as previously presented in Section 3.7.2.

A further reason for conducting content analysis is that Shea et al. (2011) used the Community of Inquiry framework to evaluate online asynchronous discourse. Aykol and Garrison (2011b) employed transcript analysis to assess cognitive presence in both online and blended communities of learning. Results revealed students achieved high levels of cognitive presence and learning outcomes.

Aykol and Garrison (2011a) further developed content analysis into a metacognition evaluation instrument, where CoI was used as a theoretical framework serving as a conceptual base.

3.7.4 Primary Data Collection

Data can be obtained from two main sources, either primary or secondary, as discussed in Section 3.7.1 (Sekaran, 2006). Primary data collection involves the process through which a study obtains first-hand information regarding the study variables to meet the research purpose. Examples of primary data sources include interviewing, use of questionnaires, focus groups and panels. The current study uses structured questionnaires, interviews and focus groups as sources of primary data, as illustrated in Figure 3.7.

3.7.5 Sampling Techniques

The sampling process is defined as "the selection of part of the population from the area of study. The part population chosen, later becomes the representation of the whole group where the details of interest are assumed to be affecting the whole group" (Sekaran, 2003).

The first stage of the study, i.e. FB group interaction, involves the collection of data that is secondary in nature. The AAST CMT closed Facebook group was chosen for study due to convenience (Yin, 2003). The opportunity was provided to the researcher by her institution to conduct the research, and collect data from various sources within one of its colleges, namely CMT, since the data obtained from the first stage of the study, discussed in the current chapter, is considered secondary data.

Convenience sampling was used to choose the CMT Facebook group as the source of online interactions to be analysed, due to availability and facilitation of access for the researcher.

There are two general types of sampling methods i) probability or representative sampling; and ii) non-probability or judgmental sampling (Saunders et al., 2008). In probability sampling, the chance, or probability, of every case being selected from the population is known and is usually equal for all cases. Probability sampling is most commonly associated with survey-based research strategies where researchers need to make inferences, from the sample, about a population to answer the research questions and to meet research objectives (Saunders et al., 2008).

Since the second stage of the study constitutes a student survey, as previously discussed in Section 3.4.2, probability sampling is employed to collect data from students using structured questionnaires.

In the second stage of the study, structured questionnaires are used to collect data from AAST CMT students, regardless of their academic department. The simple random sampling technique is employed in this stage. It is less liable to bias, where each member of the population has an equal chance to be selected as a respondent. Moreover, simple random sampling allows generalising the sample findings to the original population.

The population of students enrolled at CMT's different departments is 1700 students. Based on a 95% confidence level, the minimum sample size should be 314. To obtain a confidence level of 99%, the recommended minimum sample size should be 478. To collect the highest number of completed and valid questionnaires possible in order to meet

the minimum sample size of 478, 600 questionnaires were disseminated to CMT students. A total of 525 questionnaires were filled in and returned to the researcher.

A confidence level of 99% indicates that, in absence of bias, once the estimate is available, it is possible to be 99% sure that the true population value of the indicator is within the limits of the interval calculated (Garson, 2012).

In the case of non-probability samples, the probability of each case being selected from the total population is not known and it is not suitable for answering research questions that require statistical inferences about the characteristics of the population. It is still possible to generalise from non-probability samples about a population, but not on statistical grounds (Saunders et al., 2008). Non-probability sampling provides a range of alternative techniques to select samples based on the researcher's subjective judgement. Saunders et al. (2008) state that in the exploratory stages of some research projects, a non-probability sample may be the most suitable.

Non-probability sampling is used for selecting the sample of CMT faculty members to be interviewed, and for the students that attended the focus group discussions.

In stage 3 of the study, i.e. the semi-structured interviews with faculty members, the purposive (judgemental) sampling technique was used. This technique allows the researcher to use his/her judgment to select cases that are particularly informative, that help to achieve the research objectives (Saunders et al., 2012). Faculty members who are known for giving time to interact with students on FB were selected to obtain results that would benefit the objectives of the study.

The sample size for stage 3 is 21 CMT faculty members, who use FB to support their course activities and to interact with students. The sample size was reached on the basis of the idea by Hastings and Perry (2000), which recommended that researchers should collect qualitative data until data saturation is reached, i.e. when convergence is achieved in the themes being reported and when there is zero sum gain from conducting more interviews.

Additionally, according to Saunders et al. (2008) the appropriate range of the sample size when conducting semi-structured interviews is between 5 and 25.

In stage 4 of the study, i.e. students' focus groups, the convenience sampling technique is used. Convenience sampling (or haphazard sampling) involves haphazardly selecting the cases that are easiest to obtain (Saunders et al., 2008). Choice of the convenience sampling stems from evidence that numerous previous studies have applied the technique and have reached valid findings (Deng and Tavares, 2013a; Mali et al., 2013; Salmon et al., 2015; Wang et al., 2015).

3.7.6   Structured Questionnaires

The questionnaire is classified into four main sections that are further organised into subsections to measure the various variables. The first section contains all questions about the respondent's Facebook usage, while the second section covers all questions related to the student's educational experience through his interaction on FB. The third section discusses social aspects, and finally, the last section concerns the respondent's personal details. Each section will be discussed in detail in the paragraphs below. A copy of the distributed questionnaire can be found in Appendix A. Research question 2 is to be quantitatively measured through testing the hypothesis in the model shown in Figure 3.9.

The following developed hypotheses are to be tested using the results of the questionnaires' analysis that is thoroughly discussed in Chapter 5.
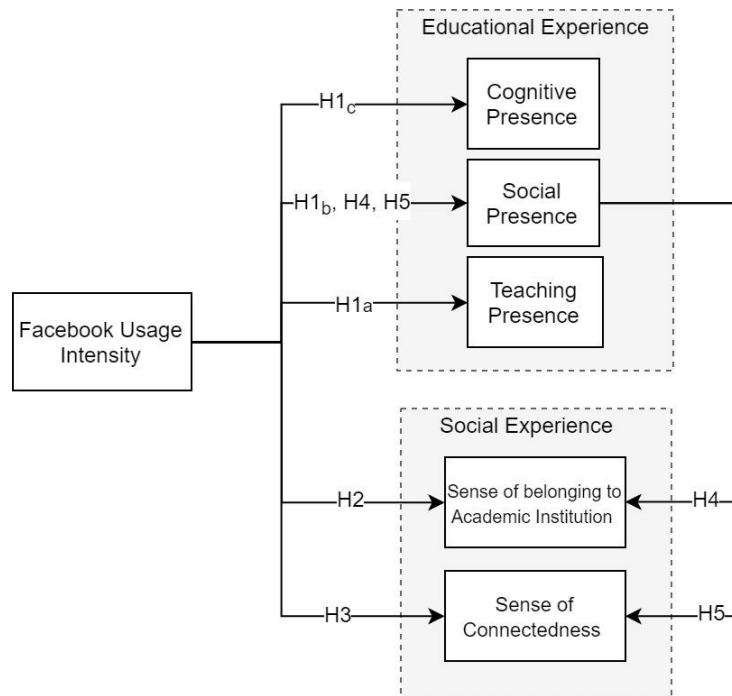
Figure 3.9 Suggested Theoretical Framework

H1$_a$ There is a significant relationship between Facebook usage intensity and the teaching presence of the educational experience.

H1$_b$ There is a significant relationship between Facebook usage intensity and the social presence of the educational experience.

H1$_c$: There is a significant relationship between Facebook usage intensity and the cognitive presence of the educational experience.

H2: There is a significant relationship between Facebook usage intensity and sense of belonging to the academic institution.

H3: There is a significant relationship between Facebook usage intensity and sense of connectedness.

H4: Social presence of the educational experience mediates the relationship between Facebook usage intensity and sense of belonging to the academic institution.

H5: Social presence of the educational experience mediates the relationship between Facebook usage intensity and sense of connectedness.

3.7.6.1 Facebook and Moodle Usage

Facebook usage was measured through the Facebook Intensity scale (FBI) (Ellison et al., 2007), which includes number of friends on FB, time spent using FB, and six (5 point Likert scale) questions about the respondents' emotional engagement with Facebook and integration of the website into their daily lives. This scale ($\alpha=0.86$) has been used in other Facebook research, e.g., Lampe et al. (2011); Tomai et al. (2010); Valenzuela et al. (2009).

Items 11 to 19 cover the nature and preferences of the students' activities on FB for educational purposes such as accessing the CMT FB group for finding and sharing course material, or interacting with other students to answer their enquiries. Questions measure variables such as student participation and privacy. The questions emerged after the content analysis and observation of the interaction that took place online on the FB group. The questions, therefore, were developed as a result of the secondary data analysis.

Items 20 to 27 cover the nature of the Moodle usage and students' opinion of the implementation of its different features as an LMS.

3.7.6.2 Communities of Inquiry

The second section of the questionnaires measures the three presences of the CoI framework. Development and validation of the Community of Inquiry questionnaire was done by a collective study team (Arbaugh et al., 2008). The work of (Arbaugh et al. (2008) gives report regarding the multi-institutional advancement and authentication of an instrument that tries to operationalise the framework by Garrison, Anderson and Archer which is the Community of Inquiry (CoI) (Garrison et al., 2000). Findings of the research prove that the tool is a valid, efficient and reliable measure of the social and cognitive

presence dimensions, thus giving additional backing for the CoI's validity as a framework for construction of effective online learning settings. Factor analysis stood for the idea of teaching occurrence as a paradigm. Its suggestion was also that the paradigm contained two factors - one associated with course scheme and organisation, and the other associated with the coach's behaviour during the course. In the conclusion part, the article gives a discussion of possible implications of deeper enhancement of measures of the CoI for instructors, researchers, administrators and designers.

The CoI model was applied in the research as a tool for measuring the educational experience of students. It was developed by Arbaugh, Cleveland-Innes, Diaz, Garrison, Ice, Richardson and Swan in 2008 (Arbaugh et al., 2008). They examined and analysed a 34-item rating and three sub-factor elements for the development of the scale. Exploratory factor analysis revealed that the scale possessed a structure of 3 and sum variance showed 67.63%. Consequently, as a matter of confirmatory factor analysis, the appropriate index of 34-item and three-factor structure was computed as $\chi2/df=1.74$, RMSEA=0.071, CFI=0.98, NFI=0.96, and NNFI=0.98. The CoI scale's first factor, social presence, contains 9 items, the second factor, cognitive presence, comprises 12 items, and the last factor, teaching presence, involves 13 items. Thus the sum of items is 34 items where the sub-factors are 3. A 5-point Likert scale involves questions that require answers which range from 'Strongly Disagree' with a rating of 1 to 'Strongly Agree' with a rating of 5. Cronbach's Alpha factors mean the internal consistency of scale reliability was 0.97 for the whole scale, 0.90 for SP, 0.94 for CP, and 0.94 for TP.

The CoI model integrates teaching presence, cognitive presence and social presence in describing experience of education (Garrison et al., 2000). The original study by Garrison et al. (2000) was founded on a text-based setting of computer-mediated infrastructures. Garrison's (2011) present CoI model iteration illustrates social presence as open, interactive, and unified communications (p. 25). The focus of the second factor (cognitive presence) is on the intention, procedure, and results of learning (Garrison, 2011, p. 24). Lastly, the teaching presence factor is the integration of instructional strategy, express instruction, and facilitation of both social and cognitive processes in achieving results of learning (Garrison, 2011). A large portion of the prior study on the CoI framework aimed at archival postings of strung boards of discussion. This resulted in numerous investigators adopting qualitative methods (Garrison et al., 2000). Such qualitative methods possessed sample sizes that were limited and sole organisations which prevented the capability to simplify and explore the association present with other variables and the sample sizes (Arbaugh et al., 2008; Arbaugh, 2008).

Using a valid survey instrument coupled with quantitative methodology was necessary in overcoming such setbacks. Garrison et al. (2004) presented an initial quantitative method in examining the elements of CoI with other study variables such as adjusting roles of online learning environments of students in comparison with learning environments which happen face-to-face (F2F). Their belief was that online students are charged with extra roles of learning such as having technology skills, communication management of information from friends and tutors, as well as a mindset of learning anywhere and anytime. By use of factor analysis, their tool of 28 questions validated the structure of the CoI. Arbaugh et al. (2008) also came up with a valid CoI tool by the use of a sample that

was multi-institutional in nature. Their CoI survey, which had 34 questions, was given to approximately 300 graduate students across four institutes in Canada and the US. Factor analysis gave support to the CoI tool for all three essentials of CoI.

3.7.7 Semi-Structured Interviews

Interviews are very popular data collection methods that allow construction of knowledge and exchange of experiences between interviewers and the interviewees (Saunders et al., 2008). This method is used to show the deeper significance of an event. There is less structuring of the qualitative study approach than for the quantitative research approach whose intent is maximising validity and reliability of key concept measurement (Bryman, 2012).

The semi-structured interview, the type chosen in this research, is "a planned and flexible interview with the purpose of obtaining descriptions of the life world of the interviewee with respect to interpreting the meaning of the described phenomena" (Sekaran, 2006). Semi-structured interviews rely on researchers' specific ontological and epistemological positions concerning knowledge and interaction with respondents. In the current study, the interview sessions were recorded, transcribed and translated prior to analysis. The computer software NVivo was used to help analyse the data.

3.7.8 Focus Groups

Focus groups often consist of up to eight participants and their purpose is to obtain data from a social setting where individuals consider their views with regard to the views expressed by other individuals (Creswell and Plano Clark, 2007). Focus groups offer a

more natural setting for the engagement of interviewing, since participants in their settings of learning usually have their views, ideas and attitudes that are affected by other individuals, and in turn they also affect the views of others (Saunders et al., 2008).

These groups are largely known by the way they have been applied by political parties in testing how voters react to certain election policies and strategies, and also through their application in market studies for testing how customers react to product offerings. A focus group, which in other instances is referred to as a 'focus group interview', is a focused group aimed at engaging in a clear interview regarding a certain product offering, issue or service and includes the necessity for discussions that are interactive between the participants (Creswell and Plano Clark, 2007). In comparing focus groups with other forms of group interview, it implies that there is a lot of support and control of the interactions and responses of individual group participants to enhance the focus of the group. Participants are chosen because they possess certain common features that are related to the study topic, and their discussion is encouraged especially in sharing their viewpoints under minimal pressure, which will help the group reach to a point of concession (Krueger and Casey, 2000). Such discussions are conducted several times with similar members, to enable identification of trends and patterns after the analysis of the collected data. The individuals who run a focus group are referred to as the moderators or 'facilitators'. Such labels stress the twin role of the individual running the focus group. The twin role involves a) keeping the group within the limits of the topic under discussion; b) generating interest in the discussion topic to enhance a quality discussion, while trying as much as possible not to lead the group to certain opinions.

Focus groups will be conducted with CMT students to draw upon their attitudes, feelings, beliefs, experiences and reactions in a way that is not feasible using other data collection methods. Focus group interviewing is particularly suitable for obtaining several perspectives about the same topic.

The researcher will use focus groups to complement the two previous methods in triangulation and validity checking. Purposive convenience sampling will be used to target only the students that use FB features in their educational activities, but who are ready and available to attend the focus group. The focus group discussions will be recorded, transcribed and translated prior to analysis. The computer software NVivo will be used to help analyse the data.

Figure 3.10 shows the mapping between the data collection instruments used and the different research questions. Research Question one is answered through the analysis of data collected from the four stages of the study. RQ1 is concerned with how students and faculty view and use SNS in HE institutions. Therefore, stage one of the study, i.e. the findings of the FB interaction analysis, helps the researcher understand the nature of how they use FB in the educational setting of the college FB group. In order to understand how students and faculty members view FB, items 1 to 19 were asked to students through the structured questionnaire (see Appendix A – Form Qa). These include the Facebook usage intensity scale (items 2 to 9) and other questions about the nature of students' FB group and Moodle usage.

Instrument

Research Question
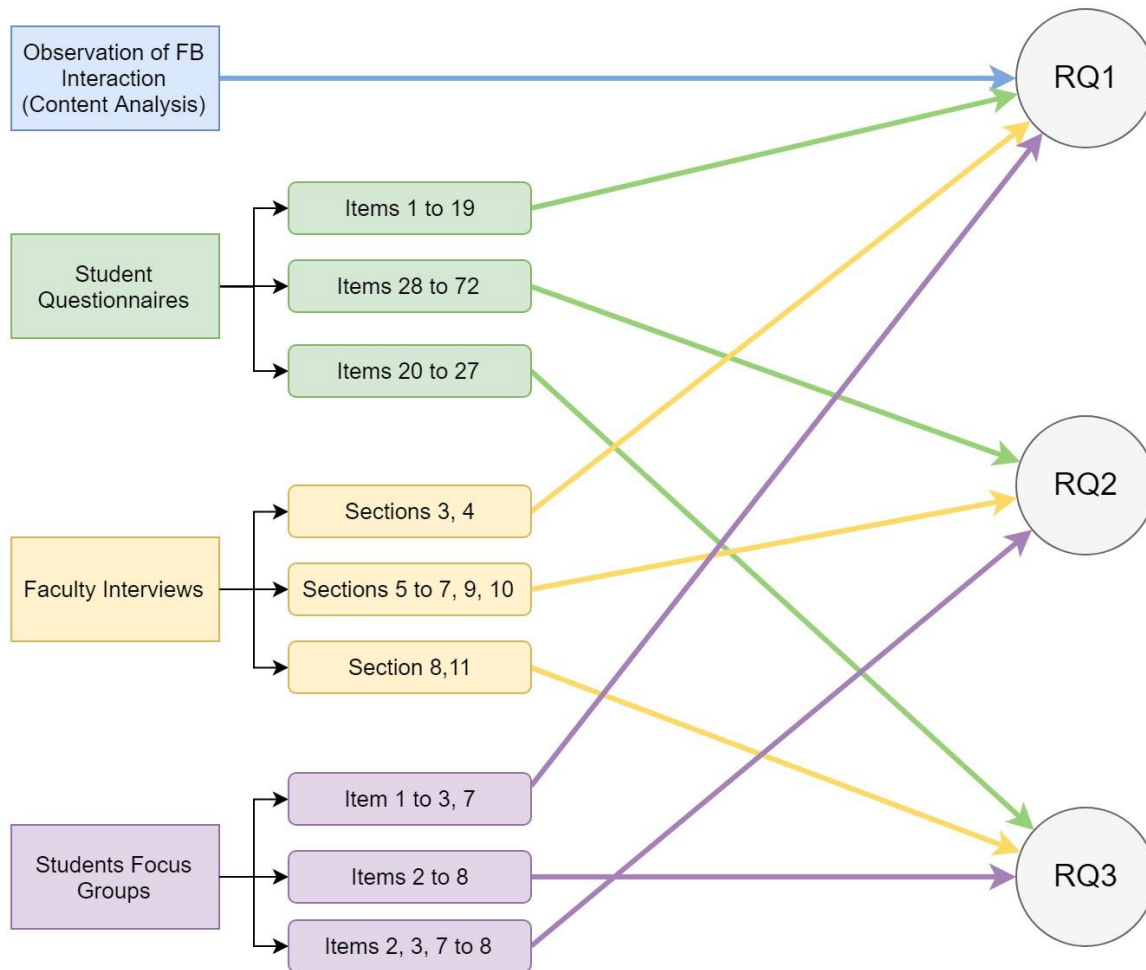
Figure 3.10 Mapping of Data Collection Instruments with RQs

Moreover, findings from questions in Sections 3 to 4 in the faculty semi-structured interviews are also used to answer RQ1 (see Appendix A – Form Ic). The questions include faculty members' perception of their own SNS usage readiness, how they use and perceive CMT's Facebook group and both its advantages and disadvantages.

Finally, items 1 to 3 and item 7 in the students' focus group discussion (see Appendix A – Form FGc), help understand how students view and used FB in parallel with their regular

education activities.

The second research question is considered the main research question of the study and investigates the effect of FBUI on the educational experience measured by the CoI survey, available in Appendix A – Form Qa (questions 28 to 61). For additional investigation of RQ2 through the students' questionnaire, items 62 to 67 measure the sense of belonging to the academic institution through questions of the PSSM scale, and items 68 to 72 are dedicated to measure the sense of connectedness.

Furthermore, questions in Sections 5, 6, and 7 of the faculty members' semi-structured interview, available in Appendix A – Form Ic, explore the CoI's three presences but from the perspective of faculty members to help understand the situation from the instructor's point of view. Questions included in items 9 and 10 further investigate aspects of RQ2 such as the effect of FB usage on students' learning outcomes and their satisfaction with the interaction on FB, when it comes to college-related activities. The students' focus group discussion guiding questions included items that contribute to answering RQ2 as well, namely items 2, 3, 7, and 8. The items are available in Appendix A – Form FGc, and discuss advantages and disadvantages of using FB in learning and college activities. Moreover, the questions try to understand how students think using the FB group affected their educational experience.

The third research question aims to explore and identify the opportunities and challenges that might be faced when using FB in higher education. To answer RQ3, items 20 to 27 in the student questionnaires (see Appendix A – Form Qa) ask questions about the details of FB usage in activities such as interacting with their instructors and classmates, accessing

and organising course materials, and receiving their grades through FB in comparison with CMTs LMS, i.e. Moodle. To understand what the faculty members think of the same aspects, questions in items 8 and 11 were asked during the semi-structured interviews (see Appendix A – Form Ic). The focus groups conducted with students contribute to answering RQ3 by finding out what students perceive as advantages and disadvantages of FB usage in their educational activities, how they compare it to using LMS, and whether they are satisfied with including FB as part of their educational experience. These points are covered by questions 2 to 8 that guided the focus group discussions with students (see Appendix A – Form FGc).

3.8   Credibility of Research Findings

This section will cover issues related to research findings credibility, which in turn can be enhanced by ensuring reliability and validity of the research design. A further aspect that needs to be considered is generalisability, which is sometimes referred to as external validity (Saunders et al., 2008). Generalisability is concerned with the degree to which research findings are equally applicable to different research settings.

3.8.1   Validity

The validity of this study was attained by obtaining member checks, triangulation of data, long-term involvement, and rich data (Maxwell, 2013). Member checks took place when faculty participants were asked to give feedback about the initial interview analysis. After conducting the analysis of the initial interviews, a Word document was created for each of the participants, including an analysis of each of the interviews. Faculty were handed a copy of the analysis with a breakdown of the initial interview themes and interpreted

evidence from their interviews. They were asked to look at the researcher's interpretations and give feedback about the accuracy of the information mentioned, clarify any vague interpretations, and add any missing information (Glesne, 2011).

Validity of the quantitative analysis findings describes the extent to which statements designed in the questionnaire are able to measure what they are supposed to measure, in the correct way (Sekaran, 2006). The average variance extracted (AVE) is used to measure factor validity, which represents the average community for each latent factor, and is applied in the quantitative stage of this study. Hair et al. claim that AVE should be greater than 0.5 to refer to an adequate validity (Hair et al., 2012). The size of loadings of items on their corresponding constructs is also used to test validity. The loadings should be at least 0.40 (Chin, 1998).

Furthermore, the researcher avoided credibility threats in two ways. First, by separating her knowledge of social media tools and her current profession as an instructor from the other faculty members' experiences using social media. During the interviews, several follow-up questions were asked to ensure clarification of data. Second, the researcher analysed each of the data sources individually and sequentially, in order to establish triangulation and to avoid subjectivity.

Triangulation is considered a further validation technique that is applied in this study. There are four types of triangulation in research: method, data, theory, and multiple investigators (Jack & Raturi, 2006). A primary goal of using mixed methods design in this study is the ability to triangulate data; therefore, method and data triangulation was conducted after the data analysis of all methods.

Triangulation of data took place through the use of multiple sources of data: interviews, questionnaires, and focus groups as well as the posts' content analysis.

3.8.2   Generalisability

Generalisability, also referred to as external validity, is concerned with the extent to which research findings are equally applicable to other research settings (Saunders et al., 2008). When a study adopts a case-study strategy, generalisability often falls as a subject for debate. Wikfeldt (2016) defends case studies by stating that the difference in purpose and end goal between case studies and quantitative studies is important to distinguish. To conduct case studies is to attempt the creation of hypotheses (Firestone, 1993; Ruddin, 2006; Woodside, 2010; Yin, 2012) rather than quantitatively stating statistical facts. Cronbach (1975) identified the hypotheses as "working hypotheses" (p.125), meaning that every case study result found will contribute to accepting or denouncing the hypotheses, and possibly to building new ones. Kennedy (1979) says that distinctive case studies will never find a conclusive answer, but will instead only find confirming or disconfirming answers.

While statistical findings are mainly generalised to populations, cases have a tendency to generalise to other circumstances and situations, with the help of in-depth analytic investigation (Yin, 2013). As Yin (2013) says, case studies are not intended to generalise "from samples to universes" (p.18) as, for instance, qualitative surveys are. The claims made when generalising from cases cannot be considered as "proof" in a statistical sense. Rather, they build theoretical premises which function as tools to make assertions about situations similar to the one being studied. Likewise, if further case studies show

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resembling outcomes, they can be said to support the hypotheses and therefore be a part of constructing the theory (Yin, 2013). The phenomenon discussed here is branded with the term "analytic generalisation" (Lincoln & Guba, 2000, p. 112; Yin, 2013, p. 18).

"It is important to realise that non-statistical arguments need not be invalid". That is what Kennedy (1979, p. 664) claims. He further verifies the importance of "single" case studies. An evaluator will pick and choose from multiple cases based on how well they resemble his or her own situation. This is what makes the single case study very valuable (Wikfeldt, 2016).

3.9   Ethical Considerations

In order to protect the rights of the study participants, a consent form was used to ensure confidentiality, anonymity, and security of their participation (Appendix A). If the participants did not agree to the terms in the consent form, they could easily withdraw their participation in the study. Before the commencement of data collection, ethical approval was granted by the Cardiff Metropolitan University ethics committee.

In the secondary data collection phase where FB interaction is extracted and analysed, it was declared to the students on the FB groups that their online interaction would be used for academic research purposes. The posts and comments used were anonymised and handled with confidentiality, and will only be used for academic purposes.

All information obtained in this study is strictly confidential. The results of this research study may be used in reports, publications, and presentations but the researcher has not identified any participants individually or collectively.

3.10 Research Methodology Summary

The research map in Figure 3.11 summarises the research methodology adopted and discussed in Chapter three. The first layer of Saunders et al.'s (2008) research onion (see Figure 3.2) is the research philosophy. To determine the philosophical position of the research, both ontology and epistemology are considered. The ontological stance of the study incorporates both an objective and a subjective view. The epistemology embraced in the research, as shown in Figure 3.11, is a mix of "interpretivism" that is adopted during the FB interaction extraction and analysis, faculty interviews, and focus groups; and "positivism", which is adopted during the survey stage of the study. Saunders et al. (2008) state that "Pragmatism argues that the most important determinant of the epistemology and ontology you adopt is the research question – one may be more appropriate than the other for answering particular questions. Moreover, if the research question does not suggest unambiguously that either a positivist or interpretivist philosophy is adopted, this confirms the pragmatist's view that it is perfectly possible to work with variations in epistemology and ontology" (p.109). Therefore, the mix of the positivist and interpretivist philosophy leads the current research to the adoption of a pragmatism philosophy.
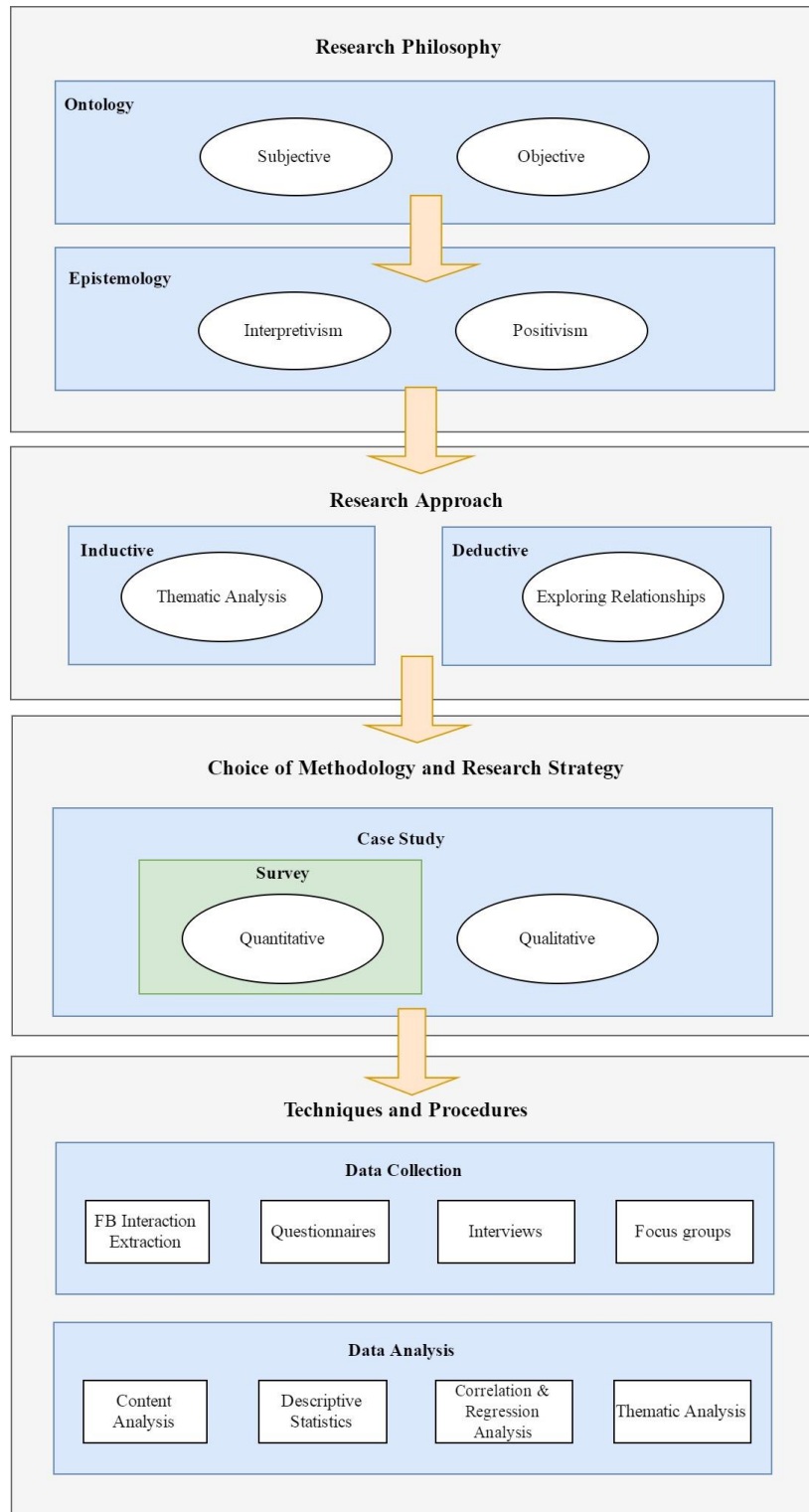
Figure 3.11 Research Methodology Map

The second layer of the research onion is concerned with the research approach (Saunders et al., 2008). The research approach adopted in the study is a mix of inductive and deductive approaches. This reflects the adoption of mixed methods as a methodological choice, according to the third layer of the research onion. Both qualitative and quantitative methods are employed, that are possible and highly appropriate within one study (Saunders et al., 2008).

The fourth layer of Saunders et al.'s (2008) research onion is the research strategy. The strategy employed is a case study strategy that includes a survey strategy as part of it, as previously discussed in Sections 3.4.1 and 3.4.2.

The time horizon of the current study is "cross sectional", where data is collected once, over a short period of time, before it is analysed and interpreted (Saunders et al., 2008).

The fifth layer that acts as the core of Saunders et al.'s (2008) research onion is the "techniques and procedures" layer that is concerned with the data collection and data analysis methods. Since mixed methods are being employed, data is collected through Facebook posts extraction, questionnaires, interviews, and focus group discussions. Data is later analysed through content analysis, descriptive statistics, correlation and regression analysis, and finally, triangulation of findings from all data sources is applied.

Chapter 3 presented the design of the study including the basis for the approach taken, namely mixed methods, and the methods of data collection and analysis. The research design is followed by a description of the methods and procedures employed for the collection and analysis of quantitative and qualitative data, which will be reported and discussed in Chapters 4, 5 and 6.

Chapter 4 – Facebook Group Content Analysis and Findings (Stage 1)

The data analysis of this study is classified into 4 stages of analysis as displayed in Figure 4.1 below. The current chapter will discuss stage 1, while the consecutive stages, namely stages 2, 3 and 4, will be presented in Chapters 5 and 6.

1. Content analysis of the Facebook group interaction	2. Analysis of the students' structured questionnaires	3. Analysis of the semi-structured faculty interviews	4. Analysis of focus groups
• Descriptive Statistics • Qualitative Analysis	• Descriptive Statistics • Quantitative Analysis8	• Descriptive Statistics • Qualitative Analysis	• Qualitative Analysis
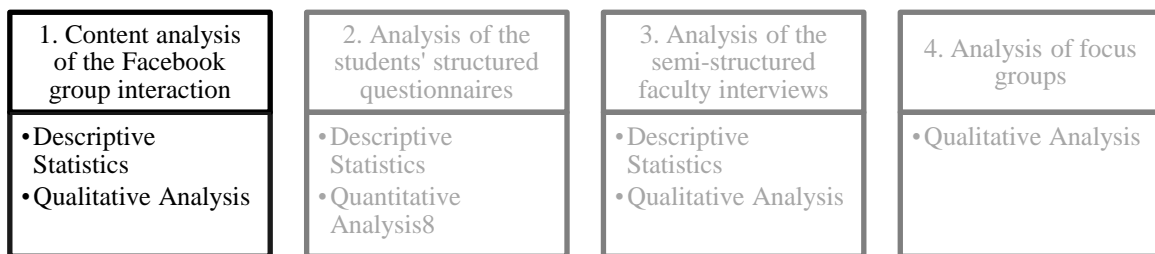
Figure 4.1 Stages of data analysis

4.1 The Closed Facebook Group

Stage 1 of the study analyses the use of a closed Facebook group created for the Student Union of the College of Management and Technology at the Arab Academy for Science and Technology in Alexandria, Egypt. This Facebook group was initially created in March 2011 by the college administration to notify students of important general announcements. The administrators of the group were all college staff members at that time. Currently, the group administrators include both staff members and member students of the CMT Student Union.

The closed Facebook group was chosen for study due to convenience (Yin 2003). The opportunity was provided to the researcher by her institution to conduct the research and collect data from various sources within one of its colleges, namely CMT.

The vast amount of activity and interaction taking place on the educational Facebook group at CMT was also a further reason why CMT at AAST was chosen as a suitable case for the study. The researcher is authorised to administrative privileges on the group, which facilitated access to all interaction and communication taking place on the group, as well as technical privileges for using the Facebook API for posts and comments extraction.

Since the data obtained from the first stage of the study, discussed in the current chapter, is considered secondary data, convenience sampling was used to choose the CMT Facebook group as the source of online interactions to be analysed, due to availability and facilitation of access for the researcher.

Using the classification in Mouton's map of research designs (Mouton, 2001), the methods used in this stage of the study are a combination of qualitative content analysis of the posts and quantitative descriptive statistical analysis of the dataset (Prior, 2008).

The purpose of using the Facebook group within the college community has evolved over the four years since it was first created. This study analyses the posts and interactions that happened within the group during the Fall and Spring semesters of the 2015/2016 academic year. Since the Facebook group is a closed group, the researcher was granted administrator permission to have access to content and advanced controls in the group.

On Facebook, users can perform three actions on each post: like, comment, and share

(Taylor and Alonso, 2014). The group studied in this research is closed only for members' participation and did not allow the option of sharing posts, therefore the data collected only includes the post content, with all its details including number of likes, and the comments that it received.

The Facebook group was initially created in March 2011 by the college administration to notify students of important general announcements. The administrators of the group were all college staff members at that time. Currently, the group administrators include both staff members and member students of the CMT Student Union. The administrators are responsible for approving the addition of new members and monitoring language and content to ensure it is relevant to the purpose of the group.

The Facebook group is neither course-specific nor department-specific. The members of the group include students from the seven academic departments of the College of Management who were enrolled in the more than 282 courses offered that semester.
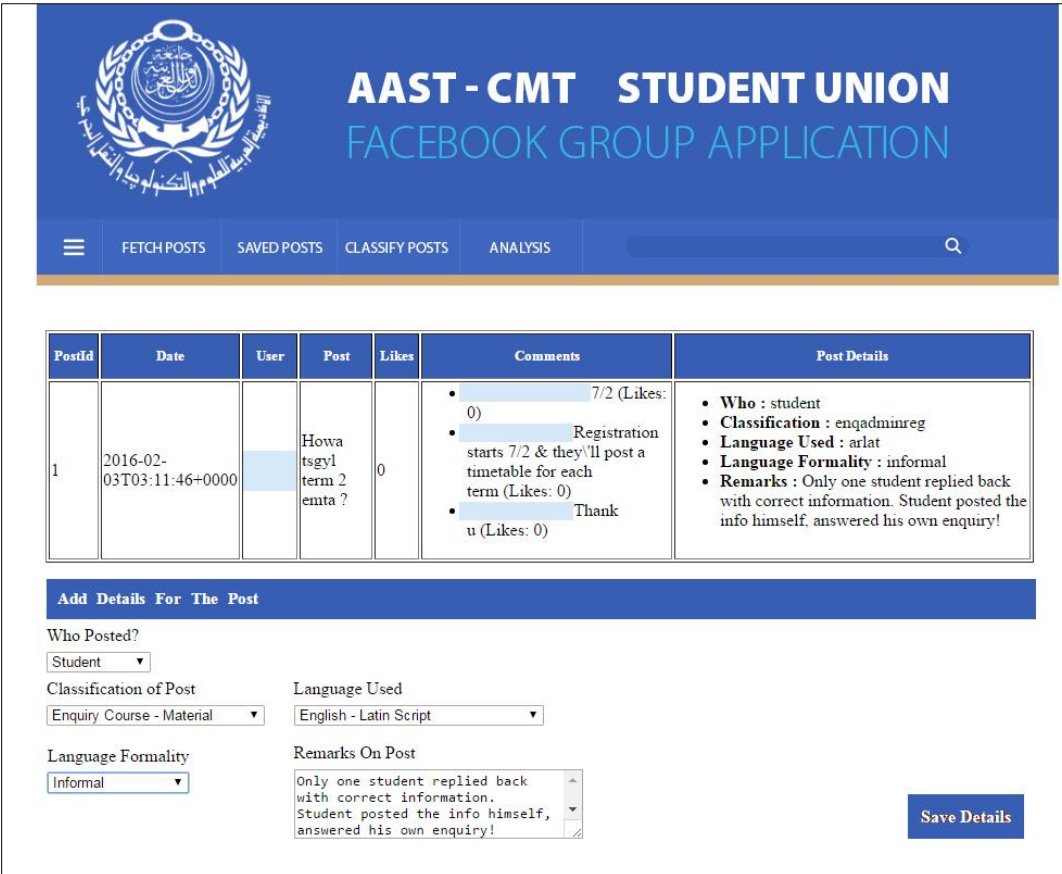
4.1.1 The Web Application

A web-based application which uses the public Facebook Graph API was developed to retrieve all the posts and comments that took place on the group page, starting at the end of September 2015 and ending in June 2016 (two academic semesters). The posts were then saved in a database and later analysed to reach the research findings.

In addition to the post content itself, information such as the number of likes and the name of the user who posted were also extracted from Facebook and stored in the database.

To prepare the dataset for analysis, the application helps add descriptive attributes to each post and each comment.

Attributes were used to describe each post i) who made the post; ii) classification of the content of the post; iii) language used in the post; and iv) feedback on the post. Additionally, special remarks were added to each post to further describe its content and the feedback it received, as shown in Figure 4.2.

Figure 4.2 Screenshot of post classification page

4.1.2 Ethical Considerations

Ethical clearance was obtained from the college's research ethics committee before starting the study. A disclaimer was posted on the group to notify all members that the content posted during the semester was subject to academic research. All information and identities were to be kept anonymous and any member was given the right to withdraw his participation and actions from the study.

4.2 Who Posts on the Group

A total of 1344 posts and 4580 comments on these posts were collected. After classifying the posts according to content, the role of the user who posted, and the feedback and number of likes, the following analysis was conducted.
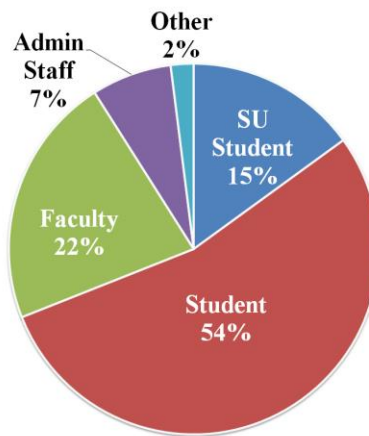
Figure 4.3 Users who posted on the group

As shown in Figure 4.3, the largest number of users who posted on the group was students and Student Union members (SU students), with a total of 69% of the collected posts. This was followed by faculty and instructors, representing 22% of the total posts for the semester. The administration staff represented only 7% of the total announcements. Some

advertisements were also allowed to be posted on the group by approved training centres and AAST institutes outside CMT.

4.3   Posts Classification

After the posts were reviewed, classifications shown in Figures 4.4 and 4.5 were created to describe the content of the posts. Two major notification types were classified: enquiries and announcements. These two classifications were further grouped into sub-classifications according to the occurrences found in the post content.

The third frequently used classification was sharing of academic content by students and faculty. Students shared content to help each other before exam times, and some interesting posts were extracted where students took pictures of their handwritten notes and posted them on the group. Faculty also shared course material files such as PDFs, PPTs and video tutorials.

Other types of posts were also identified, such as student complaints, condolences on the occasion of death, and some advertisements posted by entities and other institutes in AAST (e.g. Graduate School of Business, AAST Alumni).

Figure 4.4 illustrates the classification of announcement posts into six main categories. The first category is "course-specific" announcements that are related to faculty or students enrolled in the same course sharing course material or announcing changes in schedule or class locations. Moreover, some faculty members post exam results of courses they teach, which will be further investigated and discussed in the following chapters. The second category is announcements related to "Exams" and these are usually college-wide announcements regarding exam schedules and locations. Announcements indicating that

grades or results are available at a faculty's office or on the LMS are also included in this category. The third category is concerned with "admin" announcements such as vacation and registration dates, as well as posts related to tuition fees or payments. The fourth category includes all posts related to the Student Union activities, and the fifth category involves any announcement of events or college trips and leisure activities. Finally, the last category includes general posts that do not belong to any category mentioned above.
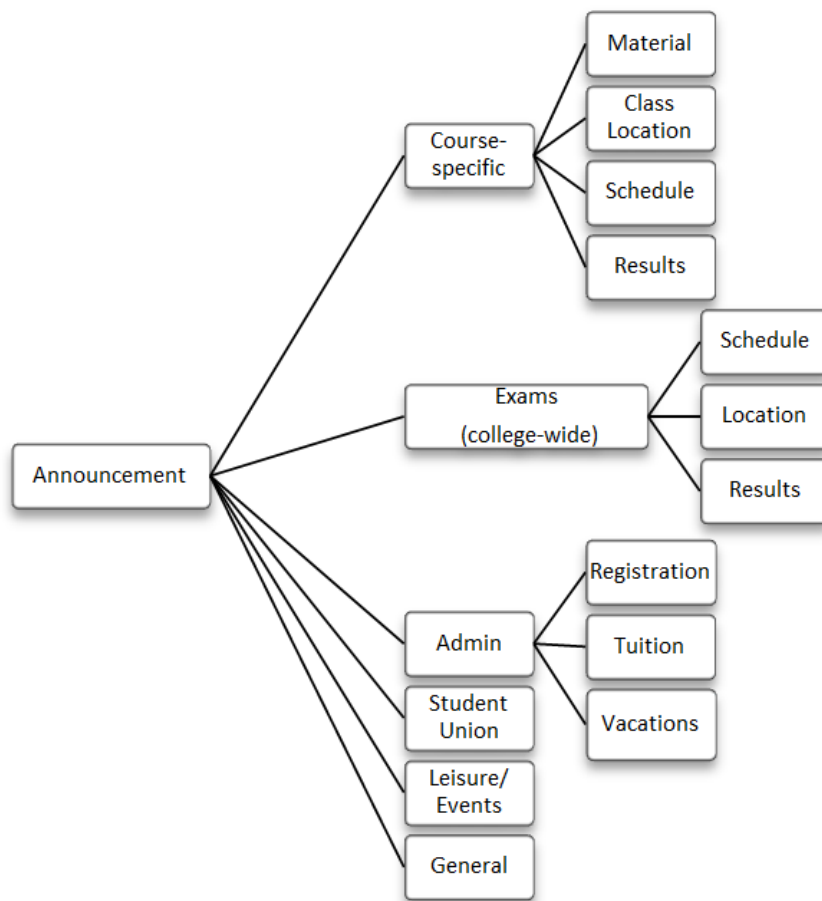
Figure 4.4 Classification of posted announcements

Figure 4.5 illustrates the classification of all enquiry posts that consists of four categories. Enquiries posted on the group were either course-specific, exams-related, admin-related, or general enquiries. In course-specific posts, students would enquire about course material, class locations or changes in schedule, as well as grades and results-related enquiries. In exams-related posts, students asked about exam schedules, location and college-wide results related enquiries. Admin-related enquiries included registration, tuition and vacations. Finally, general enquiries included any general question or request by students or other members of the group.
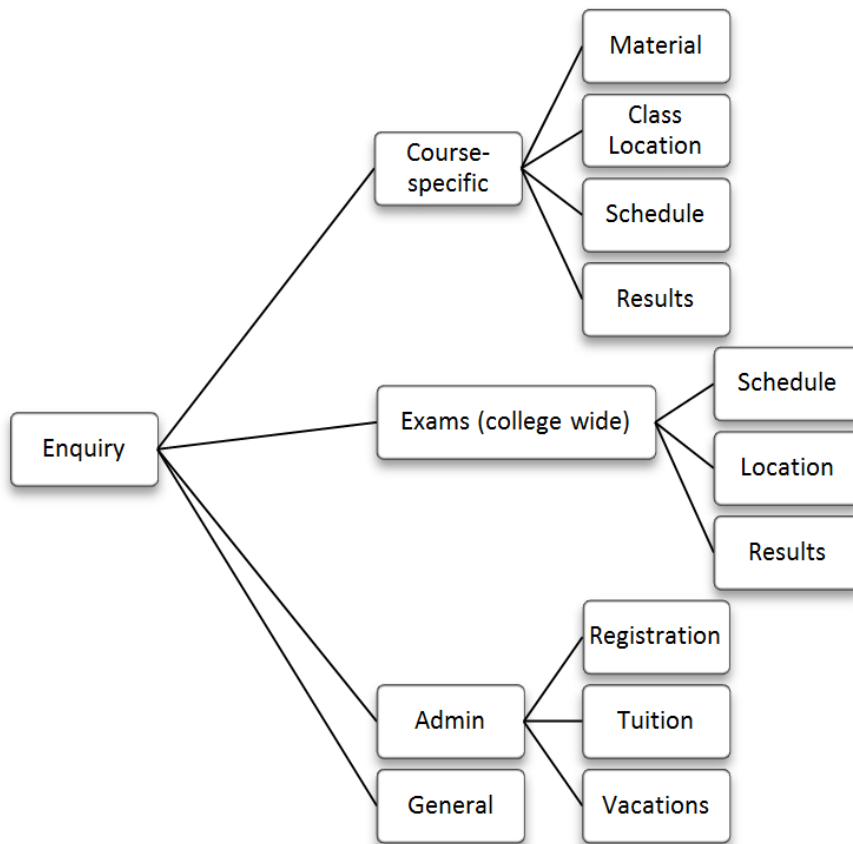
Figure 4.5 Classification of posted enquiries
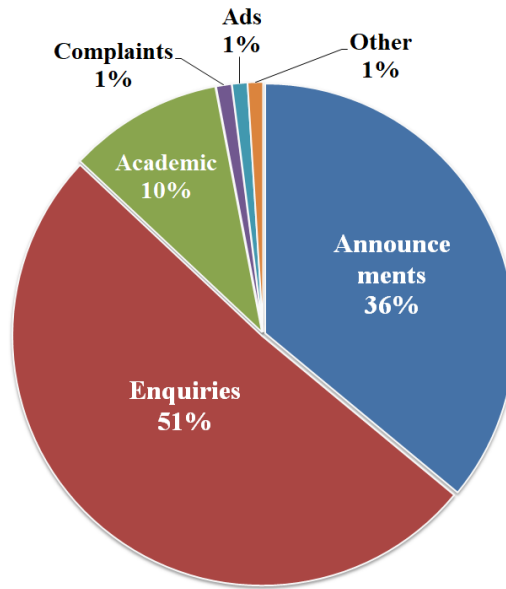
Figure 4.6 Post Types

The highest post type used on the group was enquiries (51% of total posts), followed by announcements (36%), as shown in Figure 4.6. Students posted 97% of the total enquiries, whereas the announcements were posted by faculty members, Student Union members and administration staff. The term "Good Luck" occurred in a total of 37 faculty posts before exam times, to encourage them, and received a high number of likes relative to the average of the total posts by faculty members. It was detected that the rate of new posts being added to the group increased during specific time periods.
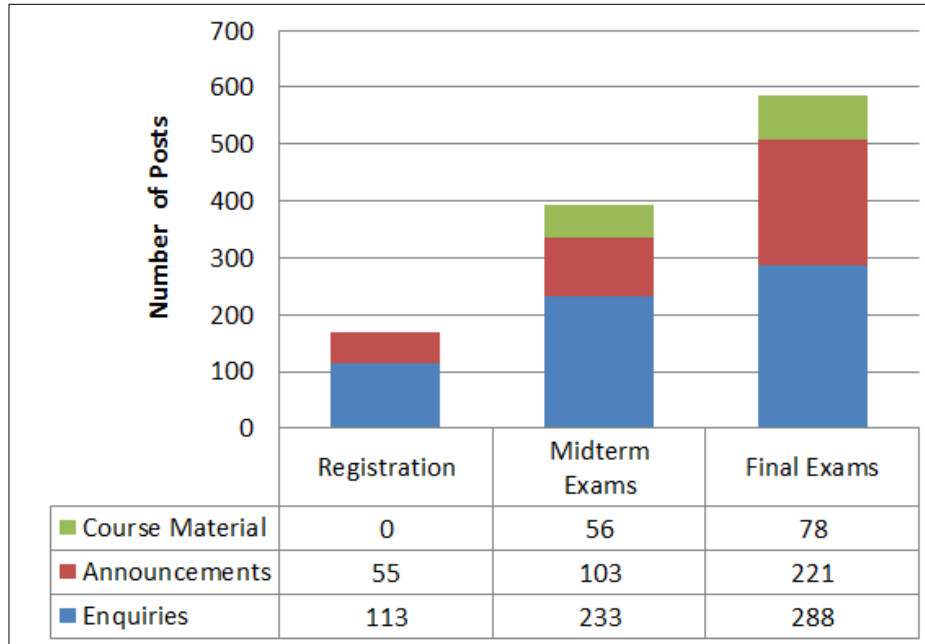
Figure 4.7 Post types during academic calendar highlights

After further investigation, Figure 4.7 shows that academic calendar highlights were the reason behind the high rate of posting.Posts were grouped according to the time span of the academic calendar highlights. The highest percentage of post types consisted of enquiries, followed by announcements, and shared academic material during exam times. Examples of student enquiries during exam times are asking about exam schedules, chapters included in exams, and asking about grades. Announcements during exam times were made by faculty, Student Union members and administration staff regarding schedules, exam rooms, and course content covered in exams. Furthermore, course material was shared by faculty and students. During registration time, the enquiries were all posted by students to ask about course availability, tuition payment and semester starting dates.

4.4   Language Used

Out of the total number of students enrolled in CMT at the time of the study, 99% were native Arabic speakers, which was reflected in the language of the discussions on the group page. The language used in the posts was classified into English and Arabic, or a mix of both. As presented in Figure 4.8, language was further classified according to the script used for writing. In Arabic and mixed English/Arabic posts, members of the group would either write in Latin or Arabic letters, or a mix of both. A reason why the web-application implemented for the classification had to include a human factor for manual interpretation and classification, is the difficulty of automatically processing Arabic language that is transliterated into Latin letters (Al-Onaizan and Knight, 2002). This issue is further discussed in the "directions for future work" section of Chapter 7.
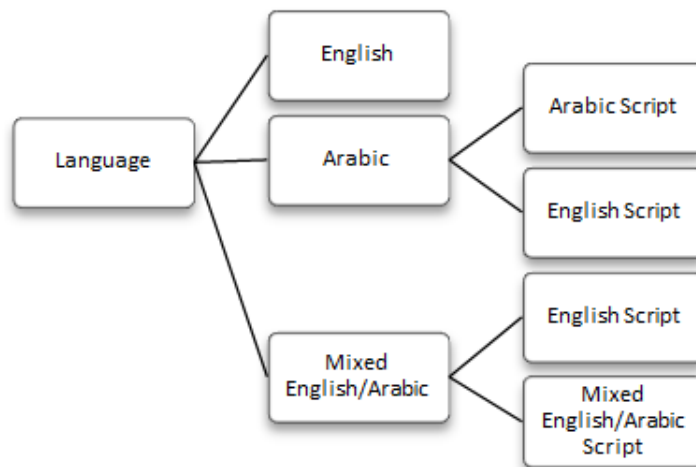
Figure 4.8 Classification of language and script used

Figure 4.9 shows that the highest number of posts are those written in a mix between English and Arabic text in Latin script; this dual language was used in 92% of the enquiry posts made by students. 31% of the posts were written in English using Latin script, mostly by faculty and SU students in official announcements. 14% of the posts were written in the Latin transliteration of the Arabic language with no English words included.

As presented in Figure 4.9, 7% of the posts were fully written in Arabic using the Arabic script. Those posts were almost all announcements posted by faculty or staff members in the Arabic department of the CMT that were directed to the enrolled students.
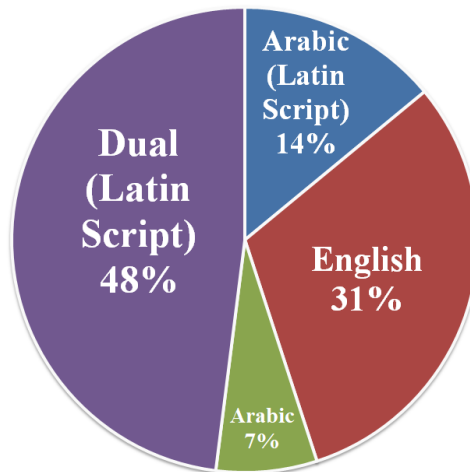
Figure 4.9 Languages and scripts used in posts

4.5 Discussions and Feedback on Posts

A total of 4580 comments was extracted and added to the database to represent the feedback on the posts, along with the number of likes, which could also be extracted using the Facebook API.

4.5.1   Comments

The average number of comments on all the posts in the dataset was 3.4 per post, but not all posts had users comment on them. The posts were classified into seed and non-seed posts (Rowe and Alani, 2014), the seed posts being those that have developed a thread of comments and discussions, and the non-seed posts being those which have failed to attract engagement from the group members. Interestingly, only 41% of all posts were seed posts, while the rest were non-seed posts. An example of a seed post that gathered one of the highest numbers of comments is when the campus had to close due to bad weather conditions and the responsible faculty member posted that the following day's classes were cancelled. The post was written in both English and Arabic, and the Arabic language text included some sense of humour.

Post exclusivity has also been found to have an effect on the post feedback; the post with the highest number of comments was posted by a student who had an exclusive announcement. The same content was posted later three times but did not receive the same amount of feedback.

The comments on enquiry posts were analysed and classified into positive and neutral feedback, where positive feedback included helpful information that answers the enquiry and neutral feedback did not really help with answering the enquiry. Interestingly 83% of the comments on enquiries were positive feedback comments that helped students by giving them either the solution or answer to their enquiries or helped lead them to it, e.g. tagging friends who had answers.

4.5.2   Likes

The 'like' feature on Facebook allows users to press the 'like' button, either on a post or a picture or a comment, which signifies that a user liked that particular content. In the dataset, the average number of likes on posts was 2.5 and the average number of likes on comments was 0.7. The types of posts with the highest average number of likes were announcements, such as exam schedules or exam results. Figure 4.10 shows a scatter chart of the number of likes and the number of comments each post in the dataset received. The correlation coefficient was r=0.552, which indicates a low positive correlation between the number of likes and the number of comments on each post. The post with the highest number of likes, 239, was a video shared by a student after the graduation projects presentations. The student shot a video including all his friends and all students of the marketing department who were presenting that day. The post received the highest number of likes because everyone could see themselves in the video and the students were proud of their work. The same post received a total of 43 comments, of which 40 were students tagging their friends.
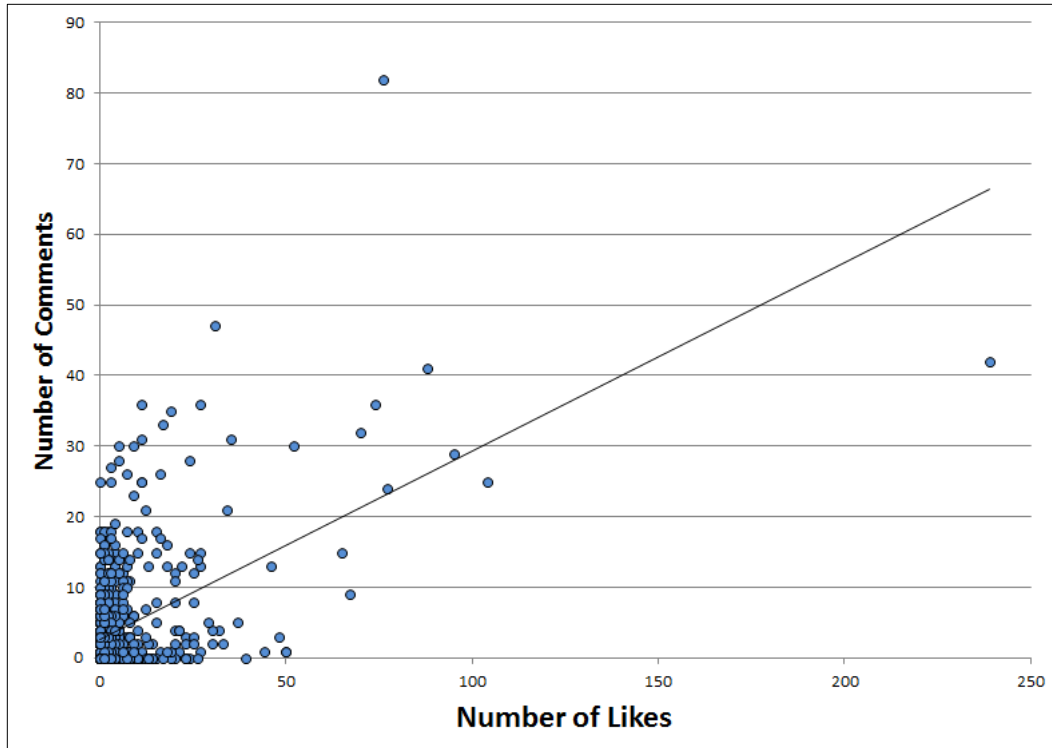
Figure 4.10 Likes and comments on posts

4.5.3   Tagging

The tagging feature in Facebook allows users to add the name of another user in a post or a comment, so that the tagged user understands that the posting user wants him involved in that specific topic.

Tagging was used in 87% of the comments, where students tagged their friends, or tagged certain faculty members, when they either needed them to answer an enquiry or felt that they needed to notify them with the information being shared in a specific post.

Faculty members explicitly asked the students to tag their classmates in 21 occurrences, i.e. when they posted important and urgent announcements. Two posts by students also included a request to tag the teaching assistants, in urgent enquiry posts. On Facebook it is

only possible for someone to tag someone who is already on their friend list, hence the need for the tagging request in the posts.

4.6 Summary

After analysing the content of the posts and comments and discussions, as well as all the descriptive data and classification, it is suggested that a group on a SNS can act as a variety of interesting platforms for interaction in higher education institutions. A study by Mbodila et al. (2014) on the effect of social media on students' engagement, recommended that in order to communicate effectively with students, higher education professionals must embrace new technologies and explore opportunities to implement a social media presence; this is what was taking place on the CMT closed Facebook group. The interaction between the members of the group allows us to conclude that SNS can help the higher education communities outside interact by acting as a i) notification centre; ii) question and answer platform; iii) student affairs portal; and iv) learning management system.

The group acted as a notification centre where announcements were made about all activities that can happen on a college campus. It was used for information sharing between students, as well as between students and faculty and college admin staff.

Furthermore, the group represented a question and answer platform where students could enquire about anything related to their studies, courses and exams. They were either answered by other students or by faculty and staff members. This created engaging collaboration between students, outside the boundary of a specific course or educational setting.

The student affairs administration staff used the group to share information and announcements; students also used it for their student affairs-related enquiries.

10% of the total collected posts were shared academic content of different courses, either by students or by faculty members. Moodle (Deng and Tavares, 2013b) has been used by CMT as a learning management system (since 2009) for all courses in course material sharing, assigning submissions etc. Despite this fact, it was interesting to observe that both faculty and students preferred to use the Facebook group as the means of material sharing.

Interesting implicit interaction was detected when students used the Facebook tagging feature to tag their friends on important notification posts. After seeing the tag, the friends often liked the comment that included the tag, as confirmation that they were aware of the announcement of the post. This was possible due to the tag and like features provided by Facebook, and occurred in 81% of the total posts announced by faculty and staff members.

Although the frequency of their appearance was relatively low, emojis (Stark and Crawford, 2015b) found in posts and comments did sometimes hide implicit meanings such as sarcastic smiles, or convey a message without actually typing it in text. The use of emojis could be further investigated in future work.

4.7 Limitations

It is inevitable that interaction on the group continues after the dataset was collected, and more likes and comments are added by the users. This results in extended discussions that could not be included in the dataset because they did not exist at data collection time. In March 2013, Facebook announced a new feature (Facebook, n.d.) that enables the users to directly reply to specific comments left on any post instead of generally replying to the

post. This feature makes it easy to keep relevant conversations connected, but when the comments in our study were collected, there was no differentiation between comments on a specific post, and comments replying to a specific comment on that post. All comments were treated equally in our study.

Chapter 5: Quantitative Data Analysis & Findings (Stage 2)

The current chapter presents the detailed quantitative analysis and interpretation of findings from the questionnaires that were distributed on CMT students as the second stage of the study as shown in Figure 5.1.

1. Content analysis of the Facebook group interaction	2. Analysis of the students' structured questionnaires	3. Analysis of the semi-structured faculty interviews	4. Analysis of focus groups
•Descriptive Statistics •Qualitative Analysis	•Descriptive Statistics •Quantitative Analysis	•Descriptive Statistics •Qualitative Analysis	•Qualitative Analysis
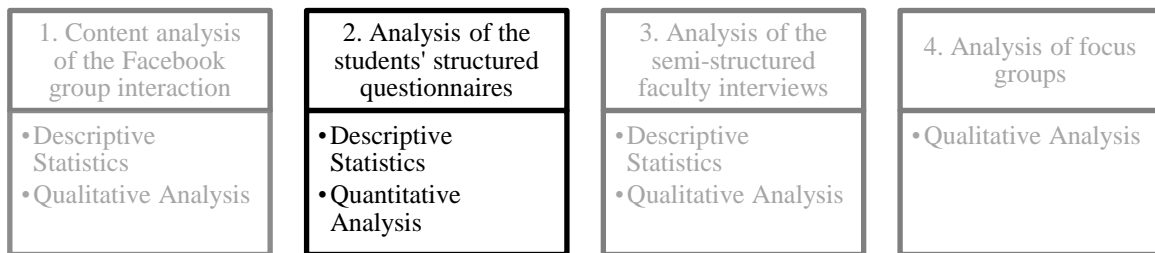
Figure 5.1 Stages of Data analysis

The following section will present the data testing process by testing validity and reliability of the data under study. Afterwards a descriptive analysis will be provided using frequency tables, mean and standard deviation. Finally, the research hypotheses will be tested using correlation and regression analysis.

5.1   Data Testing

The current section presents the validity and reliability tests that were undertaken. Validity describes the extent to which the statements designed in the questionnaire are able to measure what they are supposed to measure, in the correct way (Sekaran, 2006). The average variance extracted (AVE) is used to measure the factor validity, which represents the average community for each latent factor. Hair et al. claim that AVE should be greater than 0.5 to refer to an adequate validity (Hair et al., 2012). The size of loadings of items on

their corresponding constructs is also used to test validity. The loadings should be at least 0.40 (Chin, 1998).

Reliability refers to the internal consistency between statements of one factor and is tested using Cronbach's alpha, which is considered the most commonly used test of reliability. The Alpha coefficient ranges from 0 to 1; the higher the score, the more reliable the generated scale. When Alpha coefficients exceed 0.7, this would refer to an adequate reliability (Hair et al., 2012).

Table 5.1 shows that all AVEs and factor loadings are beyond the cut-off values, which means that the validity is within the acceptable level. Moreover, the reliability scale of Cronbach's alpha exceeds the cut-off value of 0.7, which means that the data is ready to perform the required analysis.

Table 5.1 Reliability & validity tests

Variables	AVE	Items	Item Loading	Cronbach's Alpha
Facebook usage Intensity	72.411%	Q4 (FBI1)	0.789	0.923
		Q5 (FBI2)	0.695	
		Q6 (FBI3)	0.768	
		Q7 (FBI4)	0.795	
		Q8 (FBI5)	0.729	
		Q9 (FBI6)	0.568	
Teaching Design	72.015%	Q28 (TD1)	0.780	0.869
		Q29 (TD2)	0.719	
		Q30 (TD3)	0.686	
		Q31 (TD4)	0.696	
		Q32 (TD5)	Deleted	
Teaching Facilitation	78.467%	Q33 (TF1)	0.742	0.931
		Q34 (TF2)	0.844	
		Q35 (TF3)	0.806	
		Q36 (TF4)	0.764	
		Q37 (TF5)	0.767	
Teaching Direct Instruction	75.571%	Q38 (TDI1)	0.667	0.838
		Q39 (TDI2)	0.797	
		Q40 (TDI3)	0.804	
Teaching Presence	81.096%	TP1	0.767	0.883
		TP2	0.834	
		TP3	0.832	
Social Affective Expression	82.762%	Q41 (SA1)	0.849	0.895
		Q42 (SA1)	0.834	
		Q43 (SA1)	0.800	
Social Open Communication	82.021%	Q44 (SOC1)	0.806	0.927
		Q45 (SOC2)	0.854	
		Q46 (SOC3)	0.863	
		Q47 (SOC4)	0.757	
Social Group Cohesion	87.125%	Q48 (SGC1)	0.871	0.852
		Q49 (SGC2)	0.871	
Social Presence	83.122%	SP1	0.858	0.898
		SP2	0.833	
		SP3	0.802	

Cognitive Triggering Event	73.218%	Q50 (CT1)	0.822	0.816
		Q51 (CT2)	0.682	
		Q52 (CT3)	0.692	
Cognitive Exploration	68.404%	Q53 (CE1)	0.789	0.766
		Q54 (CE2)	0..754	
		Q55 (CE3)	0..509	
Cognitive Integration	69.670%	Q56 (CI1)	0.646	0.777
		Q57 (CI2)	0.654	
		Q58 (CI3)	0.791	
Cognitive Resolution	67.643%	Q59 (CR1)	0.805	0.758
		Q60 (CR2)	.0760	
		Q61 (CR3)	0.465	
Cognitive Presence	69.802%	CP1	0.612	0.851
		CP2	0.755	
		CP3	0.774	
		CP4	0.651	
Sense of Belonging	64.998%	Q62 (Bel1)	0.651	0.891
		Q63 (Bel2)	0.665	
		Q64 (Bel3)	0.598	
		Q65 (Bel4)	0.710	
		Q66 (Bel5)	0.720	
		Q67 (Bel6)	0.556	
Connectedness	73.857%	Q68 (Con1)	0.725	0.911
		Q69 (Con2)	0.775	
		Q70 (Con3)	0.747	
		Q71 (Con4)	0.772	
		Q72 (Con5)	0.674	

5.2   Descriptive Analysis using Frequency Tables and Means

Table 5.2 shows the mean and standard deviation of the research variables. It was noticed that the mean value of all research variables is above an average of 2.5. All frequencies of research variables are also relatively high, indicating that most of the respondents' opinions lie in the zone of 4 and 5, i.e. the zone of agreement.

Table 5.2 Descriptive analysis of research variables

Variable	Mean	Standard Deviation	Frequency				
			1	2	3	4	5
Facebook Usage Intensity	3.6998	1.06900	11	66	121	170	135
Teaching Design	3.8061	.99328	3	54	121	175	142
Teaching Facilitation	3.5798	.99044	9	75	111	220	80
Teaching Direct Instruction	3.4811	1.12116	11	97	105	219	71
Teaching Presence	3.5785	.93690	1	82	119	227	74
Social Affective Expression	3.6461	1.12116	20	73	97	188	125
Social Open Communication	3.8608	1.05455	9	50	115	157	172
Social Group Cohesion	3.8860	1.09151	13	42	125	129	191
Social Presence	3.8032	1.06699	9	60	111	164	159
Cognitive Triggering Event	3.2087	.97282	25	72	228	129	49
Cognitive Exploration	3.2275	.84387	15	52	275	122	37
Cognitive Integration	3.2595	.85120	5	76	246	132	42
Cognitive Resolution	3.1317	.93521	6	128	205	118	44
Cognitive Presence	3.3161	.76884	1	54	270	141	37
Educational Experience	3.5706	.80986	0	61	136	264	42
Belonging	3.8263	.92725	2	45	119	207	128
Connectedness	3.6806	1.08342	7	87	96	180	131

Table 5.3 shows the mean and standard deviation of some statements representing students' preferences regarding their Facebook and Moodle usage. It is noticed that a relatively larger number of students would rather use Facebook over using Moodle, except when they are being notified with their grades and when course material is shared in an organised way on Moodle.

Table 5.3 Descriptive analysis of students' preferences of Facebook and Moodle usage

Statement	Mean	Standard Deviation	Frequency				
			1	2	3	4	5
I usually access the Group using my mobile Facebook application.	4.0557	1.22429	36	32	51	133	251
It is more convenient for me to access the Group via my mobile phone.	4.0099	1.0849	20	36	65	180	202
If I have an enquiry, I would ask it on the Group.	3.7396	1.09951	22	49	107	185	140
If I see an enquiry post that I know the answer to, I would immediately reply.	3.6382	1.17760	25	73	103	160	142
I prefer receiving course material via the FB Group.	3.5050	1.28873	59	53	90	177	124
It is easy to search for the posted course material on the FB Group.	2.8012	1.47362	138	93	101	73	98
I prefer being notified with course withdrawal warnings on the FB Group.	2.6772	1.51413	164	96	81	65	97
I prefer to see my course grades posted on the Facebook Group	2.7080	1.55034	169	81	83	61	106
The FB Group helps me keep updated with all what is happening at CMT.	3.8257	1.24493	39	47	62	165	186
At the beginning of every semester I make sure to enrol my courses on CMTs Moodle Website.	2.4168	1.43626	192	100	82	57	68
I regularly access the CMTs Moodle Website throughout the semester.	2.2942	1.21450	169	135	112	56	31
I prefer accessing Moodle from a computer browser.	2.6815	1.5138	162	89	78	72	92
It is more convenient to access Moodle using my mobile phone.	3.2028	1.272285	74	75	98	187	69
I would rather find the course material organised on Moodle than having to search for it myself on the CMT FB Group	3.4721	1.18128	50	43	123	192	94
I prefer receiving my course grades privately on the Moodle than have them posted publicly on the CMT FB Group	3.4851	1.23013	45	62	120	156	120
My instructors regularly use Moodle.	2.3002	1.1772	157	150	110	60	26
I prefer using the Moodle forum option to interact with my instructors and classmates rather than the FB Group.	2.2525	1.27412	184	143	82	53	41

Table 5.4 Frequency tables of students' demographics

Demographics	Groups	Frequency	Total
Gender	Males	288	488
	Females	200	
CMT Department	Marketing Management	118	498
	Media Management	65	
	Business Information System	115	
	Finance	131	
	Accounting	69	
Academic Semester	First Semester	0	498
	Second Semester	0	
	Third Semester	59	
	Fourth Semester	96	
	Fifth Semester	103	
	Sixth Semester	77	
	Seventh Semester	87	
	Eighth Semester	76	
FB Account	No	2	502
	Yes	500	
Membership in CMT FB Group	No	20	452
	Yes	432	
Number of Friends on FB	1 – 300 Friends	68	500
	301 – 600 Friends	169	
	601 – 1000 Friends	156	
	More than 1000 Friends	107	
Daily Time Spent with FB	Less than half an hour	23	495
	Half an hour – less than 1 hour	57	
	1 hour – 2 hours	114	
	More than 2 hours	301	

Table 5.4 shows the frequency tables of the sample under study, where it could be observed that the largest number respondents is males (n=288), whereas the number of female respondents is (n=200). Almost all students have Facebook accounts (n=498) and almost all of them are members of the CMT Facebook Group (n=432). Many students have a wide range of Facebook friends and many of them spend more than an hour daily using Facebook.

5.3   Hypothesis Testing

This section will present the results of tests done to respond to the hypotheses under study, by finding the relationships between the independent and dependent variable(s). In order to achieve this, correlation matrices and regression models will be constructed. A correlation matrix is a matrix that indicates the correlations between all pairs of data sets, by calculating the Pearson's correlation coefficient between the variables under study. The correlation coefficient's value ranges between <0.001 (indicating no correlation) and ±1.00 (indicating perfect correlation) (Foster et al., 2004). Regression analysis is a model fitted by assessing the direct relationship between variables and showing the causal relationship specifying the dependent and independent variable(s) (Foster et al., 2001).

The hypotheses to be tested in this chapter are stated as follows and are illustrated in the model shown in Figure 5.2.
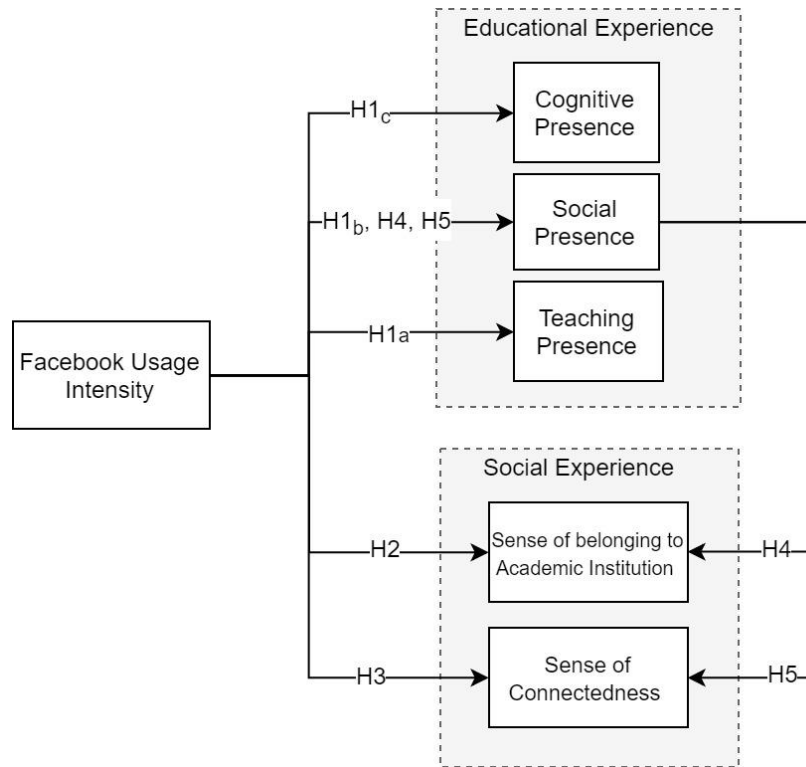
Figure 5.2 Hypotheses Model

H1$_a$: There is a significant relationship between Facebook usage intensity and the teaching presence of the educational experience.

H1$_b$: There is a significant relationship between Facebook usage intensity and the social presence of the educational experience.

H1$_c$: There is a significant relationship between Facebook usage intensity and the cognitive presence of the educational experience.

H2: There is a significant relationship between Facebook usage intensity and sense of belonging to the academic institution.

H3: There is a significant relationship between Facebook usage intensity and sense of connectedness.

H4: Social presence of the educational experience mediates the relationship between Facebook usage intensity and sense of belonging to the academic institution.

H5: Social presence of the educational experience mediates the relationship between Facebook usage intensity and sense of connectedness.

5.4   H1a: Relationship between FBUI and Teaching Presence

The educational experience includes the teaching, social and cognitive presences and accordingly, a correlation matrix and a regression analysis will be conducted to test the impact of Facebook usage intensity (FBUI) on each of the presences respectively.

Table 5.5 Correlation matrix between FBUI and TP

		FBUI	Teaching Design	Facilitation	Direct Instruction	Teaching Presence
FBUI	**Pearson Correlation**	1	.414[**]	.433[**]	.477[**]	.444[**]
	P-value		< .001	< .001	< .001	< .001
	N	503	495	495	503	503
Teaching Design	**Pearson Correlation**	.414[**]	1	.689[**]	.687[**]	.811[**]
	P-value	< .001		< .001	< .001	< .001
	N	495	495	495	495	495
Facilitation	**Pearson Correlation**	.433[**]	.689[**]	1	.773[**]	.903[**]
	P-value	< .001	< .001		< .001	< .001
	N	495	495	495	495	495
Direct Instruction	**Pearson Correlation**	.477[**]	.687[**]	.773[**]	1	.892[**]
	P-value	< .001	< .001	< .001		< .001
	N	503	495	495	503	503
Teaching Presence	**Pearson Correlation**	.444[**]	.811[**]	.903[**]	.892[**]	1
	P-value	< .001	< .001	< .001	< .001	
	N	503	495	495	503	503

The correlation matrix between FBUI and Teaching Presence (TP) is presented in Table 5.5, where the value of Pearson's correlation is calculated. Results show that the

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correlation coefficient of TP variables (Teaching Design, Facilitation, Direct Instruction, and Teaching Presence) are 0.414[**], 0.433[**], 0.477[**], and 0.444[**] respectively with P-values of less than 0.001. Thus, this indicates a significant positive moderate correlation between FBUI and TP variables (Teaching Design, Facilitation, Direct Instruction, Teaching Presence), as shown in Table 5.5.

In Table 5.6, a regression model is conducted to regress FBUI on teaching design, and it was found that there is a significant positive impact of FBUI on teaching design, with a coefficient of 0.386 and a p-value of less than 0.001. Moreover, the R-squared value of 0.172 indicates that FBUI explains 17.2% of the variation in teaching design.

Table 5.6 Regression analysis of FBUI on teaching design

	Unstandardized Coefficients		Standardized Coefficients	t	P-value	R Squared
	B	Std. Error	Beta			
(Constant)	2.561	.276		9.290	< .001	.172
FBUI	.268	.076	.285	3.501	.001	

The low R-squared value present in the results could be a reflection of noise in the data. Statistical noise is defined as unexplained variability within a data sample; the more true noise in the data, the lower the R-Squared (Wang et al., 2017). There are different factors that can cause the R-Squared value to be low.

For example, when predictor or outcome variables are categorical (e.g. rating scales) or counts, the R-Squared will typically be lower than with truly numeric data. This is the case with the variables tested in the current model, since all questions have a 5-point Likert scale for respondents to choose from. The noise can be down to unpredictability of human

responses. Therefore, it would be hard to achieve a high R-squared value when building models based on stated preferences of people, where there is a lot of noise (Wang et al., 2017).

Even though 17.2% is not considered a high percentage, it still indicates that FBUI as a proposed variable does contribute to the variation of teaching design as part of the teaching presence construct. Teaching design as an element of the teaching presence is concerned with instructors' development of programmes, activities and lesson plans, as well as regulating the amount of content covered.

Table 5.7 Regression between FBUI and facilitation

	Unstandardized Coefficients		Standardized Coefficients	t	P-value	R Squared
	B	Std. Error	Beta			
(Constant)	2.094	.145		14.430	< .001	.187
FBUI	.402	.038	.433	10.654	< .001	

In Table 5.7, a regression model is conducted to regress Facebook usage intensity on teaching facilitation, where it was found that there is a significant positive effect of FBUI on teaching facilitation, with a coefficient of 0.402 and a p-value of less than 0.001. The R-squared value was found to be 0.187, which means that FBUI explains 18.7% of the variation in teaching facilitation.

Even though 18.7% is not considered a high percentage, it still indicates that FBUI as a proposed variable does contribute to the variation of teaching facilitation as part of the teaching presence construct. Facilitation of discourse includes instructors' reviews and comments on students' posts and participation, raising questions, and observing direct

discussions. The efficient moderation of discussions taking place forms an important part of the teaching presence facilitation. Similar to the situation with the teaching design variable, the low R-squared value could be a result of noise in the dataset.

Table 5.8 Regression between FBUI & direct instruction

	Unstandardized Coefficients		Standardized Coefficients	t	P-value	R Squared
	B	Std. Error	Beta			
(Constant)	1.787	.145		12.328	< .001	.228
FBUI	.458	.038	.477	12.162	< .001	

In Table 5.8, a regression model is conducted to regress FBUI on direct instruction, where it was found that there is a significant positive impact of FBUI on direct instruction, with a coefficient of 0.458 and a p-value of less than 0.001. The R-squared value is 0.228, which means that FBUI explains 22.8% of the variation in direct instruction. This indicates that FBUI as a proposed variable does contribute to the variation of teaching instruction as part of the teaching presence construct that is in turn a dimension of the educational experience. Out of the three variables included in the TP construct, FBUI contributes the most to direct instruction. Direct instruction is described as providing intellectual and scholarly leadership from a subject matter expert, in order to diagnose comments for accurate understanding, inject sources of information, direct useful discussions, and elevate learner knowledge to a higher level (Swan et al., 2009).

Table 5.9 Regression between FBUI and teaching presence

	Unstandardized Coefficients		Standardized Coefficients	t	P-value	R Squared
	B	Std. Error	Beta			
(Constant)	2.138	.135		15.827	< .001	.197
FBUI	.389	.035	.444	11.099	< .001	

Table 5.9 shows that there is a significant positive impact of Facebook usage intensity on the teaching presence, with a coefficient of 0.389 and a p-value of less than 0.001. The R-squared was found to be 0.197, which means that FBUI explains 19.7% of the variation in teaching presence. Even though 19.7% is not considered a high percentage, it still indicates that FBUI as a proposed variable does contribute to the variation of teaching presence as part of the educational experience.

After comparing R-squared values of the impact of FBUI on the different TP variables, it could be observed that FBUI has the highest contribution to explaining teaching instructions (R-Squared= 0.228), then teaching facilitation (R-Squared= 0.187), while it contributes the least to teaching design (R-Squared= 0.172).

Teaching presence occurs when instructors design, support and direct student activities to provide a powerful learning experience. It includes three components: the design and organisation of course materials and learning activities; the encouragement and guidance of discussion and interaction that produce learning (Rourke et al., 2001), and direct instruction through providing expertise and information (Shea et al., 2010).

According to the results discussed in the current section, the contribution of FBUI to the teaching presence, as one of the three dimensions of the educational experience, turned out

to be positively significant. That in turn indicates that hypothesis **H1$_a$** is accepted and supported because the teaching presence as a construct is significant.

5.5   H1$_b$: Relationship between FBUI and Social Presence

A correlation matrix between FBUI and social presence is presented in Table 5.10, where the value of Pearson's correlation is calculated.

Table 5.10 Correlation matrix between FBUI & social presence

		FBUI	Affective Expression	Open Communication	Group Cohesion	Social Presence
FBUI	Pearson Correlation	1	.548**	.564**	.509**	.598**
	P-value		< .001	< .001	< .001	< .001
	N	503	503	503	500	503
Affective Expression	Pearson Correlation	.548**	1	.786**	.744**	.902**
	P-value	< .001		< .001	< .001	< .001
	N	503	503	503	500	503
Open Communication	Pearson Correlation	.564**	.786**	1	.710**	.884**
	P-value	< .001	< .001		< .001	< .001
	N	503	503	503	500	503
Group Cohesion	Pearson Correlation	.509**	.744**	.710**	1	.881**
	P-value	< .001	< .001	< .001		< .001
	N	500	500	500	500	500
Social Presence	Pearson Correlation	.598**	.902**	.884**	.881**	1
	P-value	< .001	< .001	< .001	< .001	
	N	503	503	503	500	503

Results show that the correlation coefficients of SP variables (Affective Expression, Open Communication, Group Cohesion and Social Presence) are 0.548[**], 0.564[**], 0.509[**] and 0.598[**] respectively with a P-value of less than 0.001 for all of them. Thus, there is a significant positive moderate correlation between FBUI and SP variables (Affective Expression, Open Communication, Group Cohesion and Social Presence) as presented in Table 5.10. Despite the fact that the correlation coefficients of all three SP variables are in the moderate zone, open communication and affective expression are very close to a strong correlation with correlation coefficients of 0.564 and 0.548 respectively.

Table 5.11 Regression between FBUI & affective expression

	Unstandardized Coefficients		Standardized Coefficients	t	P-value	R Squared
	B	**Std. Error**	**Beta**			
(Constant)	1.521	.151		10.073	< .001	.300
FBUI	.574	.039	.548	14.655	< .001	

In Table 5.11 a regression model is conducted to regress FBUI on affective expression, and it was found that there is a significant positive impact of FBUI on affective expression, with a coefficient of 0.574 and a p-value of less than 0.001. An R-squared of 0.300 indicates that FBUI explains 30% of the variation in affective expression. This shows that FBUI as a proposed variable does contribute to the variation of affective expression as part of the social presence construct that is in turn a dimension of the educational experience.

Table 5.12 Regression between FBUI and open communication

	Unstandardized Coefficients		Standardized Coefficients	t	P-value	R Squared
	B	Std. Error	Beta			
(Constant)	1.804	.140		12.866	< .001	.318
FBUI	.556	.036	.564	15.274	< .001	

In Table 5.12, a regression model is conducted to regress FBUI on open communication, where it was found that there is a significant positive impact of FBUI on open communication, with a coefficient of 0.556 and a P-value of less than 0.001. The R-squared value is 0.318, which means that FBUI explains 31.8% of the variation in open communication. This shows that FBUI as a proposed variable does contribute to the variation of open communication as part of the social presence construct that is in turn a dimension of the educational experience.

Table 5.13 Regression between FB intensity and group cohesion

	Unstandardized Coefficients		Standardized Coefficients	t	P-value	R Squared
	B	Std. Error	Beta			
(Constant)	1.963	.152		12.951	< .001	.260
FBUI	.519	.039	.509	13.212	< .001	

In Table 5.13 regression model is conducted to regress FBUI on group cohesion, where a significant positive impact of FBUI, with a coefficient of 0.519 and a p-value less than 0.001, was found. The R-squared value was found to be 0.260, which means that FBUI explains 26% of the variation in group cohesion as one of the variables of SP.

Even though the contribution of FBUI in the variation of group cohesion as part of the social presence construct is not very high, its effect is still present.

Table 5.14 Regression between FBUI and SP

	Unstandardized Coefficients		Standardized Coefficients	t	P-value	R Squared
	B	**Std. Error**	**Beta**			
(Constant)	1.596	.138		11.591	< .001	.357
Facebook Intensity	.597	.036	.598	16.690	< .001	

In Table 5.14 a regression model is conducted to regress FBUI on SP. The model indicates a significant positive impact of FBUI on SP, with a coefficient of 0.597 and a p-value of less than 0.001. The R-squared is 0.357, which means that FBUI explains 35.7% of the variation in SP. This indicates that FBUI as a proposed variable does contribute to the variation of social presence construct that is in turn a dimension of the educational experience.

Comparing R-Squared values of the impact of Facebook usage intensity on social presence variables, it could be observed that FBUI has the highest contribution to explaining open communication (R-Squared= 0.318), followed by affective expression (R-Squared= 0.300), while the least one is group cohesion (R-Squared= 0.260). According to results discussed in Section 5.3.2, the contribution of FBUI to the social presence, as one of the three dimensions of the educational experience, turned out to be positively significant. That in turn indicates that hypothesis $H1_b$ is accepted because the social presence as a construct is significant.

5.6   H1$_c$: Relationship between FBUI and Cognitive Presence

A correlation matrix between FBUI and CP is shown in Table 5.15, where the value of Pearson's correlation is calculated. Results show that the correlation coefficients of CP variables (Triggering Event, Exploration, Integration, Resolution, Cognitive Presence) are 0.330, 0.144, 0.208, and 0.093, with P-values of <0.001 for all the variables, except for resolution which has a P-value of 0.037.

Accordingly, there is a significant positive moderate correlation between FBUI and triggering event, and a significant moderate but weak correlation between FBUI and the remaining CP variables, namely exploration, integration, and resolution.

Table 5.15 Correlation matrix between FBUI and cognitive presence

		FBUI	Triggering Event	Exploration	Integration	Resolution	Cognitive Presence
FBUI	Correlation (r)	1					
	P-value						
	N	503					
Triggering Event	Correlation (r)	.330**	1				
	P-value	<					
	N	503	503				
Exploration	Correlation (r)	.144**	.579**	1			
	P-value	<	< .001				
	N	501	501	501			
Integration	Correlation (r)	.208**	.597**	.694**	1		
	P-value	<	< .001	< .001			
	N	501	501	501	501		
Resolution	Correlation (r)	.093*	.463**	.611**	.628**	1	
	P-value	.037	< .001	< .001	< .001		
	N	501	501	501	501	501	
Cognitive Presence	Correlation (r)	.210**	.719**	.824**	.847**	.764**	1
	P-value	<	< .001	< .001	< .001	< .001	
	N	503	503	501	501	501	503

Table 5.16 Regression between FBUI and triggering event

	Unstandardized Coefficients		Standardized Coefficients	t	P-value	R Squared
	B	Std. Error	Beta			
(Constant)	2.096	.148		14.185	< .001	.109
FBUI	.301	.038	.330	7.837	< .001	

In Table 5.16, a regression model is conducted to regress FBUI on triggering event, where it was found that there is a significant positive impact of FBUI on triggering event, with a coefficient of 0.301 and a p-value of less than 0.001. The R-squared value was found to be 0.109, indicating that FBUI explains 10.9% of the variation in triggering event. Despite the fact that the R-squared value is very low, the effect of FBUI on triggering event as a variable of the cognitive presence still exists.

Table 5.17 Regression between FBUI and exploration

	Unstandardized Coefficients		Standardized Coefficients	t	P-value	R Squared
	B	Std. Error	Beta			
(Constant)	2.808	.135		20.858	< .001	.021
FBUI	.113	.035	.144	3.244	.001	

A regression model is conducted as shown in Table 5.17 to regress FBUI on exploration, where it was found that there is a significant positive impact on exploration, with a coefficient of 0.113 and a p-value of less than 0.001. The R-squared value was found to be 0.021, which means that FBUI explains 2.1% of the variation in exploration. Despite the fact that the R-squared value is extremely low, the effect of FBUI on exploration as a variable of the cognitive presence construct still exists.

Table 5.18 Regression between FBUI and CP integration

	Unstandardized Coefficients		Standardized Coefficients	t	P-value	R Squared
	B	Std. Error	Beta			
(Constant)	2.647	.134		19.725	< .001	.043
FBUI	.165	.035	.208	4.746	< .001	

In Table 5.18, a regression model is conducted to regress FBUI on integration as one of the CP variables. It was found that there is a significant positive impact of FBUI on CP integration, with a coefficient of 0.165 and a p-value of less than 0.001. The R-squared value is 0.043, which indicates that FBUI explains 4.3% of the variation in CP integration. Despite the fact that the R-squared value is extremely low, the effect of FBUI on integration as a variable of the cognitive presence construct still exists.

Table 5.19 Regression between FBUI and CP resolution

	Unstandardized Coefficients		Standardized Coefficients	t	P-value	R Squared
	B	Std. Error	Beta			
(Constant)	2.830	.150		18.856	< .001	.009
FBUI	.081	.039	.093	2.090	.037	

A regression model is conducted and presented in Table 5.19 to regress FBUI on CP resolution variable. A coefficient of 0.081 and a p-value of less than 0.001 indicate a significant positive impact of FBUI on CP's resolution. The R-squared value of 0.009 denotes that FBUI explains 0.9% of the variation in resolution.

Since the R-squared value is less than 1%, this indicates that FBUI contributes very little in helping students come to a resolution of the questions or problems, raised by the triggering event phase of the CoI, in ways that can be applied in the future (Richardson et al., 2012).

Table 5.20 Regression between FBUI and CP

	Unstandardized Coefficients		Standardized Coefficients	t	P-value	R Squared
	B	Std. Error	Beta			
(Constant)	2.757	.121		22.789	< .001	.044
FBUI	.151	.031	.210	4.813	< .001	

The regression model in Table 5.20 is conducted to regress FBUI on cognitive presence as a whole. A coefficient of 0.151 and a p-value of less than 0.001 indicate a significant positive impact of FBUI on CP. The R-squared value of 0.044 denotes that FBUI explains 4.4% of the variation in CP.

Comparing R-Squared values of the impact of FBUI on cognitive presence variables, it could be observed that FBUI has the highest contribution to explaining triggering event (R-Squared= 0.109), then integration (R-Squared= 0.043), then exploration (R-Squared= 0.021), while the least one is resolution (R-Squared= 0.009). The results discussed previously reveal that the contribution of FBUI to the cognitive presence is positively significant, which means that hypothesis $H1_c$ is accepted but very weakly supported. However, out of all three presences of the educational experience, Facebook usage has the least effect on the cognitive presence that refers to the intellectual engagement with course concepts, and the students' ability to create meaning out of ideas and facts, developing competence through discussion, reflection and application (Garrison et al., 2010a).

Table 5.21 Regression between FBUI and educational experience

	Unstandardized Coefficients		Standardized Coefficients	t	P-value	R Squared
	B	Std. Error	Beta			
(Constant)	2.131	.112		19.057	< .001	.264
FBUI	.389	.029	.513	13.394	< .001	

Furthermore, a regression model for the educational experience as a whole is presented in Table 5.21. A coefficient of 0.389 and a p-value of less than 0.001 indicate a significant positive impact of FBUI on the educational experience as a whole. The R-squared value is 0.264, which indicates that FBUI explains 26.4% of the variation in educational experience.

In addition, it could be observed that FBUI has the highest contribution to explaining social presence (R-Squared= 0.357), then teaching presence (R-Squared= 0.197), while the least presence affected by FBUI is the cognitive presence (R-Squared= 0.044). Results indicate that Facebook usage intensity affects the social dimension of the educational experience the most. This means that it enriches the amount of social and emotional connection among the members of a course, expression of affect and connectedness with others; open communication with others in the course; and group cohesion, which includes acknowledgement and trust (Arbaugh et al., 2008)

5.7   H2: Relationship between FBUI and SBAI

A correlation matrix between FBUI and SBAI is illustrated in Table 5.22, where the value of Pearson's correlation is calculated. Results show that the correlation coefficient between FBUI and students' SBAI is 0.585 with a P-value of less than 0.001. Thus, there is a

significant positive moderate correlation between FBUI and SBAI as shown in Table 5.22. Although the correlation coefficient is in the moderate zone, it is very close to indicating a strong correlation between the independent and dependent variables. This indicates that the intensity of students' Facebook usage and their sense of belonging to the academic institution have an almost strong positive relationship.

Table 5.22 Correlation Matrix between FBUI & SBAI

		FBUI	**SBAI**
FBUI	Correlation (r)	1	
	P-value		
	N	503	
SBAI	Correlation (r)	.585[**]	1
	P-value	< .001	
	N	501	501

A regression model is conducted to regress on SBAI, where it was found that there is a significant positive impact of SBAI, with coefficient of 0.507 and p-value of less than 0.001. Also, the R-squared was found to be 0.342, which means that FBUI explains 34.2% of the variation in SBAI.

Table 5.23 Regression between FBUI and SBAI

	Unstandardized Coefficients		**Standardized Coefficients**	**t**	**P-value**	**R Squared**
	B	**Std. Error**	**Beta**			
(Constant)	1.951	.121		16.086	< .001	.342
FBUI	.507	.031	.585	16.101	< .001	

The results mentioned in Table 5.23 revealed that the contribution of FBUI in SBAI is positively significant, which means that the hypothesis H2 is accepted.

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5.8   H3: Relationship between FBUI and Sense of Connectedness

A correlation matrix between FBUI and sense of connectedness is presented in Table 5.24, where the value of Pearson's correlation is calculated. Results show that the correlation coefficient between FBUI and sense of connectedness is 0.579^{**}, with P-value of less than 0.001. Therefore, there is significant positive moderate correlation between FBUI and sense of connectedness, as shown in Table 5.24. Although the correlation coefficient is in the moderate zone, it is very close to indicating a strong correlation between the independent- and dependent variables. This indicates that the intensity of students' Facebook usage and their sense of connectedness have an almost strong positive relationship.

Table 5.24 Correlation matrix between FBUI and sense of connectedness

		FBUI	**Sense of Connectedness**
FBUI	Correlation (r)	1	
	P-value		
	N	503	
Sense of Connectedness	Correlation (r)	$.579^{**}$	1
	P-value	$< .001$	
	N	501	501

A regression model is conducted to regress on sense of connectedness, where it was found that there is a significant positive impact of educational experience, with coefficient of 0.586^{**} and p-value of less than 0.001. Also, the R-squared was found to be 0.335, which means that FBUI explains 33.5% of the variation in sense of connectedness.

The results in Table 5.25 revealed that the contribution of FBUI in sense of connectedness is positively significant, which means that hypothesis H3 is accepted.

Table 5.25 Regression between FBUI and sense of connectedness

	Unstandardized Coefficients		Standardized Coefficients	t	P-value	R Squared
	B	Std. Error	Beta			
(Constant)	1.512	.142		10.615	< .001	.335
FBUI	.586	.037	.579	15.845	< .001	

5.9   H4: Mediation of Social Presence between FBUI and SBAI

To test the mediation impact of the social presence of the educational experience between FBUI and SBAI, the following steps should be followed. First the impact of FBUI on the social presence should be tested, which has already been tested in hypotheses $H1_b$. Then the impact of FBUI on SBAI should be tested, which has also been tested in hypothesis H2. This should be followed by testing the impact of the social presence of the educational experience on SBAI. Finally, if results of the previously mentioned tests are proven to be significant, then the impact of FBUI on SBAI should be tested in the presence of the SP.

Table 5.26 Regression analysis of social presence on SBAI

	Unstandardized Coefficients		Standardized Coefficients	t-value	P-value	R-Squared
	B	Std. Error	Beta			
(Constant)	1.186	.107		11.060	< .001	.589
Affective expression	.312	.042	.381	7.382	< .001	
Open communication	.128	.043	.147	2.998	.003	
Group cohesion	.261	.038	.309	6.834	< .001	

This section will present the testing process of the social presence variables mediation role between FBUI and SBAI. Table 5.26 shows that there is a significant positive impact of affective expression, open communication, and group cohesion on SBAI, with coefficients of 0.312, 0.128 and 0.261 respectively and p-values that are less than 0.05. Moreover, an R-squared value of 0.589 indicates that the SP variables explain 58.9% of the variation in SBAI.

According to the results in Table 5.26, social presence variables could be ranked as follows: affective expression with a standardized beta of 0.381, then group cohesion with a standardized beta of 0.309, and finally open communication with a standardized beta of 0.147.

Table 5.27 Regression between FBUI & affective expression on sense of self belonging

	Unstandardized Coefficients		Standardized Coefficients	t	P-value	R Squared
	B	**Std. Error**	**Beta**			
(Constant)	1.236	.108		11.457	< .001	.567
FBUI	.238	.031	.274	7.791	< .001	
Affective expression	.469	.029	.567	16.117	< .001	

In addition, FBUI and affective expression have a significant positive impact on the dependent variable SBAI with coefficients of 0.238 and 0.469 respectively, and P-values of less than 0.001 as shown in Table 5.27. Therefore, affective expression is a partial mediator between FBUI and SBAI.

Table 5.28 Regression between FBUI & open communication on sense of self belonging

	Unstandardized Coefficients		Standardized Coefficients	t	P-value	R Squared
	B	Std. Error	Beta			
(Constant)	1.184	.122		9.702	< .001	.501
FBUI	.271	.033	.313	8.181	< .001	
Open communication	.424	.034	.482	12.590	< .001	

Table 5.28 shows that FBUI and open communication have a positive significant impact on the dependent variable SBAI with coefficients of 0.271 and 0.424 respectively, and P-values of less than 0.001. Therefore, open communication is a partial mediator between FBUI and SBAI.

Table 5.29 Regression between FBUI & group cohesion on SBAI

	Unstandardized Coefficients		Standardized Coefficients	t	P-value	R Squared
	B	Std. Error	Beta			
(Constant)	1.071	.115		9.321	< .001	.557
FBUI	.268	.030	.312	8.969	< .001	
Group cohesion	.454	.029	.538	15.485	< .001	

Table 5.29 shows that FBUI and group cohesion have a significant positive impact on the dependent variable SBAI with coefficients of 0.268 and 0.454, and P-values of less than 0.001. This indicates that group cohesion as a dimension of the social presence is a partial mediator between FBUI and SBAI.

Table 5.30 Regression between FBUI & social presence on sense of self belonging

	Unstandardized Coefficients		Standardized Coefficients	t	P-value	R Squared
	B	Std. Error	Beta			
(Constant)	1.138	.112		10.199	< .001	.562
FBUI	.204	.032	.236	6.374	< .001	
Social Presence	.508	.032	.585	15.817	< .001	

Table 5.30 shows that FBUI and social presence have a significant positive impact on the dependent variable SBAI, with coefficients of 0.204 and 0.508, and P-values of less than 0.001. According to the results, social presence is a partial mediator between FBUI and SBAI.

Results discussed in the current section indicate that there is a partial mediation of social presence (as a construct) in the relationship between FBUI and SBAI, as FBUI significance had been reduced but is still present. Therefore, hypothesis H4 is partially accepted, as full mediation did not take place.

5.10 H5: Mediation of Social Presence between FBUI and Sense of Connectedness

To test the mediation impact of the social presence of the educational experience between FBUI and sense of connectedness, the following steps should be followed. First, the impact of FBUI on the social presence should be tested, which has already been tested in hypotheses $H1_b$; then the impact of FBUI on sense of connectedness should be tested, which has also been tested in hypothesis H3. This should be followed by testing the impact of the social presence on sense of connectedness. Finally, if results of the previously

mentioned tests are proven to be significant, then the impact of FBUI on sense of connectedness should be tested in the presence of SP.

This section will present the testing process of the social presence variables mediation between FBUI and sense of connectedness. Table 5.31 shows that there is a significant positive impact of affective expression, open communication, and group cohesion on SBAI, with coefficients of 0.397, 0.272 and 0.187 respectively and p-values that are less than 0.05. Moreover, an R-squared value of 0.616 indicates that the SP variables explain 61.6% of the variation in sense of connectedness.

Table 5.31 Regression Analysis of Social Presence on Sense of Connectedness

	Unstandardized Coefficients		Standardized Coefficients	t-value	P-value	R-Squared
	B	Std. Error	Beta			
(Constant)	.402	.122		3.304	.001	0.616
Affective expression	.187	.048	.194	3.889	< .001	
Open communication	.272	.048	.266	5.622	< .001	
Group cohesion	.397	.043	.400	9.146	< .001	

According to the results in Table 5.31, social presence variables could be ranked as follows: group cohesion with a standardized beta of 0.400, then open communication with a standardized beta of 0.266, and finally affective expression with a standardized beta of 0.194.

Table 5.32 Regression Analysis of FBUI and Affective Expression on Sense of Connectedness

	Unstandardized Coefficients		Standardized Coefficients	t-value	P-value	R-Squared
	B	Std. Error	Beta			
(Constant)	.710	.130		5.481	< .001	.543
FBUI	.284	.037	.280	7.745	< .001	
Affective expression	.526	.035	.545	15.063	< .001	

In addition, FBUI and affective expression have a positive significant impact on the dependent variable sense of connectedness with coefficients of 0.284 and 0.526 respectively, and P-values of less than 0.001, as shown in Table 5.32. Therefore, affective expression is a partial mediator between FBUI and sense of connectedness.

Table 5.33 Regression Analysis of FBUI and Open Communication on Sense of Connectedness

	Unstandardized Coefficients		Standardized Coefficients	t-value	P-value	R-Squared
	B	Std. Error	Beta			
(Constant)	.493	.137		3.605	< .001	.540
FBUI	.273	.037	.270	7.344	< .001	
Open communication	.563	.038	.548	14.915	< .001	

Table 5.33 shows that FBUI and open communication have a positive significant impact on sense of connectedness with coefficients of 0.273 and 0.563 respectively, and P-values of less than 0.001. Accordingly, open communication is a partial mediator between FBUI and sense of connectedness.

Table 5.34 Regression Analysis of FBUI and Group Cohesion on Sense of Connectedness

	Unstandardized Coefficients		Standardized Coefficients	t-value	P-value	R-Squared
	B	Std. Error	Beta			
(Constant)	.350	.129		2.711	.007	.596
FBUI	.284	.034	.280	8.447	< .001	
Group cohesion	.586	.033	.591	17.791	< .001	

Table 5.34 shows that FBUI and open communication have a positive significant impact on the dependent variable sense of connectedness with coefficients of 0.284 and 0.586, and P-values of less than 0.001. Therefore, open communication is a partial mediator between FBUI and sense of connectedness.

Table 5.35 Regression Analysis of FBUI and Social Presence on Sense of Connectedness

	Unstandardized Coefficients		Standardized Coefficients	t-value	P-value	R-Squared
	B	Std. Error	Beta			
(Constant)	.495	.127		3.911	< .001	.587
FBUI	.207	.036	.205	5.702	< .001	
Social Presence	.635	.036	.626	17.454	< .001	

Table 5.35 shows that FBUI and social presence have a positive significant impact on the dependent variable sense of connectedness, with coefficients of 0.207 and 0.635, and P-values of less than 0.001. Therefore, social presence is a partial mediator between FBUI and sense of connectedness.

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Results presented in Table 5.35 mean that there is a partial mediation of social presence variables in the relationship between FBUI and sense of connectedness, as FBUI significance had been reduced but is still present. As a result, hypothesis H5 is partially accepted.

5.11 Summary of Results

The model with added significant values after the hypotheses were tested is presented in Figure 5.3.
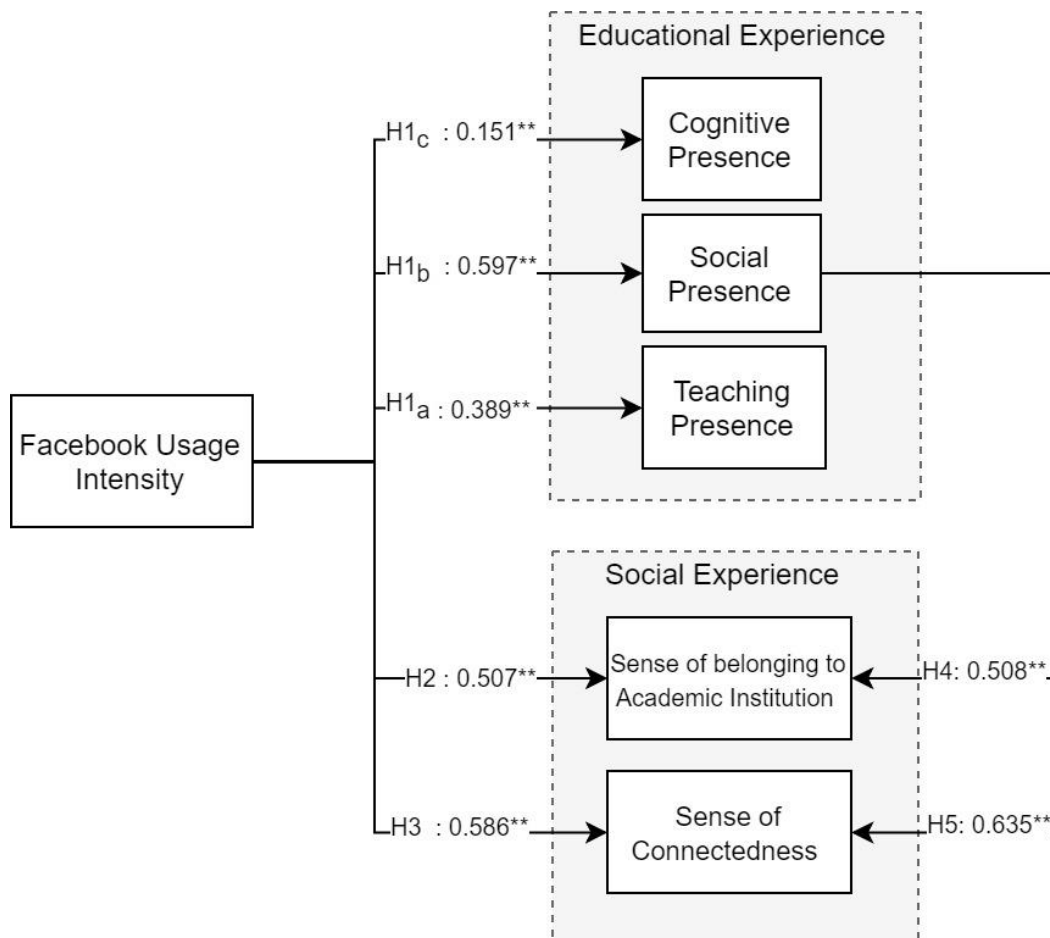
Figure 5.3 Model with significant values after testing

Considering the impact of FBUI on the three educational experience dimensions (teaching, social, and cognitive presence), results indicate there is a significant positive impact of FBUI on all of the educational experience dimensions, as all corresponding P-values are less than 0.05. Also, the contribution of FBUI is the highest in the case of Social Presence (R-Squared = 0.357), then the contribution of FBUI in Teaching Presence (R-Squared = 0.197), while the least contribution of FBUI is in the Cognitive Presence (R-Squared = 0.044).

In terms of the teaching presence variables: teaching design, facilitation and direct instruction, it has been observed that the contribution of FBUI is the highest on Teaching Instructions (R-squared = 0.228), then Teaching Facilitation (R-Squared = 0.187), while the least is the contribution of FBUI on Teaching Design (R-Squared = 0.172).

Regarding the Social Presence variables: Affective expression, Open communication and Group cohesion, it has been observed that the contribution of FBUI is the highest on Open communication (R-squared = 0.318), then Affective expression (R-Squared = 0.300), while the least is the contribution of FBUI on Group cohesion (R-Squared = 0.260).

Observing the Cognitive Presence variables: Triggering event, Cognitive Exploration, Cognitive Integration and Resolution, it has been observed that the contribution of FBUI is the highest on Triggering event (R-squared = 0.109), then Cognitive Integration (R-Squared = 0.043), then Cognitive Exploration (R-Squared = 0.021), while the least is the contribution of FBUI on Resolution (R-Squared = 0.009).

It has been observed that there is a significant positive impact of FBUI on SBAI and Connectedness, as corresponding P-values were less than 0.05. Finally, there was a

significant partial mediation of social presence between FBUI and SBAI, as it partially mediates the assigned relation.

Similarly, there was a significant partial mediation of the social presence dimension of the educational experience between FBUI and sense of connectedness, as it partially mediates the assigned.

Chapter 6 – Qualitative Data Analysis (Stage 3 and 4)

The current chapter will discuss stages 3 and 4 of the qualitative data collected through semi-structured interviews with CMT faculty members, and focus groups conducted with CMT undergraduate students (Figure 6.1).

1. Content analysis of the Facebook group interaction	2. Analysis of the students structured questionnaires	3. Analysis of the semi-structured faculty interviews	4. Analysis of focus groups
•Descriptive Statistics •Qualitative Analysis	•Descriptive Statistics •Quantitative Analysis	•Descriptive Statistics •Qualitative Analysis	•Qualitative Analysis
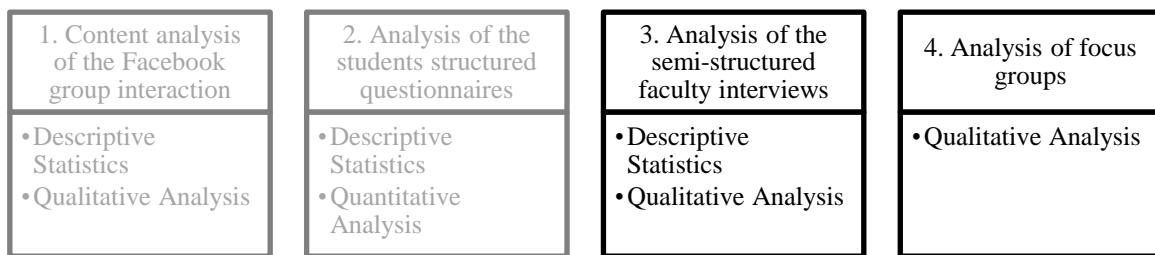
Figure 6.1 Stages of data analysis

6.1   Analysis of Faculty Semi-Structured Interviews

This section presents the findings from the qualitative approach and comments on the interview responses in order to identify similarities and differences between the findings of the content analysis and survey discussed previously in Chapters 4 and 5. The qualitative interviews for this research emerged from previous studies, the content analysis of Facebook interaction, as well as the students' survey responses and results. The interviews consisted of semi-structured questions that served as a guideline during the interview sessions.

6.2 Descriptive analysis

The researcher conducted twenty-one semi-structured interviews. The respondents involved in these interviews are all faculty members at CMT AAST Alexandria who are using Facebook and its features to interact with their students in college-related activities. The graphs presented in Figures 6.2 to 6.6 summarise the demographic characteristics of interviewed faculty members.
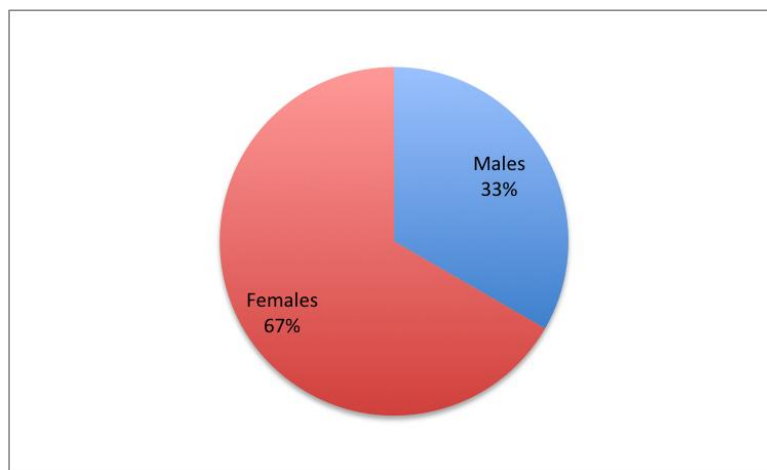
Figure 6.2 Faculty members' gender
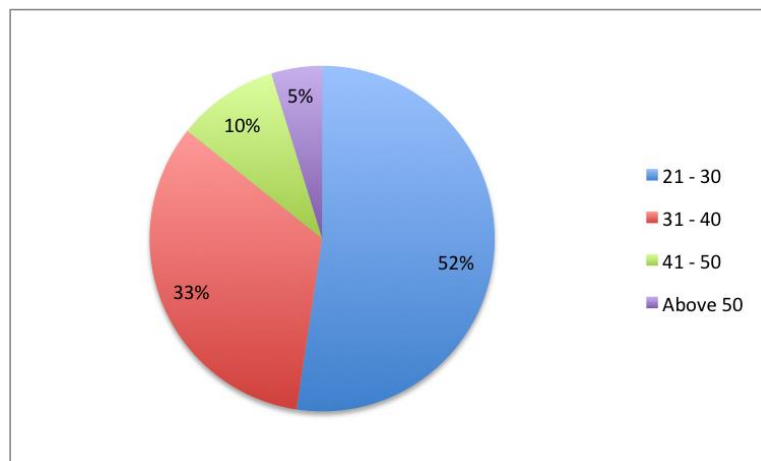
Figure 6.3 Faculty members' age groups

The respondents were a mixture of staff members of various positions and academic degrees who worked in the five academic departments of CMT. 33% of the respondents were males, while 67% were females. According to the statistics, 52% of the interviewees were between the ages of 21 and 30; 33% were between the ages of 31 and 40; 10% were between the ages of 41 and 50; and finally, 5% were above 50.
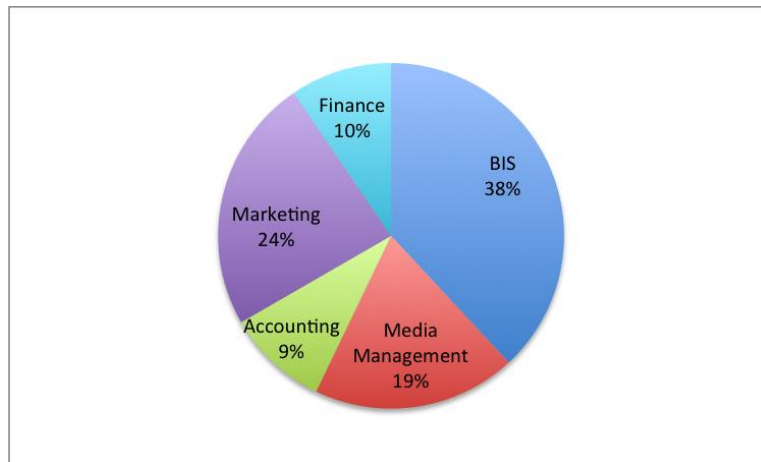
Figure 6.4 Faculty members' CMT academic departments
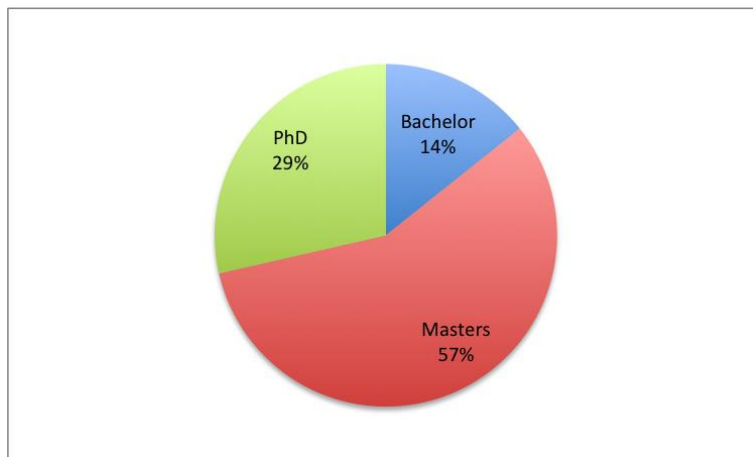
Figure 6.5 Faculty members' academic degrees
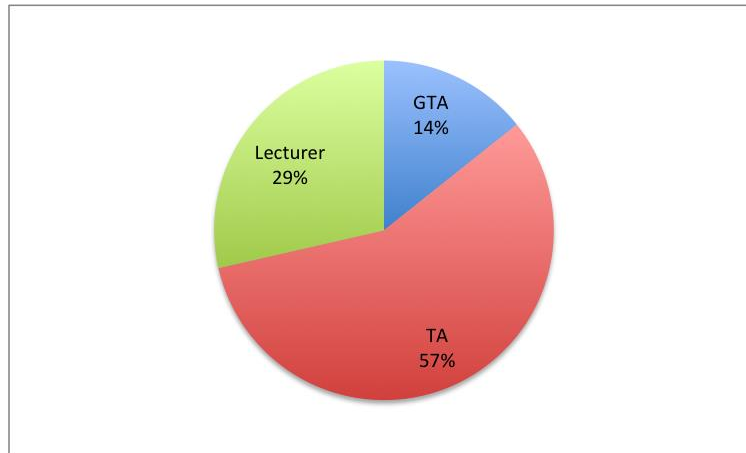
Figure 6.6 Interview respondents' positions

The age groups are directly associated with the respondents' academic degrees and positions at CMT. 52% of the respondents were between 21 and 30 years of age, and 57% of them are Master holders in the TA positions, leaving 14% in the position of GTA holding a Bachelor degree, and 29% who have obtained their PhD degree and hold the position of lecturer.

6.3   Thematic Analysis

Twenty-one faculty members at CMT took part in a semi-structured interview. The semi-structured interview questions were grouped into 12 sections (see Appendix A).

After conducting the interviews, the recordings were transcribed into word documents. These documents were later analysed and classified into themes. Content analysis is an intellectual process, but the outcomes of this process should be documented.

The researcher in this study adopted NVivo software for stages 3 and 4 of data analysis. After the thematic analysis of the interview recordings and transcripts, the three themes discussed in the following sections were developed. Data analysis began with open coding,

followed by several rounds of recoding and categorisation that involved constant comparison between and within categories (Strauss & Corbin, 1998).

6.4   Theme 1: Nature of Facebook Usage by Faculty

The first theme discusses dimensions related to the usage of Facebook by the faculty members. All respondents had social media readiness when it came to their capabilities of using Facebook and its affordances. All respondents also agreed that FB usage fits well with the way they teach.

When asked about how they used FB in class activities, respondents had common answers such as using it for i) posting course material; ii) class assignments; iii) announcements and notifications; and iv) posting exam grades.

All the respondents agreed that using FB fits well with the way they teach, and is compatible with their style and how they communicate with students.

The majority of respondents believed they had the knowledge and skills to use social media, especially Facebook, for personal and professional purposes, which indicates that faculty members at CMT have social media readiness despite their different age groups.

When asked about what they perceived as advantages of using FB in parallel with their regular face-to-face class interaction, teaching assistants of the BIS department had different answers that are summed up in the following two quotations:

> *"It's a genius way of reaching all the students enrolled in the same course at the same time, because everyone has Facebook app installed on his smartphone."*
>
> *"The advantages are more in the favour of students; they can now reach us at any time they wish in case they have any enquiry regarding the course".*

Facebook provides a two-way accessibility between students and faculty members that is independent from geographical and time constraints. They can both reach each other due to the availability that FB offers.

On the other hand, the only disadvantage of using FB in class activities that was reported by more than 50% of the respondents is that students expect faculty to be available all the time and reply immediately to any question or enquiry. The respondents do not mind replying, but they believe they have the right to reply whenever it is suitable for them to reply, and not immediately as expected by students. Hence, the asynchronous nature of communication features offered by Facebook does enhance the education experience. On the other hand, availability acts as a double-edged sword when it comes to the students' expectation of receiving an immediate response.

90% of respondents post withdrawal warnings and students' grades publicly on the FB group. Some added that sometimes they only write the student numbers and not the full names, so that some privacy is given to students.

When it comes to posting course materials, 85% of respondents do post copyrighted slides and PDFs as well as their own personally prepared course material such as lecture notes and presentations. 55% of the respondents use only smartphones to interact with students, while the rest use both smartphones and computers to access their Facebook accounts. Interestingly, none of the respondents thought that there were any perceived risks for using Facebook to interact and communicate with CMT students from all departments.

Table 6.1 sums up the implied themed dimensions which have to be present for a successful SNS experience to take place in the educational context between faculty members and students.

Table 6.1 Theme 1 Dimensions

Dimension	Meaning
SM Readiness	Faculty members' ability to use social media and its features for personal and professional use
Compatibility	The ability to integrate FB features with faculty members' teaching styles
Availability	The ability for students and faculty members to reach each other at any given time or place

6.5   Theme 2: Communities of Inquiry presences

The second theme covers the three presences of the CoI framework, but this time from the perspective of faculty members and how they think FB and its features can affect the social, teaching and cognitive presence.

6.5.1   Social Presence

More than 95% of respondents felt more socially connected to their students due to interacting with them on FB. They felt they could have better impressions of their students' personalities when they extended their contact with them to FB. One of the Marketing department's senior lecturers quotes:

> *"I get to know each of my students more and we might even become friends. Since Facebook is a social platform in the first place, it really facilitates for a social bond to happen between staff and students".*

Furthermore, 80% of respondents stated that social discussions outside of class topics do take place on the FB group and are even encouraged by faculty members. Respondents mentioned that sometimes they become more casual in communicating with their students and might greet them on occasions like holidays and their birthdays.

The analysis of responses indicates that student to faculty social interaction is supported and carried out by FB and its features. This corresponds to the findings discussed in Chapter 5 that conveyed the students' perspective of the CoI presences. Results showed a significant positive relationship between students' intensity of Facebook usage and the social presence, as part of the learning experience.

Moreover, respondents observed that student-to-student interaction is also being reinforced by FB. Students help each other with assignments, problems, questions and group projects. They get to know each other more and collaborate more.

6.5.2   Teaching Presence

When asked about how they use FB features to facilitate teaching the lessons of their courses, 87% of respondents were very positive about the ability of FB to facilitate intellectual discussions. One of the respondents from the accounting department stated that this happens through discussion threads, where students solve problems together, and this is a very successful method that works out fine for her. Another respondent from BIS department added that in case text communication does not really convey what she wants to say, she sometimes posts voice messages, and this is due to the practical nature of the course she teaches.

More than 90% of respondents agreed that Facebook helps contribute to the achievement of the course intended learning outcomes (ILOs).

Moreover, respondents also stated that students might also help each other in answering questions and start discussions that contribute to improving their knowledge and skills.

6.5.3   Cognitive Presence

When asked to state how face-to-face discussions differ from electronic discussions through Facebook, a senior lecturer at the Finance department had the following opinion:

> *"Face to face communication definitely makes it easier to transfer a specific meaning to students than electronic communication. A student once wanted to discuss her ideas with me and I faced problems trying to understand her and giving her my feedback. She asked me to send her a video recording, but it was not convenient for me to do this at that time."*

This quotation sums up all of the responses the researcher received from all interviewees, as they all agreed that there are communication cues in face-to-face interaction that can never be replaced by electronic asynchronous communication. Furthermore, teaching assistant from the BIS department stated the following:

> *"Electronic communication is more challenging on FB especially for practical courses, like the major courses of my department (BIS), where we have to teach specific software that need real time step by step instructions."*

This brings up the same factor that appeared in the teaching presence, which is that the nature of the course taught, either a practical or a theoretical course, does affect whether electronic communication is suitable or not.

A further factor raised by almost 50% of respondents is the differences between the personalities and preferences of different students. Some students respond better to electronic discussions due to shyness, for example, while others prefer face-to-face discussions which they find more comfortable.

All respondents have agreed that the bulk of intellectual discussions take place in face-to-face on-campus discussions and not on Facebook.

This could give a possible explanation why results from the quantitative analysis conducted in Chapter 5 showed a moderate weak correlation between the usage of Facebook and three of the cognitive presence elements that are concerned with intellectual discourse – i.e. exploration, integration, and resolution.

An interesting point that was raised by five respondents is that an exception to what is mentioned above does happen according to the timing within the academic semester. When exam times are approaching, the intellectual discussions do take place on FB because students are at home studying and start asking questions. One of the respondents even mentioned that sometimes students use FB voice call features during exam times to elaborately discuss issues raised on the FB group. As a concluding question, respondents were asked if they thought FB was suitable for intellectual discussions or not, and the response of 100% was no. A lecturer in the Media Management department quoted:

> *"FB is more suitable for light discussions and sharing teaching material. It would fit for this only if voice notes and video recordings are included. Sometimes comments and text communication is just not enough! Because I have faced this already!"*

Table 6.2 shows suggested theme factors that will be triangulated with results from the CoI presences and variables measured through the students' survey presented in Chapter 5.

Table 6.2 CoI theme factors

CoI Presence	Dimension	Meaning
Social	Social Connection	Social connection between faculty and student
	Student Collaboration	Collaboration among students
Teaching	Achieving ILOs	Reaching the course Intended Learning Outcomes
	Nature of the course	Practical versus theoretical nature of the course
	Students participation	Student participation in FB activities
Cognitive	Nature of the course	Practical versus theoretical nature of the course
	Character differences	Student character prefers electronic or face-to-face communication
	Academic calendar	Exam times versus non-exam times
	Affordances used	e.g. writing comments, voice or video recordings

6.6 Theme 3: Learning Management System usage

Out of the 21 respondents, only four still used Moodle, CMT's official Learning Management System, in their coursework. The remaining respondents do not use it anymore and believe that students also do not. When asked about the reasons why Moodle is no longer used, young teaching assistants from various department listed the following disadvantages in comparison with FB.

> *"It is more convenient to use one platform for your personal and college related communication, namely Facebook. Moodle requires authentication every time you use it and this consumes time."*

> *"Moodle has lost its popularity among staff and students; it is not used by either of them any longer."*

> *"Communication is not easy on Moodle; it's just for uploading course content and leaving it there for students to download. It is kind of a dead platform with no appealing interactivity features!"*

> *"It's easier for students to use the FB groups that are officially acknowledged by staff members. Even the course material is now available on FB."*

Many respondents also mentioned that the communication feature of Moodle, namely Moodle Forum, is very boring to use in comparison to FB and how appealing and easy it is to use FB. One of the respondents specialises in website design and mentioned that since she teaches GUI (Graphical User Interface) and usability theories, she believes that Moodle has serious usability problems.

On the other hand, when asked about what they perceived were the advantages of Moodle over FB, teaching assistants of various departments had the following opinions.

> *"Moodle is much organised when it comes to course material upload, FB doesn't support multiple file upload and it takes time if I need to share many files on the group".(TA at the BIS department)*

> *"The course page is sectioned into weekly sessions, which would definitely be great if it was available on FB".*

> *"It has an assignments uploading feature with the option of adding a deadline for upload. I can easily add grading to each assignment. Every student will later know his grade privately, and this applies to exam grades as well".*

These advantages are more focused on the LMS features that Moodle has and FB does not really offer explicitly, but rather FB affordances are used indirectly to act the same.

Such features are like the organisation of course content under specific categories. A faculty member with a teacher role on Moodle can create an assignment and grade it, as well as adding grades for other assessments throughout the semester.

An affordance was outlined by Gibson (1977) who proposed an interactionist perception of an object's features and action. An affordance was later defined by Hartson (2003) as "an attribute of an interaction design feature that is what that feature offers the user, what it provides or furnishes" (p. 316).

Table 6.3 provides a summary of the theme dimensions that will be further discussed in Chapter 7, when compared with outcomes of previous studies in the field, as well as findings from the other methods in this thesis.

Table 6.3 Theme 3 dimensions

Dimension	Meaning
Convenience	Being useful, easy and suitable
Availability	The ability for students and faculty members to reach each other at any given time or place
Popularity	Frequency of Moodle being used by faculty members and students
Usability	Ease of using the features of an application through its interface design
Communication Affordances	Communication features that Moodle offers (Moodle Forum)
Assignments and Grading Affordances	Moodle offers a feature to grade the ongoing semester assessments as well as adding assignments and grading them.
Privacy	Every student only views his own grades
Content Management	Organising course content session by session or week by week

Diagram 6.7 sums up all the dimensions derived from the faculty members interviews.
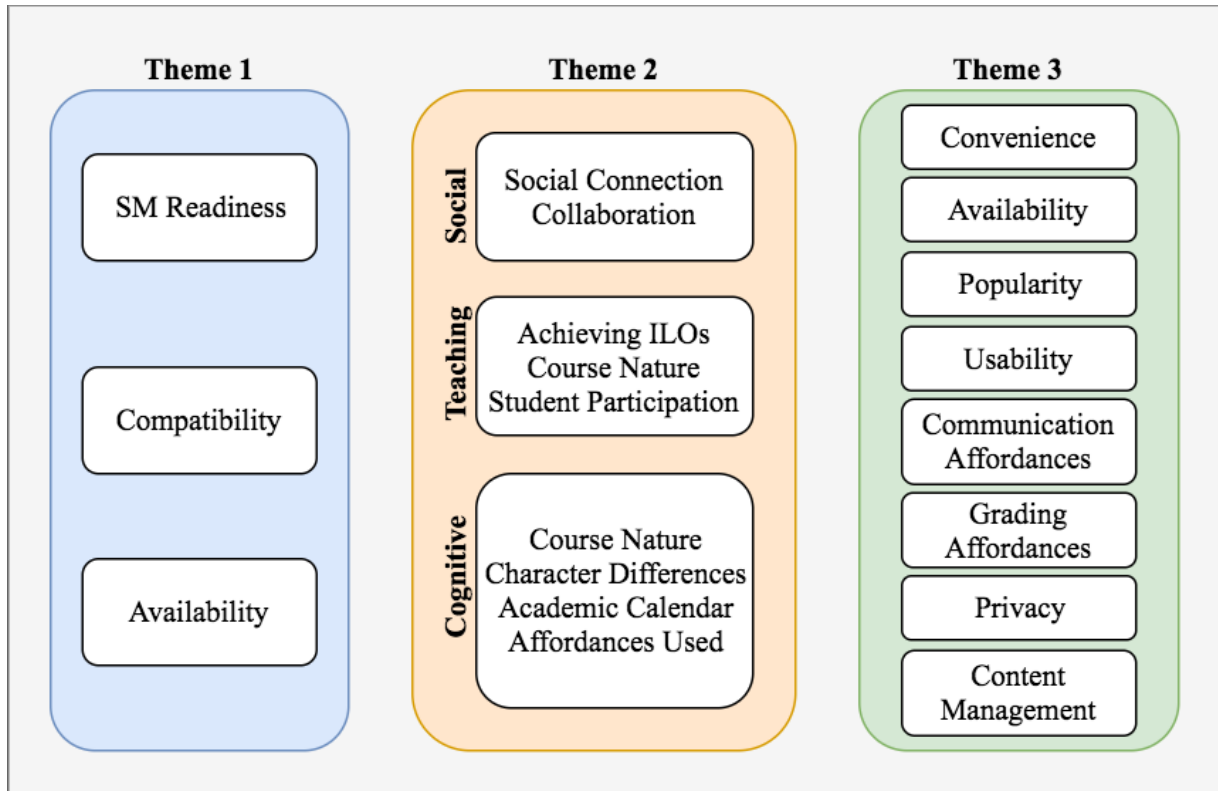
Figure 6.7 Theme dimensions summary

6.7 Student Focus Groups Analysis

This section discusses the results of the focus groups conducted with CMT students after conducting the content analysis and faculty interviews. A total of five focus group discussions were conducted; each session included six students. The researcher acted as the session moderator to ask about the dimensions derived from the previously conducted data collection methods. The discussions were transcribed and thematic analysis yielded the themes discussed in the following sections.

6.8   Theme 1: Communication

The content analysis performed in stage one suggested that the FB group was used as a notification centre, for various categories of course-specific or college-wide notifications. When asked about this, students at the focus group discussions confirmed that this is what they think is one of the roles that FB plays.

Facebook has the affordances and is more accessible for students to use because they already use it for their personal social interaction with friends and family. Now it is also used for their college activities. Furthermore, in contrast with findings of the content analysis of FB posts, comments, and activities in stage 1 of the study, tagging was confirmed by most students as an implicit way of communication.

Students stated that whenever they have an enquiry or a college-related question, they ask it on FB because they are certain that they would get responses; either from other students or course instructors. They agreed that there is a timeliness feature that FB offers, that would not be possible if an LMS like Moodle were used.

6.9   Theme 2: LMS

When asked about how FB is integrated with their educational activities at CMT, the majority of students supported what was already suggested in the previous three stages of analysis. Facebook is currently used instead of Moodle because of its convenience, availability and usability.

Students favour using Moodle as a traditional LMS only in features such as course material organisation and confidential grading. Otherwise, for communication and interaction with

their student friends and teachers, they preferred FB and all the affordances it offers such as tagging, liking and emotions. A further reason was the availability and how they can easily reach their course instructors at any time.

Students preferred for course material to be managed and organised on Moodle, as well as the un-used grading affordance in Moodle, that preserves their privacy in knowing their own grades.

Chapter 7 – Discussion and Conclusion

The current chapter summarises the whole thesis through reflecting upon research aims and objectives and answering the research questions proposed in Chapter 1. Additionally, it discusses the findings of the qualitative and quantitative analysis in contrast with that of previous studies and presents both the theoretical and practical contributions of the study. Subsequently, the chapter suggests recommendations for higher education stakeholders on how to use SNS as part of the education process, and finally the research limitations and future work are discussed.

7.1   Overview of the study

The main purpose of the study was to have a comprehensive holistic understanding of how SNS in general, and Facebook specifically, are used in the field of higher education to support the class activities and/or educational experience of undergraduate students.

By answering the research questions, the researcher was able to contribute to knowledge and practice and develop a list of recommendations that would help higher education academics and professionals integrate SNSs such as Facebook into the educational process, utilising the advantages and avoiding the disadvantages.

The main research questions are introduced in Chapter 1, and were sought in the subsequent chapters. After fulfilling the aims and objectives of the study throughout the thesis, the following sections present the answers to the three main research questions below:

RQ1:   How do faculty and students view and use SNS in higher education institutions?

RQ2:   How does using SNS affect the educational and social experience in higher education institutions?

RQ3:   What are the opportunities and challenges facing SNS, as a learning tool, in higher education institutions?

7.2   RQ1: Facebook Usage

The first research question aimed to explore how undergraduate students used SNS in their coursework and college related activities. In this study Facebook was selected as the most commonly used SNS at CMT AAST, where the study took place. Multiple data collection and data analysis methods were used to answer this question. After triangulating the results from the FB interaction content analysis, the student survey, faculty interviews, and student focus groups, the following findings were identified.

As the results of the student survey shows, 90% of the sample does use Facebook in their education-related activities at CMT. This number is further supported by 100% of the faculty members that were interviewed and stated that they also do integrate FB within their teaching activities. Therefore, it is concluded that FB is integrated within the education process and commonly used at CMT by both students and faculty members.

However, in a study conducted by Roblyer et al. (2010) to compare university students' and faculty's usage of Facebook, results showed that students are much more likely than faculty to use FB, and are significantly more open to the possibility of using social media technologies to support classroom work. Faculty members were more likely to use more traditional technologies such as email, which is not the case for CMT faculty members who are integrating FB with their teaching and course work. This could be referred to the higher frequency and intensity of Facebook usage by CMT faculty. On the other hand, results of the CMT FB group interaction analysis showed that students wrote 69% of the posts and comments, compared to only 22% by faculty. This indicates that although CMT faculty believe they are active and involved on FB, the activity and participation of students is still substantially higher.

Despite the fact that FB was originally designed for social uses, findings of several studies indicate that it can be successfully used for educational purposes as well (Kumar Sharma et al., 2016; Manasijević et al., 2016a; Pollara and Zhu, 2011; Roblyer et al., 2010).

7.2.1 Activities taking place on Facebook

As a result of the content analysis of the CMT FB group, the types of posts were classified into categories and subcategories. The largest number of posts on the group were enquiries by students, comprising 51% of all posts on the group, followed by announcements by both faculty and other students. Every post had a thread of comments associated with it and showed that there is both social and academic interaction taking place. Therefore, stages 2, 3 and 4 of this study tried to further investigate how students and faculty are using FB features when it comes to education-related activities.

Over 70% of the surveyed students believe that FB helps them keep updated with everything happening at college and is open to answer any enquiry that they would find from other students. 76% of the students under study prefer using their smartphones to access FB because it is more convenient. This corresponds with Vorderer et al. (2016) who stated that "with the availability of mobile smart devices, many adolescents have developed the habit of being online and connected with other users almost all the time".

Kollock (1998) lists nine principles for making virtual communities work, and the first principle is the use of software that promotes good discussion. Therefore, Facebook is the most suitable tool for making a virtual community work (Deng and Tavares, 2013b; Duncan and Barczyk, 2013; Schroeder and Greenbowe, 2009).

7.2.2 Sharing Course Material and Content

It was observed from the analysis of FB group interaction that both students and faculty members share a very large amount of course material such as PowerPoint slides, PDF files, and exercise sheets on Facebook.

More than 60% of the student respondents preferred for the course material to be shared on a more organised platform, as it is inconvenient to retrieve the files using FB files search affordances. On the other hand, a tool like Moodle organises the material according to academic weeks and affordances such as creating folders and sub-folders, as stated by students in the focus groups. Since Moodle is not commonly used at CMT, students and faculty are trapped into using FB for course material sharing.

Although SNS enables the creation of content communities (Kaplan and Haenlein, 2010), in the case of sharing course-related files, the affordances offered by FB for the retrieval of files at any time are not easy or convenient.

A further issue raised under the topic of file and content sharing is the sharing of copyrighted content. Almost all faculty members stated that they share material to students, some of which is course notes or sheets created by the faculty, or sometimes copyrighted material such as book chapters or copyrighted slides. According to Facebook's statement of rights and responsibilities, the ownership of the shared content belongs to the user, but still anyone who has the privilege to access the files can use them in any manner he likes (Facebook, 2015).

Tess (2013) reported findings of a survey about students' perceptions of Facebook utility. The majority of students felt that FB is used for communication with other students, to access notes and materials, and to view the college schedule. Some results of Tess's (2013) study disagree with the study at hand, as they reveal that the majority of survey participants anticipated that activities less likely used were online discussions, which included the instructor, and general communication with the instructor (Tess, 2013).

7.2.3   Privacy Issues

Furthermore, the result of the online interaction analysis showed that faculty members usually post students' grades publicly for other members of the group to see. When asked about this in the questionnaires, more than 60% of respondents preferred not being notified with their grades publicly on FB. This was later confirmed by results of the focus group

discussions with students, where the majority of students found that their privacy was being invaded; and grades should be disseminated via official formal means, such as Moodle or the college student portal. Bogdanov et al. (2012) agree with the need to handle privacy issues when it comes to student to student and student to faculty interaction on SNS.

When asked about privacy concerns, CMT faculty members mentioned that students always expect to reach them through FB at any time of the day, and this can sometimes be inconvenient. While not explicitly a privacy issue, faculty claimed that the solution for this is only replying to students whenever it is convenient.

Regarding confidential personal information on their FB profiles, both students and faculty agreed that this could be individually handled in Facebook's account privacy settings.

7.3 RQ2: Facebook Usage and the Educational Experience

In this study the students' educational experience over Facebook was evaluated through the Communities of Inquiry Framework, that is in turn comprised of three dimensions, namely teaching, social and cognitive presence (Garrison et al., 2010a). To measure the degree of involvement in Facebook usage, referred to in this study as the Facebook usage intensity (FBUI), the FBI scale was used in the students' survey (Ellison et al., 2007). A hypotheses model was proposed and a total of five hypotheses were tested in Chapter 5.

The first three hypotheses intended to test whether there is a significant relationship between FBUI and the educational experience or not. Since the educational experience consists of three dimensions (teaching, social and cognitive presence), the impact of FBUI was tested for the three of them in hypotheses H1a, H1b, and H1c. As a result, it has been

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found that there is a significant positive impact of FBUI on all three of the educational experience dimensions, as all corresponding P-values are less than 0.05. To be more specific, contribution to Facebook usage intensity is the highest in the case of social presence (R-Squared = 0.357), followed by teaching presence (R-Squared = 0.197), while FBUI had the least contribution to the cognitive presence (R-Squared = 0.044). The low R-squared values of the cognitive and teaching presence could be explained by the noise in the sample data, as previously discussed in Chapter 5. It is difficult to achieve a high R-squared value when testing a model based on the opinions and preferences of people. This is due to the unpredictability of human responses that result in a lot of noise (Wang et al., 2017)

Relevant literature indicates that no previous studies have been found to test the impact of Facebook usage intensity on the educational experience in higher education, conceptualised in Garrison's CoI framework. A study by Hamid et al. (2015) tried to capture educational experience in online social networks but through measuring other variables, such as promotion of critical thinking and peer learning.

An alternative study by Yu et al. (2011), on the other hand, has used the CoI presences to capture the educational experience, but the social network platform where the study took place was not Facebook. Instead, a website was specially designed and developed for the university where the study took place (Yu et al., 2011).

7.3.1   Facebook Usage Intensity and Teaching Presence

(Garrison and Arbaugh (2007) classified the CoI's teaching presence into three variables: i) design and organisation; ii) facilitating discourse; and iii) direct instruction. When the

impact of FBUI on these variables was tested, the results indicated that FBUI had the highest impact on direct instruction (R-squared = 0.228), followed by facilitating discourse (R-Squared = 0.187), while the least is the contribution of FBUI on design and organisation (R-Squared = 0.172).

Even though the R-squared value of 0.187 for facilitating discourse and 0.172 for design and organization are considered low, that still indicates that FBUI as a proposed variable does contribute in the variation of facilitating discourse and design and organization respectively. The low R-squared values of the mentioned variables could be a result of the noise present in the sample data, as discussed previously.

7.3.2   Facebook Usage Intensity and Social Presence

The Communities of Inquiry framework's social presence is classified into three variables: i) affective expression; ii) open communication; and iii) group cohesion. When the impact of FBUI on these variables was tested, the results indicated that FBUI had the highest impact on open communication (R-squared = 0.318), followed by affective expression (R-Squared = 0.300), while the least is the contribution of FBUI was on group cohesion (R-Squared = 0.260).

7.3.3   Facebook Usage Intensity and Cognitive Presence

Garrison and Arbaugh (2007) stated that the Communities of Inquiry framework's cognitive presence consists of four variables: i) triggering event; ii) exploration; iii) integration; and iv) resolution. When the impact of FBUI on these variables was tested, the results indicated that FBUI impacts triggering event the most with an R-squared value of 0.109, followed by integration (R-   Squared = 0.043), then exploration (R-

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Squared = 0.021), and finally FBUI contributed the least in the impact on resolution (R-Squared = 0.009).

Although the noise in the sample data does contribute to the low R-squared values, the values for integration, exploration, and resolution are still extremely low. This indicates that FBUI contributes very little to those three variables that form a large part of the cognitive presence.

Triggering event, the remaining cognitive presence variable, has an R-squared value of 0.109. Despite the fact that the R-squared value is very low, the effect of FBUI on triggering event as a variable of the cognitive presence still exists, as it explains 10.9% of its variation.

Out of all three presences of the educational experience, Facebook usage has the least effect on the cognitive presence that refers to the intellectual engagement with course concepts, and the students' ability to create meaning out of ideas and facts, developing competence through discussion, reflection and application (Garrison et al., 2010a).

Results from an exploratory study by Yu et al. (2011) confirm that instructor's intention and course design are crucial prerequisites for a successful blended higher educational experience. Since blended learning does not simply mean a combination of face-to-face and online communication, instructors need to redesign course materials and tools in order to integrate the best features of face-to-face teaching with the best features of online learning to better enhance knowledge creation, sharing, and improving. These results conform to the results of the study at hand, as it emphasises the importance of the teaching presence in creating and sustaining the educational experience. Shea and Bidjerano (2009) agree with this argument by claiming that the teaching presence plays a central role, and then they provide important insights into how best to integrate the founding elements of an

online community of inquiry.

Garrison et al. (2010a) have observed that a limited number of studies have empirically examined the CoI framework holistically. Instead, most of the studies have focused on a specific presence, namely, social, cognitive or teaching. Whilst the objective of this research was not to explain or justify the interrelated nature of elements within the CoI framework, the results do show that Facebook usage does impact two presences of the CoI framework, namely the social and teaching presence. However, when it comes to the cognitive presence, Facebook's affordances did not satisfy the achievement of their dimensions.

Garrison et al. (2000) claim that the cognitive presence is the element of CoI that is most basic to success in higher education. They define it as the extent to which participants in any particular formation of a community of inquiry are able to "construct meaning through sustained communication" (Garrison et al., 2000). Although this is already considered challenging even in traditional educational settings, it is even more worthy of attention when the medium of communication changes, as in the adoption of Facebook for educational purposes. Cognitive presence is essential for critical thinking, a process that is often presented as the "ostensible" goal of all higher education (Garrison et al., 2000).

Arbaugh (2007) found that the three CoI presences could predict student learning, although the teaching and cognitive presences had greater effects than the social presence, whereas the current study found that, in the case of using Facebook as the communication medium, the intensity of using Facebook had the greatest effect on social presence. Arbaugh (2007) interestingly found that both the social and teaching presence predicted satisfaction with

the online medium of communication. Furthermore, Akyol and Garrison (2010) found significant relationships between teaching and cognitive presences and perceived learning, but this relationship did not exist with social presence. According to Akyol and Garrison (2010), results of the current study would indicate that Facebook as a communication medium does not really support learning itself as much as developing and supporting the social presence of the learning experience. Despite the fact that the three presences were originally proposed to overlap, one of them precedes the others. The teaching presence contains a number of activities that in turn develop the social and cognitive presence. As online learning originally focused basically on instructional activities and behaviour in online discussions (Anderson, 2008), the concept expanded to contain other instructional activities that take place outside the online discussion platform itself, such as designing course materials and providing feedback, e.g. in the form of messages or emails - defined as persistent conversation (Archer, 2010; Garrison et al., 2006; Shea et al., 2005). The design of learning activities, course materials, and given assignments could either limit or support the cognitive presence. "… for example, assignments that require students to define terms will produce very different levels of cognitive engagement and critical thinking than will assignments that require students to diagnose loosely-structured, authentic problems or debate apposition" (Rubin et al., 2013, p. 49). Richardson and Ice (2010) investigated the level of students' critical thinking in online discussions and found that students involved in case analysis discussions and debates could reach higher levels of critical thinking (Cognitive presence integration and resolution variables) than they did if they were participating in discussions of general topics. Moreover, other studies indicate that when the course design and instruction are directed towards effectively supporting the

cognitive presence, this eventually creates "deep" and "higher-order" thinking (Akyol and Garrison, 2011; De Leng et al., 2009). According to the results of stage 2 of the study, Facebook usage did not support the creation of effective cognitive presence, and therefore reduced the chance of reaching higher-order thinking while using FB as a platform for online discussions. Teaching behaviours that welcome students and guide them through discussions as well as giving feedback are proven to support collaboration and interaction among students, hence, developing and increasing social presence (Akyol and Garrison, 2011; Shea et al., 2014).

7.4   Facebook Usage Intensity and Sense of Belonging to Academic Institution

The second hypothesis in the hypotheses model was tested to show if there is a significant relationship between Facebook usage intensity and CMT students' sense of belonging to their academic institution. While the intensity of Facebook usage was measured with the FBI scale developed by Ellison et al. (2007), the sense of self belonging to an academic institution was measured using the psychological sense of school membership (PSSM) scale developed and validated by Goodenow (1993). According to Goodenow (1993), the sense of belonging or psychological membership is "the extent to which students feel personally accepted, respected, included, and supported by others in the educational institution's social environment" (p. 79).

As a result of the tests, it is confirmed that there is a significant positive impact of FBUI on CMT students' sense of belonging, as the corresponding P-value is less than 0.05.

7.5   Facebook Usage Intensity and Connectedness

According to Foster et al. (2017), connectedness is defined as the degree to which individuals or groups are socially close, interrelated, or share resources. As a result of testing the third hypothesis, the impact of FBUI on CMT students' sense of connectedness was positively significant, as the corresponding P-value was less than 0.05.

Furthermore, there was a significant partial mediation of almost all educational experience dimensions between FBUI and sense of belonging to academic institution, as all dimensions partially mediate the assigned relation, except the exploration and integration variables of the cognitive presence.

7.6   RQ3: Opportunities and Challenges Facing SNS Usage in Education

In trying to answer the study's third research question, RQ3, the current section will discuss opportunities and challenges facing the usage and integration of SNSs in higher education institutions. Section 7.6.1 will present and discuss the challenges, followed by Section 7.6.2 that will go through the opportunities available for SNS usage in higher education.

7.6.1   Challenges Facing SNS Usage in Education

Schroeder, Minocha and Schneider (2010) mentioned some of the risks associated with the adoption of SNSs by institutions and individual students. Although some issues such as cyber-bullying, stalking, and spamming have already been noted in previous studies, specific risks within the educational context still need to be regarded (Schroeder et al., 2010). In order to make the most out of the potential uses that SNSs have for educational

usage, and be able to sustainably implement them, educators and other industry stakeholders should be aware of the risks involved. This is in order to take necessary measures to avoid those risks and prospective drawbacks, as they could get as serious as legal implications for the hosting educational institutions. Timonidou (2012) also argues that students usually have different learning styles that could affect their preferences when using SNSs as learning tools. Some students may respond more to different models of instruction, which highlights the significance of modelling education in a way that accommodates all students with their different learning styles (Balakrishnan and Gan, 2016; Voorn and Kommers, 2013).

Balakrishnan and Gan (2016) state that SNSs do encourage learning because of their popularity and the affordances they offer that facilitate sharing ideas, creating online study groups, and supporting interactions between students and instructors. However, it is recommended for SNSs to be integrating into higher education only after setting clear principles and guidelines for their use (Balakrishnan and Gan, 2016). Students' diverse learning styles should be regarded when using SNS tools for learning and educational activities, and are considered a challenge that faces SNS usage in education. Those activities should be designed according to established pedagogical learning theories in order for SNSs to contribute to improving students' learning experience.

Findings of Balakrishnan and Gan's study provide insight into aspects affecting the use of SNSs for learning by mainly focusing on students' different learning styles. Learning styles include the ways how learners acquire knowledge, interact, or respond to stimulation in their learning environments (Balakrishnan and Gan, 2016).

Therefore, it is essential for educators to consider the learning styles of different students in order to effectively use SNS as integrated part of the learning process.

A further challenge that is recognised is the significant role that faculty members play in the integration of SNS into their courses. It is difficult to identify the extent to which Facebook enhanced the CoI and sense of classroom community found in the study, and the extent to which it is due to more engaged faculty. In contrast, Crook et al. (2008) found that faculty members have a "positive attitudinal disposition" because of their involvement and invested time in the process (Crook et al., 2008). Accordingly, when students perceive an effective CoI or an increased sense of connectedness and belonging while using Facebook, as an integrated part of their educational activities, it might be more due to faculty members' attitudes towards learning and teaching than to the use of the SNS. Therefore, if faculty members do not have present interest in their courses, this will hinder the process of students to get motivated and to socially connect and learn.

Findings of the current study as well as findings in the literature agree that Facebook does not have sufficient features for properly organising course materials and files in a way suitable for an on-going course. LMSs allow all the materials needed in one week to be visually grouped on a single page with contiguous placement of all learning elements, which makes it easier for students to find the materials. Such a feature is not currently offered by FB, as it is not specifically designed for running weekly sessions of on-going courses.

7.6.2   Opportunities of SNS Usage in Education

One of Facebook's main opportunities, when it comes to its usage in the educational context, is its support of social discourse through its communication affordances that facilitate discussions and timely interactivity between students and each other, as well as students and instructor. This implies the likelihood of Facebook to overcome some of the e-learning barriers listed in Ali et al.'s (2018) study previously discussed in Chapter 2, namely the difficulty of engaging students online, and the lack of interactivity present in traditional LMSs.

The timeliness of Facebook was one of the factors identified in the qualitative results' themes of the study. This also matches findings of Deng and Tavares's (2013) study where it was found that Facebook supports the sense of community in an online course by offering instant and spontaneous interaction.

Another opportunity is Facebook's user-friendly interface that facilitates performing actions in direct and easy steps. Higher usability is achieved when there is i) a clear indication about how to use a tool based on the design of the web page and the use of instructions and icons; ii) the location of the tools; and iii) the number of clicks needed to take an action (Rubin et al., 2013). Still, these aspects should first be well perceived in order to affect teaching and learning; as only when students and faculty perceive that communication tools are easy to use, does it facilitate their actual use.

Youmei Liu (2010) studied Facebook's capabilities as a substitute or an addition to LMS, and the study participants viewed Facebook as a successful LMS. A limitation of Facebook as a LMS substitute was explained in that it did not support direct uploads of resources in

typical course formats. This problem is currently solved on FB, but still results of the student survey and the focus groups indicate that sharing course material and the organisation of course content is much better handled by LMS than by Facebook's affordances.

Furthermore, Schroeder and Greenbowe (2009) studied the effects of introducing a Facebook group as a course communication tool versus LMS. Schroeder and Greenbowe (2009) noted that the Facebook group's activity was very consistent throughout the semester and that communication patterns taking place are more complex.

According to Wang et al. (2012), SNSs can be used as a learning management system (LMS) because of functions such as making announcements, sharing resources and conducting online discussions. In a study by Hurt et al. (2012), two groups of students were compared; one group used Facebook and the other used traditional LMS. The study reported that the group using Facebook did demonstrate better educational outcomes. Moreover, students are quite open to the idea of using SNSs in education (Roblyer et al., 2010).

Results of the faculty interviews and students' focus groups match results in the literature, where the user-friendly interface and usability of Facebook, as an educational tool for discussion and communication, is highlighted as one of the reasons for its use by students (Junco, 2011; Kazanidis et al., 2018). Moreover, Ozturk (2015) also emphasised that the affordances for handling effective discussions offered by Facebook were preferred over those supported by LMSs. Therefore, as per the findings of this study, one of the essential opportunities of Facebook usage in the educational context is that it offers a very usable

interface for supporting discourse between students and faculty members. As presented in the results of Chapter 6, Facebook offers communication affordances that are available, usable, and convenient. This also agrees with Greenhow and Lewin (2016); Schroeder et al., (2010) and Mazer et al. (2007) who revealed that Facebook facilitates communication, interaction and cooperation, as well as supporting educational efforts with its discussion-oriented features.
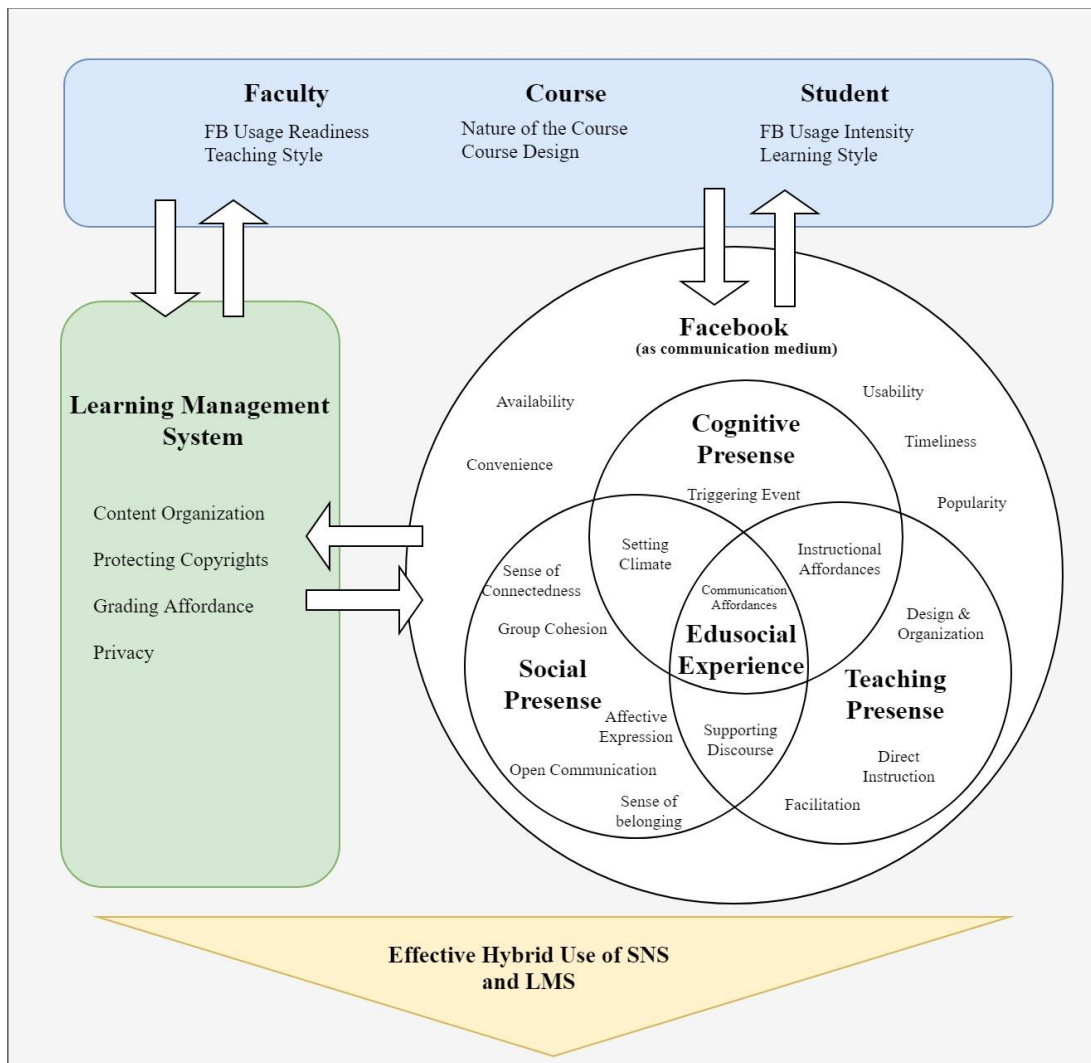
Figure 7.1 Hybrid use of SNS and LMS

Figure 7.1 shows that elements and factors derived from this study form a hybrid model of using SNS (Facebook) in parallel with CMT's used LMS (Moodle). The five key elements are students, faculty, Facebook and LMS usage, and the course being taught. Students' FBUI was proved to positively affect their educational experience, although the learning style of every individual student should be regarded.

The nature of the course and the course design are also important factors that affect the eligibility of the course to be taught over an SNS tool, such as Facebook. When it comes to the faculty member involved in this hybrid model, the teaching style he/she adopts should be possible to integrate with Facebook affordances and nature of communication. Moreover, the faculty member himself ought to be familiar with and have a readiness to use FB.

Usage of LMS is optimum when it comes to grading students anonymously, ensuring privacy, protecting course material copyrights, as well as the organisation of course content in a manner that separates course sessions along the semester.

According to findings of the study, when FB is used as a medium of communication, it satisfies specific elements in each of the three CoI presences. In the teaching presence, FB helps achieve facilitation, direct instruction, and design and organisation. In social presence, FB helps achieve group cohesion, open communication, and affective expression. It also positively affects the sense of connectedness and the sense of belonging of students. However, the cognitive presence is not fully realised when using FB. Only triggering event that initiates students' queries is supported. Instructional affordances of FB partially contribute to the cognitive presence, along with the communication

affordances that help enhance the educational experience.

Properties of Facebook that make it a suitable communication medium in an educational context are its availability, its design usability, its popularity and wide usage, its timeliness and convenience (see Chapter 6).

7.7   Academic Contribution

The study provides a significant addition to the current literature on SNS usage and the educational experience in higher education. As a result of the researcher's review of literature, it has been found that existing studies focus mostly on investigating separate diverse variables (Junco, 2015b; Manca and Ranieri, 2016), while a very limited number have adopted a holistic concept to capture the educational experience in higher education, specifically the CoI framework in association with SNS (Ozturk, 2015; Yu et al., 2011).

All the currently available studies that have used the Facebook intensity scale to measure the intensity of undergraduate students' usage of Facebook in their daily educational activities (Ellison et al., 2007) did not try to measure its effect on the educational experience conceptualised by the CoI framework before.

Furthermore, Facebook usage intensity has not been associated with the sense of belonging to academic institution, measured by the PSSM and the sense of connectedness in any of the literature to date. That further emphasises the importance of this study and its academic contribution to literature in the field.

In a study that intended to review all literature involving using FB as a learning tool, Manca and Ranieri (2016) have performed a statistical analysis of the different features of

FB that have been used or studied in approximately 150 journal articles. Using Facebook API was one of the features they have listed in their FB features classification, but interestingly the number of studies that utilised FB API was zero. This signifies the importance of the study at hand and its contribution to knowledge and practice, as Facebook API was utilised in stage one of the data collection as part of the developed web application. In their study, Manca and Ranieri (2016) suggested some of the research gaps they found in studies of Facebook as a learning tool and mentioned the following:

> *"Many of the studies relied on a generic socio-constructivist theory. Few studies were conducted using a clear theoretical framework or specific hypothesis to test. A clear theoretical framework, along with specific hypotheses to test through suitable methodological approaches, can explain if and why Facebook is an effective tool especially for formal learning."(p. 519)*

In order to fill this gap, the researcher used a clear theoretical framework and specific hypotheses to test if Facebook is an effective learning tool, namely by testing the relationship between Facebook usage and the teaching, social, and cognitive dimensions of the educational experience.

Studies on the usage of Facebook by students and faculty members in the Middle East North Africa region, and Egyptian higher education institutions specifically, are very limited in the literature (Labib and Mostafa, 2015).

This gives this research a substantial weight in exploring the field and acting as a bridge for future studies in the region, as well as other countries and universities.

7.8   Recommendations and Practical Contribution

This thesis contributes to practice by giving recommendations for higher education professionals working in universities and institutions on how to integrate SNS as an informal component of educational activities with the formal components such as traditional LMS, and actual face-to-face communication on campus.

The study sheds light on the drawbacks of using Facebook in course material organisation and copyright issues regarding the content that is shared. Furthermore, student privacy concerns when disseminating course grades are not handled well by faculty members when they publicly announce them on Facebook.

The study recommends using LMS grading and content management affordances that are especially designed for these purposes in parallel with other beneficial uses of Facebook, such as the very commonly used communication affordances that allow timeliness, convenience, and availability.

The study provides insight into how higher education decision makers could develop a SNS usage policy to legitimate its use by both faculty members and students.

This study supports higher education professionals in considering the importance of including SNS in the official channels of communication with students, who are intensely using these tools today, as it was proven that their usage of Facebook did have an effect on the various dimensions of their educational experience.

Finally, the student survey is useful in helping faculty members and college instructors understand students' points of view when it comes to using online tools to complement their learning activities.

Academic institutions would benefit from knowing how using SNS such as Facebook does have a significant impact on their students' sense of belonging and accordingly could retain more students.

The investment in learning a new LMS is significant, and includes the financial burden of obtaining the LMS, time and costs to learn the tools and administer the system, and the cost and effort to train faculty and students how to use it.

In order to benefit from various delivery methods for effectively achieving learning objectives, the blend of face-to-face and online learning is recommended. Using technology for online learning should be applied in a pedagogically appropriate manner, in order to create and maintain highly interactive learning that is socially situated (Vaughan, 2007). A hybrid use of SNS and LMS would be ideal to benefit from the advantages of each of them, when it comes to blended learning.

Continuous evaluation and assessment of blended learning should be ensured in order to guarantee the effectiveness of education. A social network sites usage policy that indicates best practices and legal implications is also encouraged to be developed by institutions.

7.9 Limitations

The study adopted a cross-sectional approach to collecting data. In the future, a longitudinal data collection time horizon could reveal more interesting changes and

patterns in the results. Scialdone (2014) discusses the possibility that several factors may affect the development of community of inquiry, such as the "epistemological stance" of students, and the nature of tasks they are performing. The time variable also plays an important role in understanding how a Community of Inquiry develops and progresses (Garrison and Akyol, 2013).

A further limitation of the study is the noise in the sample data that was revealed by low R-squared values in stage 2 of the data analysis. Statistical noise is defined by Wang et al. (2017) as "unexplained variability within a data sample; the more true noise in the data, the lower the R-Squared" (p. 2).

Noise in the data could be due to unpredictability of human responses. Consequently, it would be difficult to achieve a high R-squared value when building a model based on the stated preferences of people, where there is a lot of noise (Wang et al., 2017). When predictor variables are categorical (e.g., rating scales) or counts, the R-Squared value will typically be lower than with truly numeric data. This is the case with the variables tested in stage 2 of this study, since all questionnaire questions have a 5-point likert scale for respondents to choose from. Therefore, the accuracy of the model could be slightly affected due to having captured insufficient inputs, because of the noise present in the sample data.

In stages 3 and 4 of the data analysis, themed analysis was chosen as the method of analysis. Despite the popularity of this method, data interpretations depend on the researcher's own understanding of interviewee responses. Therefore, the researcher tried to reduce bias by providing a summary of the interviewees' explanations after each interview. This summary helps avoid bias or missing information (Saunders et al., 2008).

Moreover, it gives a chance for both the interviewer and interviewee to review the interpretation and make any necessary corrections.

After the study had been conducted, it was realised that the faculty interviews sample represented mostly young faculty members. Therefore, older faculty age groups should be further investigated because this might yield interesting results.

7.9.1 Generalisation of Case Studies

In a comprehensive literature review by Wikfeldt (2016), aiming to answer to what extent generalisation is possible, she states that Yin (2012) believed that analytic generalisation is inferior to statistical generalisation, when dealing with case studies. Accordingly, we can only generalise from a few cases. "Contrary beliefs, such as the small-N problem, declare that the very nature of the case study, with small samples, makes it invalid for generalisation" (Wikfeldt, 2016, p. 8).

Kennedy states that when generalising case study results, researchers must adopt a high level of accuracy and caution to succeed. This is due to the lesser extent of evaluation rules (Kennedy, 1979), the risk of the case not being representative (Gerring, 2004), and probability of biased and subjective influences that interfere with the researcher in the analysis (Firestone, 1993).

In order to justify generalisation, it must be done carefully and with much consideration. It is unfitting to generalise case studies to a population, and eligible to generalise it to theory (Yin, 2012).

Hence, it can be suggested that "All swans are white" is not a suitable inference to case research.

> *"Since it is falsifiable (Popper, 1982), we cannot be confident that all swans in the world are white in color. What we can say is: since this case study shows that this swan is white, other cases of swans are likely to be white as well. Accordingly, we build a theory that states swans are white. When we conduct other studies on swans, we will likely get results confirming the theory's premises; results which will reinforce the strength of the theory's validity. It is also possible for us to find unique cases, such as swans that are black, brown, or pink, even; which in turn will undermine the theory, disconfirming it. Through the course of the research, the theory will develop, change multiple times, and perhaps be completely dismissed in the end. Ultimately, what is going to be the determining factor of the theory's fate is whether or not it represents reality" (Wikfeldt, 2016, p. 8).*

This process can be linked to the idea that case study helps in building theory and hypotheses by finding confirming or disconfirming results, as stated in Cronbach (1975), Firestone (1993), Kennedy (1979), Ruddin (2006), Woodside (2010), and Yin (2012).

Wikfeldt (2016) listed another objection, i.e. that generalisation is an "unsound" way of stating inferences, and that, instead, we should strive to use particularisation to a greater extent. She suggests that the unique case is valuable in its own way, in spite of being non-statistical (Kennedy, 1979).

Simons (2015) states that case studies are the study of the particular. And particularisation, in turn, is the one and only way of judging something of its true nature. With these statements in mind, it might be possible to suggest that the case study is the optimal way of studying the world, according to Wikfeldt. Nevertheless, mankind is found to constantly seek generalised answers in the surroundings. Perhaps there is a need to generalise, even though it may seem a non-optimal decision.

Finally, despite the discrepancy in literature, it still suggests that case studies can be generalised close to the same extent as statistical studies, if conducted correctly (Wikfeldt, 2016).

7.10 Directions for Future Work

An aspect that future studies need to take into account is how cultural differences between countries affect the tendency to adopt Facebook for learning and the ways students react to their use in education in relation to several cultural variables. According to the literature review conducted by Manca and Ranieri (2016), "Only a few studies reported how cultural variables influence students' learning: power relations between students and their teacher; religious beliefs and topics related to ethnicity; individual-based and collective-based cultures.

Cultural issues deeply influence how students perceive and manage their participation in Facebook-led learning experiences." (p. 518).

Balakrishnan and Gan (2016) discussed how individual students' learning style could affect their tendency to use SNS for learning activities or whether they benefit from using them or not. The learning styles of students according to the different learning theories are worth exploring in future research to extend the current work.

There are many technical enhancements that could be added to the web application that was developed in stage 1 of this study, such as involving social network analysis theories and trying to automate the content analysis process.

Although this will direct the work more to computer science topics such as natural language processing (NLP) and sentiment analysis, it would be very interesting to explore how this could extend the study at hand.

The stakeholders researched in this study are undergraduate students and faculty members; future research could extend to include more higher education stakeholders such as administrative staff and post-graduate students.

Moore (1989) proposed three different types of interactions for an educational environment: student–student, student–instructor and student–content. A review of previous studies shows that there is no research on student–content interaction in SNSs. Moore (1989) described student–content interaction as "the process of intellectually interacting with the content that results in changes in the learner's understanding, the learner's perspective, or the cognitive structures of the learner's mind" (p. 2).

This study also found that Facebook-enhanced courses contribute to students' social dimension of learning, and to a lesser extent, the cognitive dimension. Future research should further investigate how Facebook could impact the cognitive side of learning, in order to enhance understanding of the value of SNS as an instructional technology.

7.11 Conclusion

Since the Communities of Inquiry framework was originally designed to address text-based discussion boards (Garrison et al., 2010b), results of this study show that Facebook as a computer-based communication medium is rich enough to play a role in impacting the teaching and social dimensions of the educational experience. Therefore, if the CoI framework is to be appropriately applied across SNS, it should expand to include more

features than text-based discussions to satisfy the requirements of the cognitive dimension of the educational experience. For this to happen, other factors such as faculty member privacy are to be sacrificed.

Therefore, this study suggests a hybrid model of using social networking sites as formal channels of communication in parallel with learning management systems that are already the official learning tools adopted by academic institutions in higher education. This is to benefit from the advantages of SNS and LMS, while trying to avoid their drawbacks.

Findings of the current study provide important implications for educational software designers, instructors, as well as researchers who are interested in enhancing online communication or using social networking software for learning.

The main emphasis of the CoI framework is to create an effective learning community that enhances and supports deep approaches to learning. This research explored how Facebook's usage, as a blended learning tool, affected the educational experience measured by the CoI dimensions.

In recent years, many universities have changed their LMS in order to use systems with affordances to support teaching and learning in an improved way. Yet, newer systems are continually under development. This study provides evidence that such efforts may be worthwhile. Developments in communication technologies pave the way for restructuring the social structure. Novelties in these technologies influence the field of education as well. It is promising to say that education has been restructured due to Web 2.0 technologies such as Social Networking Sites.

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Appendix A

Qa

School of Management, Cardiff Metropolitan University

STRUCTURED QUESTIONNAIRE

Social Networking Sites and the Edu-social Experience in Higher Education Institutions

Dear Respondent,

You are invited to participate in our survey about Social Networking Sites in Higher Education. Please complete each question by either putting your answer in the space provided or circling the appropriate response. Submission of the questionnaire will be taken as voluntary informed consent. Your survey responses will be strictly private and data from this research will be reported only in the aggregate. Your information will be coded and will remain confidential.

Thank you in advance for taking the time to complete this survey.

The researcher
Nourhan Hamdi,
Cardiff Metropolitan University
St10004548@outlook.cardiffmet.ac.uk

PART I: FACEBOOK USAGE

    1. Do you have a Facebook Account?
    ☐ Yes
    ☐ No

* If your answer to question 1 is no, please proceed to Part IV on the last page.

Section 1: Facebook Usage Intensity (Ellison, N. B., Steinfield, C., & Lampe, C. (2007))

    2. Approximately how many total Facebook friends do you have?
    ☐ 1 – 300 friends
    ☐ 301 – 600 friends
    ☐ 601 – 1000 friends
    ☐ More than 1000 friends

    3. How much time do you spend on Facebook daily?
    ☐ Less than half an hour
    ☐ Half an hour – less than 1 hour
    ☐ 1 hour - 2 hours
    ☐ More than 2 hours

Please respond to the following from 1 = strongly disagree to 5 = strongly agree	1	2	3	4	5
4. Facebook is part of my everyday activity					
5. I am proud to tell people I'm on Facebook					
6. Facebook has become a part of my daily routine					
7. I feel out of touch when I don't log onto Facebook.					
8. I feel I am part of the Facebook community					
9. I would be sorry if Facebook shut down					

Section 2: Facebook Group and Moodle:

10. Are you a member of the CMT official FB group or any other CMT educational group?

☐ Yes
☐ No

- *If your answer to question 10 is no, please proceed Part IV on the last page.*

Please respond to the following from **1 = strongly disagree** to **5 = strongly agree**	1	2	3	4	5
11.	I usually access the group using my mobile Facebook application.					
12.	It is more convenient for me to access the group via my mobile phone.					
13.	If I have an enquiry, I would ask it on the group.					
14.	If I see an enquiry post that I know the answer to, I would immediately reply.					
15.	I prefer receiving course material via the FB group.					
16.	It is easy to search for the posted course material on the FB group.					
17.	I prefer being notified with course withdrawal warnings on the FB group.					
18.	I prefer to see my course grades posted on the Facebook group.					
19.	The FB group helps me keep updated with all what is happening at CMT.					
20.	At the beginning of every semester I make sure to enrol my courses on CMTs Moodle website					

21.	I regularly access the CMTs Moodle website throughout the semester.					
22.	I prefer accessing Moodle from a computer browser					
23.	It is more convenient to access Moodle using my mobile phone.					
24.	I'd rather find the course material organized on Moodle than having to search for it myself on the CMT FB group.					
25.	I prefer receiving my course grades privately on Moodle than have them posted publically on the CMT FB group.					
26.	My instructors regularly use Moodle.					
27.	I prefer using the Moodle forum option to interact with my instructors and classmates rather than the FB group.					

PART II: COMMUNITIES OF INQUIRY QUESTIONS (COI):

Based on your experience on the college Facebook group, and interaction with instructors and other students, please respond to the following questions.

Section 1: Teaching Presence

Please respond to the following from **1 = strongly disagree** to **5 = strongly agree**	1	2	3	4	5
Design & Organization					
28. The instructor clearly communicates important course topics on the FB group.					
29. The instructor clearly communicates important course goals on the FB group.					

No.						
30.	The instructor provides clear instructions on how to participate in course learning activities					
31.	The instructor clearly communicates important due dates/time frames for learning activities.					
32.	The instructor is helpful in identifying areas of agreement and disagreement on course topics that helped me to learn.					
Facilitation						
33.	The instructor is helpful in guiding the class towards understanding course topics in a way that helped me clarify my thinking.					
34.	The instructor helps in keeping course participants engaged and participating in productive dialogue.					
35.	The instructor helps in keeping the course participants on task in a way that helps me to learn.					
36.	The instructor encourages course participants to explore new concepts in this course.					
37.	Instructor actions reinforce the development of a sense of community among course participants.					
Direct Instruction						
38.	The instructor helps to focus discussion on relevant issues in a way that helps me to learn					
39.	The instructor provides feedback that helps me understand my strengths and weaknesses.					
40.	The instructor provides feedback in a timely fashion.					

<u>Section 2: Social Presence</u>

Please respond to the following from **1 = strongly disagree** to **5 = strongly agree**	1	2	3	4	5
Affective Expression					
41. Getting to know other course participants gives me a sense of belonging in the FB group					
42. I am able to form distinct impressions of some course participants					
43. Online or web-based communication is an excellent medium for social interaction					
Open Communication					
44. I feel comfortable conversing through the FB group					
45. I feel comfortable participating in the course discussions					
46. I feel comfortable interacting with other course participants					
47. I feel comfortable disagreeing with other course participants while still maintaining a sense of trust					
Group Cohesion					
48. I feel that my point of view was acknowledged by other course participants on the FB group.					
49. Online discussions help me develop a sense of collaboration.					

Section 3: Cognitive Presence

Please respond to the following from **1 = strongly disagree** to **5 = strongly agree**	**1**	**2**	**3**	**4**	**5**
Triggering Event					
50. Problems posed on the FB group increased my interest in course issues.					
51. Course activities on the FB group intrigued my curiosity					
52. I feel motivated to explore content related questions on the FB group					
Exploration					
53. I utilize a variety of information sources to explore problems posed on the FB group					
54. Brainstorming and finding relevant information on the FB group helped me resolve content related questions.					
55. *Discussions on the FB group were valuable in helping me appreciate different perspectives*					
Integration					
56. Combining new information helped me answer questions raised in course activities.					
57. *Learning activities on the FB group helped me construct explanations/solutions.*					
58. *Reflection on course content and discussions on the FB group helped me understand fundamental concepts in this class*					
Resolution					
59. I can describe ways to test and apply the knowledge created in this course					

60.	I have developed solutions to course problems that can be applied in practice					
61.	I can apply the knowledge created in this course to my work or other non-class related activities					

PART III: SOCIAL THEORY QUESTIONS

Section 1: Sense of self-belonging to the CMT FB group (adopted and adapted from PSSM Scale):

	Please respond to the following from **1 = strongly disagree** to **5 = strongly agree**	**1**	**2**	**3**	**4**	**5**
62.	**I feel like a real part of the FB group.**					
63.	**I am treated with as much respect as other students on the FB group.**					
64.	**The instructors on the FB group respect me.**					
65.	**There's at least one faculty at FB group that will respond to my post if I have a problem.**					
66.	**Other students on the FB group take my opinions seriously.**					
67.	**I can really be myself while posting on the FB group.**					

Section 2: Sense of Connectedness

	Please respond to the following from **1 = strongly disagree** to **5 = strongly agree**	**1**	**2**	**3**	**4**	**5**
68.	Students in the FB group care about each other					

69.	This FB group is like a family					
70.	I do not feel isolated on the FB group					
71.	I can rely on others in the FB group					
72.	I am overall satisfied from using the FB group as part of my learning activities at CMT					

PART IV: PERSONAL DETAILS

73. Academic semester:

☐ **1** ☐ **2** ☐ **3** ☐ **4** ☐ **5** ☐ **6** ☐ **7** ☐ **8**

74. Gender:
☐ Male
☐ Female

75. CMT Department:
☐ Marketing Management
☐ Media Management
☐ Business Information Systems
☐ Finance
☐ Accounting

Ia

PARTICIPANT INFORMATION SHEET

School of Management, Cardiff Metropolitan University

Social Networking Sites and the Edu-Social Experience in Higher Education

Institutions

I would like to invite you to take part in a research study. Before you decide you need to understand why the research is being done and what it would involve for you. Please take time to read the following information carefully. Ask questions if anything you read is not clear or would like more information. Take time to decide whether or not to take part.

Project summary

The purpose of this research project is to understand how students in the higher education sector are affected when Social Networking Sites is integrated in their educational and learning activities. Your participation will enable the collection of data, which will form part of a study being undertaken at Cardiff Metropolitan University.

Why have you been asked to participate?

You have been asked to participate because you fit the profile of the population being studied; that is you are one of the instructors at CMT AAST Alexandria and using the CMT Facebook group to interact with students, as a supplement to your face-to-face classes. Your participation is entirely voluntary and you may withdraw at any time.

Project risks

The research involves the participation in an interview that will be recorded for later analysis. We are not seeking to collect any sensitive data on you; this study is only concerned with your opinions on the Facebook groups usage in teaching your courses. We do not think that there are any significant risks associated with this study. However, if you do feel that any of the questions are inappropriate then you can stop at any time. Furthermore, you can change your mind and withdraw from the study at any time – we will completely respect your decision.

How we protect your privacy

All the information you provide will be held in confidence. We have taken careful steps to make sure that you cannot be directly identified from the information given by you. Your personal details (e.g. signature on the consent form) will be kept in a secure location by the researcher. When we have finished the study and analysed all the information, the documentation used to gather the raw data will be destroyed except your signed consent form which will be held securely for 10 years. The recordings of the interview will also be held in a secure and confidential environment during the study and destroyed after 10 years.

YOU WILL BE OFFERED A COPY OF THIS INFORMATION SHEET TO KEEP

If you require any further information about this project then please contact:

Nourhan Hamdi, Cardiff Metropolitan University

Cardiff Metropolitan University email: st10004548@outlook.cardiffmet.ac.uk

Ib

School of Management, Cardiff Metropolitan University

PARTICIPANT CONSENT FORM

Title of Project: Social Networking Sites and the Edu-Social Experience in Higher Education Institutions

Name of Researcher: Nourhan Hamdi

Study Ref. No.:

_____

Participant to complete this section: **Please initial each box.**

1. I confirm that I have read and understand the information sheet for the above study.
    I have had the opportunity to consider the information, ask questions and have had
    these answered satisfactorily.   [   ]

2. I understand that my participation is voluntary and that I am free to withdraw at any
    time, without giving any reason.   [   ]

3. I agree to take part in the above study.   [   ]

4. I agree to the interview being recorded   [   ]

                                                               Yes   No

5. I agree to the use of anonymised quotes in publications   [   ] [   ]

_____   _____

Signature of Participant   Date

_____   _____

Name of person taking consent   Date

_____

Signature of person taking consent

Ic

School of Management, Cardiff Metropolitan University

SEMI-STRUCTURED INTERVIEW

Social Networking Sites and the Edu-Social Experience in Higher Education

Institutions

Order of Semi-Structured Interview
1) Ask respondent for approval to use recording systems **Ask respondent to sign and acknowledge consent form**
2) Ask background questions
- Respondents' age and gender   - Respondents' academic department   - Respondents' position   - Years working at CMT AAST   - Academic degree
3) Discuss social media readiness
Do you think you have the knowledge and skills to use social media for personal and professional purposes?

4) Discuss experience with using social media (CMT Facebook group) in class activities

- Do you think social media is compatible and fits well with the way you teach?

- What is your general experience with using social media for class activities?

- How do you use the CMT FB group to supplement your class activities?

- What do you think are the advantages and disadvantages of using the CMT FB group?

- Do you post student grades and/or withdrawal warnings publically on the FB group?

- Have you ever shared copyrighted course material on the FB group?

- What devices do you usually use to access Facebook?

5) Discuss CoI "Social Presence" based on FB group interaction

- Is it important to you to feel socially connected to your students?

- Do you feel that you have an accurate impression of the students' personalities?

- On the FB group, do you do anything to facilitate social discourse, or encourage students to get to know you beyond the boundaries of class topics?

6) Discuss CoI "Teaching Presence" based on FB group interaction

- In your experience, what is the best way for an instructor to facilitate intellectual discourse?

- How do you convey to students what you expect of them? (Learning outcomes and expectations)

7) Discuss CoI "Cognitive Presence" based on FB group interaction

- Does discourse differ between face-to-face discussions and those that happen electronically on the FB group? If yes, then how?

- Where does the bulk of intellectual discussions typically take place, and why?

- What are your thoughts on the ability of social media to support and sustain intellectual discourse?

8) Discuss Moodle (CMT LMS) usage
• Do you use Moodle (CMT LMS) to supplement your teaching activities?
• What do you believe are the advantages of Moodle, in comparison to FB group usage?
• What do you believe are the disadvantages of Moodle, in comparison to FB group usage?
9) Discuss student learning outcomes through using the FB group
• Has using the FB group in parallel with the regular classroom improved the student learning outcomes in your class (In terms of knowledge and skills)?
• Did using the FB group in parallel with the regular classroom cause your students to participate, contribute and learn more?
• Did using the FB group enable you to know your individual students more?
10) Discuss student satisfaction
• Do you believe that using social media in your teaching activities has increased the students' satisfaction with your course?
• Do you think that students are more satisfied with student-to-student interaction due to social media use in your teaching?
• Do you think that students are more satisfied with student-to-faculty interaction due to social media use in your teaching?
11) Discuss perceived risk
• Do you feel that social media tools are difficult to use in teaching (Taking the class out of control/ taking up too much time)?
Thank respondent and ask whether he wishes to add any further opinions related to the discussion topics.

FGa

PARTICIPANT INFORMATION SHEET

School of Management, Cardiff Metropolitan University

Social Networking Sites and the Edu-Social Experience in Higher Education Institutions

I would like to invite you to take part in a research study. Before you decide you need to understand why the research is being done and what it would involve for you. Please take time to read the following information carefully. Ask questions if anything you read is not clear or would like more information. Take time to decide whether or not to take part.

Project summary

The purpose of this research project is to understand how students in the higher education sector are affected when Social Networking Sites is integrated in their educational and learning activities. Your participation will enable the collection of data, which will form part of a study being undertaken at Cardiff Metropolitan University.

Why have you been asked to participate?

You have been asked to participate because you fit the profile of the population being studied; that is you are a student at CMT AAST Alexandria and using the CMT Facebook group as a supplement to your regular physical classes and to interact with your classmates and course instructors in the educational context. Your participation is entirely voluntary and you may withdraw at any time.

Project risks

The research involves the participation in a focus group discussion that will be recorded for later analysis. We are not seeking to collect any sensitive data on you; this study is only concerned with your opinions on the Facebook group usage when it comes to your educational and learning activities within the boundary of CMT AAST. We do not think that there are any significant risks associated with this study. However, if you do feel that any of the discussion topics are inappropriate then you can stop at any time. Furthermore, you can change your mind and withdraw from the study at any time – we will completely respect your decision.

How we protect your privacy

All the information you provide will be held in confidence. We have taken careful steps to make sure that you cannot be directly identified from the information given by you. Your personal details (e.g. signature on the consent form) will be kept in a secure location by the researcher. When we have finished the study and analysed all the information, the documentation used to gather the raw data will be destroyed except your signed consent form which will be held securely for 10 years. The recordings of the interview will also be held in a secure and confidential environment during the study and destroyed after 10 years.

YOU WILL BE OFFERED A COPY OF THIS INFORMATION SHEET TO KEEP

If you require any further information about this project then please contact:

Nourhan Hamdi, Cardiff Metropolitan University

Cardiff Metropolitan University email: st10004548@outlook.cardiffmet.ac.uk

FGb

**School of Management, Cardiff Metropolitan UniversityPARTICIPANT CONSENT
FORM**

Title of Project: Social Networking Sites and the Edu-Social Experience in Higher
Education Institutions

Name of Researcher: Nourhan Hamdi

Study Ref. No.:

_____

Participant to complete this section: **Please initial each box**

6. I confirm that I have read and understand the information sheet for the above
   study.
   I have had the opportunity to consider the information, ask questions and have
   had these answered satisfactorily.   [   ]
7. I understand that my participation is voluntary and that I am free to withdraw at
   any time, without giving any reason.   [   ]
8. I agree to take part in the above study.   [   ]
9. I agree to the focus group being recorded   [   ]

                                                    Yes   No

10. I agree to the use of anonymised quotes in publications   [   ]   [   ]

_____   _____

Signature of Participant   Date

_____   _____

Name of person taking consent   Date

_____

Signature of person taking consent

FGc

FOCUS GROUP DISCUSSION

Social Networking Sites and the Edu-Social Experience in Higher Education Institutions

Order of Focus Group Discussion
Welcome all participants and introduce project title and myself.
Ask participants for their approval on using recording systems, and ask them to sign and acknowledge the consent forms.
1. How is SNS (Facebook) used in your educational activities at CMT (By you, your colleagues and your instructors)?
2. In your opinion, what are the benefits of using SNS (Facebook) in your learning and college activities?
3. What do you believe are the disadvantages of using SNS (Facebook) in your learning and college activities?
4. How is Moodle (CMT LMS) used in your educational activities at CMT (By you, your colleagues and your instructors)?
5. Are you generally satisfied by how Moodle (CMT LMS) is used at CMT? Why?
6. How would you evaluate the Facebook features used in your learning activities versus the features offered by Moodle (CMT LMS)?
7. Are you overall satisfied from the use of Facebook groups in parallel with your face-to-face educational activities at CMT? Why?
8. What does Facebook offer, that neither Moodle nor face-to-face interaction can offer, in the context of your educational experience at CMT?
Thank participants and ask them if they wish to add any further opinions related to the discussion topics.