

A Framework for implementing Social Computing in Higher Education in the Gulf States

Khaled A. Hussein

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A Framework for implementing Social Computing in Higher Education in the Gulf States

Khaled A. Hussein

School of the Built Environment
University of Salford, Manchester, UK

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FRAMEWORK FOR IMPLEMENTING SC IN HE IN GULF STATES

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Dedication

This Thesis is dedicated to Soha, Mohamed and Ali

Thesis contains DVD

Declaration of Originality by Postgraduate Candidate

This is to certify that the copy of my thesis, which I have presented for consideration for my postgraduate degree: -

1. Embodies the results of my own course of study and research
2. Has been composed by myself
3. Has been seen by my supervisor before presentation

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Acronyms

BI	Behaviour Intention
BNT	Basic Needs Theory
CET	Cognitive Evaluation Theory
CFA	Confirmatory Factor Analysis
COT	Causality Orientation Theory
CPU	Central Processing Unit
CRM	Customer Relationship Management
CSE	Computing Self-Efficacy
ED	Embracing Diversity
DOI	Diffusion Of Innovations
DTPB	The Decomposed Theory Of Planned Behaviour
EIS	Executive Information System
FC	Facilitating Conditions
GCSE	General Computing Self-Efficacy
HE	Higher Education
ICT	Information and Communication Technology
IM	Instant Messaging
IM, EM	Internal Motivation, External Motivation and
IT	Information Technology
LA	Learning and Achieving
MM	The Motivational Model
MPCU	Model of PC Utilization
MPCU	The Model of PC Utilization
NMC	New Media Consortium
OCS	Online Course System
OIT	Organismic Integration Theory
OLAP	On-line Analytical Processing Technology
OSSW	Open Source Software Watch
PBC	Perceived Behavioural Control
PC	Personal Computer
PEOU	Performance; and Perceived Ease of Use
PIIT	Personal Innovation in Information Technology
PU	Perceived Usefulness
RAM	Random Access Memory
SC	Social Computing
SCT	The social Cognitive Theory
SE	Self-Efficacy
SEM	Structural Equation Modelling
SLT	The Social Learning Theory
SN	Subjective Norms
SSE	Software-Specific-Self-Efficacy
SW	Software
TAM	The Technology Acceptance Model
TPB	Theory of Planned Behaviour

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Acronyms (Cont'd)

TRA	Theory of Reasoned Action
UAE	United Arab Emirates
UAEs	User Acceptance Enablers
UAEU	United Arab Emirates University
UTAUT	the Unified Theory of Acceptance and Use of Technology
VLE	Virtual Learning Environment
VPN	Virtual Private Network

FRAMEWORK FOR IMPLEMENTING SC IN HE IN GULF STATES

Abstract

This study sets out to develop a framework for implementing social computing (SC) tools in higher education (HE) to enhance both the teaching and learning processes, with a particular focus on HE institutions in the Gulf States. Among other things, it reviews and addresses the known problems of HE in the Gulf States, discusses available SC platforms, and identifies the most appropriate of these based on the extant literature about user acceptance of technology.

SC platforms are quickly emerging as important new technologies that can support a variety of businesses. Many publications on SC discuss its definition and its associated tools, but while studies of this kind are an important part of the development of any new trend or technology, additional research is also necessary to determine the proper use of these phenomena in particular contexts, and as yet, no clear study exists that discusses the proper use of SC tools in HE.

The research in this study contributes to the fields of technology acceptance and SC research. It also demonstrates that the unified model of technology acceptance (UTAUT) can serve as theoretical basis for implementing SC in HE.

It employs a multi-methodological approach at all of its stages, including data collection and analysis. Questionnaires, interviews, observations, focus groups, and evaluations were all conducted in order to obtain the data on which the study was based. The final analysis of this data was used to develop a new conceptual framework for implementing SC in HE. The research findings are validated through the development and implementation of a new system prototype for using SC in HE.

This study recommends that stakeholders of HE in the Gulf States deploy SC technologies in HE to enhance generated outcomes by modernizing, supporting, and simplifying the teaching process while keeping students more engaged with customisable content. Online collaboration is also highlighted for its potential to enhance student learning and to transform education into a more user-centred process. In its summation, this study also includes a model for ensuring that research objectives are achieved and that defined knowledge gaps are covered.

Chapter1
Introduction

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1.1 Introduction

Many academic institutes these days are making experimental efforts to adapt to Social Computing (SC) in order to harness the new dimensions of benefits it can provide for students and instructors. These benefits largely consist of ways to facilitate communication and collaboration both between students and instructors on one side, and between individual students and their peers on the other. In this context, the term ‘communication’ means the exchange of thoughts, messages, or information between participants. Enhancing communication has innumerable benefits, including the expansion of knowledge, the generation of competitive advantage, and the creation of a network of participants that is based on loyalty and trust.

In this digital age, the internet has radically changed the way that we communicate, and technologies like e-mail and Instant Messaging (IM) are now used to set benchmarks for efficiency and effectiveness. These technologies have become the fundamental means of communication for most SC platforms. SC, therefore, has the potential to support Higher Education (HE) by facilitating communication among its stakeholders and by simplifying and expanding the ways that they can communicate, exchange knowledge, and interact with other communities.

Some organisations are already deploying SC tools but are not receiving the expected value from it (Cachia, 2008). This can be attributed to factors such as loss of control over the usage of these tools and gross misunderstandings of the real impact that SC can have on business.

This study contributes to the field of technology acceptance and SC research. It demonstrates that SC can play an important role in enhancing HE outcomes. It also demonstrates that the Unified Theory of Acceptance and Use of Technology (UTAUT) can serve as theoretical basis for implementing SC in HE successfully.

1.2 Higher Education (HE) in the Gulf States

Until recently, there were no systems of HE in the Gulf States. Just a few decades ago the only HE institutions that existed in even the most advanced nations in the region were teacher-training institutes or small private colleges (Shaw, 1997). Thus, the unifying

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characteristic of all systems of HE in the Gulf States is that they are all built around quite newly established institutions.

Since 2001, several universities from countries outside the region have opened branches or satellite schools in Gulf cities like Dubai in the United Arab Emirates and Doha in Qatar. These universities have given many Gulf locals the chance to obtain advanced degrees, and they have been instrumental in expanding opportunities for female students, who are frequently prohibited by conservative norms from studying at local institutions. Some of these foreign institutions have circumvented gender restrictions by providing separate classrooms for male and female students, while others have even gone so far as to provide geographically distinct, gender-segregated campuses.

As they rapidly grow, the Gulf States are increasingly focused on establishing higher institutions to provide their people with the skills needed to support that growth. In these institutions, however, local research is still in need of further development (Shaw, 1997).

1.3 Social Computing

In the last two years, the phrase ‘Web 2.0’ has become as popular as the word ‘internet’ itself. It was coined as a shorthand way of expressing the way that the sharing of information on common platforms like blogs, wikis, social bookmarking sites, microblogs, and social networking sites has changed the experience of the internet. All of these technologies are a part of SC. SC is the process of user collaboration and the development of online communities (Sarner, 2008), and the tools of SC are the range of applications that assist users in these acts of communication, collaboration, and content-sharing (Owen, 2006). In the business world, SC has restructured the consumer-producer dynamic by putting the consumer or end-user at the centre of communication, while producers simply respond to the demands and preferences of the consumer by providing products and services as they are needed (Gartner, 2008). SC can also lead to benefits like innovation from group-thinking and efficiency of appropriate knowledge acquisition (Punie, 2008).

1.4 Theories and Models of Technology Acceptance

Research on **technology acceptance** has been in a state of continuous development over the past few years. Three major disciplines have contributed to the development of models and theories that address technology acceptance, adoption, and usage. Psychology and sociology have both focused on behaviours of technology acceptance, while information systems has focused on the characteristics of specific systems in relation to it.

A significant body of the extant research on this topic has its foundations in the Technology Acceptance Model (TAM) that was originally conceived by Fred Davis in 1986. TAM is an intention-based model that was derived from the Theory of Reasoned Action (TRA) but tailored to meet the broad needs of information technology research (Davis et al, 1989). Since its introduction, TAM has enjoyed wide acceptance and has proven to be a reasonably accurate predictor of both users' intentions with respect to information technology and their actual system usage. TAM has evolved over years, and many researchers have tested the addition of new variables to the model in an attempt to increase its explanatory power. Venkatesh, Davis, and other researchers (2003) integrated TAM with seven other dominant models in the field of technology acceptance to create the Unified Theory of Acceptance and Use of Technology (UTAUT). According to its authors, this aggregated model is in an attempt to find a unified model that combines different perspectives in the field of technology acceptance research. They state that an end to usage intentionality determinants research might have been reached with the models' three intentional beliefs: performance expectancy, effort expectancy, and social influence. Nevertheless, the ability to examine external variables' impact on technology usage behaviour can also be examined through a fourth determinant: facilitating conditions.

In this study, the UTAUT model will be introduced in detail with its validation. It will provide a foundation for considering the level of user acceptance for SC in HE institutions in the Gulf States. The UTAUT model was originally built on a set of use-factors that the model calls 'constructs'. These constructs will be re-tested with users of HE in the Gulf States in order to ensure their validity in this context and confirm their relationship with the highlighted use-factors in this study. This study also includes

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development of a new model of user acceptance that is built on the UTAUT constructs and findings. This new framework can be considered as an extension of the UTAUT model based on its testing in the case-study institutions.

1.5 Rationale for the Research

The concept of SC will remain an important topic for a very long time, and organisations will continue to need to take risks in identifying the best methods for implementing its technologies in order to remain competitive (Pascu, 2008). Parameswaran and Whinston (2007) suggest that there is a very urgent need for research in the field of SC. They argue that research on SC and its impact on organisations and businesses is in its infancy and that it requires expansion in scope. More theories can and should be applied to explain SC's impact. This is a requirement if we are to understand the diverse nature of connections that are created by a social environment. Rigid frameworks may need to be deemphasised in Information Systems, as the technologies of Web 2.0 require a more fluid and flexible framework to be successful.

Many publications on SC discuss its definition and its associated tools, but while studies of this kind are an important part of the development of any new trend or technology, additional research is also necessary to determine the proper use of these phenomena in particular contexts, and as yet, no clear study exists that discusses the proper use of SC tools in HE. As it is one of the most critical industries of any country, HE should be enhanced with any tools that will help to maximise its generated value. In the Gulf States in particular, there are many challenges that confront teachers and students at the university level and act as a barrier to the achievement of higher learning and teaching goals. A survey of each of these challenges and the respective SC tools that could provide their solutions appears below:

1. Hall & Hall (2001) refer to the Gulf States as high context culture societies. The educational systems reflect one of the complexities of these cultures by segregating male students from female ones. Male fanatical sometimes urge female students to cover their bodies more thoroughly, and sharp quarrels can ensue. This segregation reduces and even sometimes wholly eliminates

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- communication between male and female students, which consequently reduces the opportunity for knowledge-sharing and scholarly discussion between the genders. SC platforms could serve as shared areas to facilitate collaboration and discussion between these otherwise disconnected populations. Even for women who dislike being known to men—in accordance with culture norms in the Gulf region that discourage such interactions—the anonymity that SC tools can provide could create a collaboration platform that circumvents gendered issues.
2. For the last two decades, research in the HE institutions of the Gulf States has focused on the growth rather than on the development of these societies (Shaw, 1997). Consequently, there is a great need for these institutions to shift their emphasis away from economic and technical growth and towards social and cultural development. SC platforms provide an excellent environment for socialization, and they could play a major role in promoting modern subjects and majors that focus on socialization and culture.
 3. Today's students are from Generation Y, or the NetGen, and they prefer to work in teams that involve peer-to-peer communication. They also like to be engaged in their learning, and they are more visually and kinaesthetically inclined (Conrad, 2004). Many of the HE institutions in the Gulf States still use old teaching styles that bore modern students and consequently make them less engaged. Linda Herrera (2006) denounces the inadequacy of the current state of HE in the Arab world, saying that it does not fulfil its students' social needs. Teaching in Gulf HE institutions could be improved from this state by exploring new learning techniques, fashions, and research. SC platforms offer modern learning environments. They make it easy for students to join virtual classes; contribute to blogs, wikis, and social websites; and explore a lot of student-created learning materials. This level of involvement makes for a more engaged student body.
 4. Poor research and redundancy in the most attractive disciplines are the two principle structural problems of HE in the Gulf States (Romani, 2009). Research in the Gulf States almost always focuses on oil and strategic matters, while there remains a serious need for contributions in the area of social development. Online collaboration with SC tools in academia could help students to share knowledge

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and explore new ideas, activities which could in turn increase innovation and research in these underexplored areas.

5. In most of the Gulf universities, English is the instructional language for the technical disciplines (Shaw, 1997). Shaw observed that, though English is widely spoken in all the Gulf States, however, formal writing in these areas of specialization needs strengthening. SC tools like wikis and blogs are, at their core, simply writing platforms, and they have great potential to increase foreign language skills. Blogs in particular have often been celebrated for their success at both enhancing language skills and promoting creativity (Ducate, 2008).

1.6 Justification of the research problem towards setting the aim

Because SC is a relatively new and popular topic, many papers on the subject have focused their efforts on delineating its terminology and exploring its business applications. Parameswaran and Whinston (2007) and Charron (2006) have explored most of the known SC platforms and explained how these technologies threaten existing business models. They have also supplied recommendations as to how companies can best adapt to these technologies to anticipate new opportunities. Other studies have highlighted the possible benefits of using SC in business. Microsoft Dynamics (2009) investigated the use of SC tools in business to enhance the CRM and marketing systems in organisations and allow businesses to engage their customers socially. Gleave, Welsler, and Lento (2009) have introduced conceptual and operational definitions of social roles in online communities and discussed the movement of social life to the data-sphere.

Eastwood (2009) recommended that organisations should ensure that at least 24% of their employees have accounts on social networking sites to collaborate amongst themselves. He claims that the question is no longer whether or not organisations should implement social software, as the affirmative answer to that question is already a given. The real question, he argues, is how much organisations will be able to benefit from this implementation (Eastwood, 2009).

Sarner et al (2008), and Huijboom, Broek, and Frissen (2009) in their Gartner research, explained the impact that SC has on business. The Gartner publications also

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outlined the specific impacts of SC on marketing and generation Y, the CIO, company governance, HR data, identity management, data exposure in the workplace, licensing and IP ownership, mobile communities, enterprise feedback management, government, television, and media companies (Gartner, 2008).

Another study by Parameswaran and Whinston (2007) highlighted research issues in SC. These issues included organisational form, governance structure, intellectual property rights, and the efficiency and stability of online networks. They argue that all of these issues have become incredibly important as the locus of control of content creation and configuration has shifted to the grassroots population (Parameswaran & Whinston, 2007).

Heid, Fischer, and Kugemann (2009) developed several good practices for implementing Learning 2.0 approaches in education by studying eight Learning 2.0 cases and explaining how this model generates new learning innovations with SC tools.

Redecker (2008) discusses some particular SC tools and their educational uses. He analyses social networking services, syndication and notification technologies, blogs, wikis, tagging, social bookmarking and folksonomies, media-sharing services, podcasts, and vodcasts. Redecker expresses interesting ideas about how these tools could be used in education as well as in the other industries, but he conducts no deep research on exactly how they can be implemented to enhance educational outcomes.

Ala-Mutka (2008) and Zengyan, Yinping, and Lim (2009) studied SC's mechanisms for the creation of new knowledge, content, and value through user participation. The works of Broek, Huijboom, and Frissen (2010) and Ala-Mutka (2008) summarise the economic and social impacts of using SC tools in business in any capacity.

Though these publications establish a lexicon of SC terminology, discuss its existing tools, introduce valuable thoughts on SC's potential to enhance lifelong learning, and highlight the social and economic impacts of SC's implementation in the business world, there is still a clear research gap regarding how these tools can be adopted to improve the educational outcomes of the HE institutions.

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1.7 Research Questions

This study targets and answers the following questions:

1. What are the main problems that HE faces in the Gulf States?
2. What are the main features of SC platforms that could be used to increase collaboration and content-sharing between students in an educational context?
3. How can the behaviour of individuals using SC technologies be analysed, and what are the factors that affect the acceptance of such technologies?
4. How effectively can SC tools be implemented in HE institutions in the Gulf States to enhance the teaching and learning processes?

1.8 Aim and Objectives

This study aims to develop a framework for the effective implementation of SC tools in HE institutions in the Gulf States in order to enhance teaching and learning processes.

Its main objectives are:

1. To diagnose the current state of HE in the Gulf States by exploring its problems. This will include a critical review of the known issues and barriers that negatively affect student learning. Understanding these issues will assist in the development of a proper conceptualization of how SC tools can be used to enrich teaching styles with modern and supportive models and to increase the rate of student learning.
2. To explore SC tools that facilitate collaboration and content-sharing, and to investigate the potential role of SC platforms in developing student learning.
3. To explore user acceptance of SC tools in educational contexts. This includes exploring the reasons why individuals use SC tools and determining both the types of information that they are sharing and which exact tools they are using. This will help in identifying both the potential impact of SC on HE in the Gulf States and the potential benefits of using SC tools for individual students and instructors.

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4. To specify a new conceptual framework for the effective implementation of SC in HE in the Gulf States.
5. To instantiate that conceptual framework by creating a prototypical online course system. This new system will involve the use of SC tools that support student learning and enhance the teaching process.
6. To refine and validate this framework by testing and piloting the new prototype with end-users who will be subsequently interviewed, and to recommend this validated framework of effective implementation of SC in HE.

1.9 Research Methodology

The research methodology is that part of science which studies how research can be done in scientific and systematic various steps. It defines the research activity including how data will be collected and analysed, how research will proceed and how to measure success (Pérez, 2010) . This study aims to define the moderator factors that affect user acceptance of using SC in learning activities in order to develop a new framework for implementing SC in HE. It targets to answer the previously mentioned questions in order to achieve the research aim and objectives. Set of quantitative and qualitative data collection tools are utilized with clear orientation toward a qualitative epistemological position which recognizes the importance of locating the research within a particular social, cultural, and historical context.

1.9.1 Research Philosophy

A research philosophy embodies the researcher's beliefs about the phenomenon under investigation (Galliers, 1991). To define the research philosophy, there are two prevalent philosophical branches, namely ontology and epistemology. Logically, epistemology comes after ontology.

The data-gathering approaches and the way the researcher applies existing knowledge on HE in the Gulf reflects reflect an objectivism ontological position, while

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the epistemological position for the researcher throughout the study is positivism, as the research depends mainly on the approved theories of technology acceptance plus the successful implementation and best practices for using SC in HE. The researcher applies existing knowledge about SC and its use in education to support HE institutions in the Gulf States by employing new teaching and learning methods that are expected to enhance these processes.

1.9.2 Research Approach

Two methodological research approaches were highlighted by Yin (1994), the inductive and the deductive approaches. The inductive approach is defined as an inquiry undertaken to understand a human issue or explore a social problem from various perspectives. It starts with an investigation of an untheorized area in order to develop a corresponding theory. However, the deductive approach starts with an already existing theory and extends to its empirical investigation (Yin, 1994).

The deductive researcher composes one or more hypotheses based on the existing knowledge body, and then conducts data collection and analysis to test the hypotheses; however, the inductive researcher collects and analyses data to come up with new theories and explanations using the existent knowledge body and from them develops new findings. Because of its reliance on the current body of knowledge in composing a hypothesis, deductive research aligns with the objectivist and positivist philosophical positions.

In this research, the existing knowledge about SC tools and their use in education plus the approved theories of technology acceptance will serve as a basis for composing a new set of hypotheses on the use-factors that affect user acceptance of SC tools in HE. Considering the nature of this research study, both inductive and deductive approaches are being used. A conceptual framework will be developed from the review of the existing literature about SC, the problems of HE in the Gulf States, and the technology acceptance theories. This development adopts the deductive approach as it goes from the existing technology acceptance theory, the Unified Theory of Acceptance and Use of Technology (UTAUT), to define the factors that affect the user acceptance of using SC in HE in the Gulf States. After that these factors help in theorizing the effective

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implementation of SC through offering a new conceptual framework for implementing SC in HE in the Gulf States. The research starts with set of hypotheses that being studied in two case study institutions in the Gulf States. Merriam (1988) argues that the nature of such case studies mostly utilizes an inductive approach due to new concepts, understandings, and relationships arising from studying the collected data.

So, this research study develops a new framework for implementing SC in HE in the Gulf States as a new theoretical reference for enhancing the teaching and learning practices in this region of the world. This concept is new and represents an addition to the knowledge body. It also comes through qualitative research approach in which the collected user knowledge about SC was interpreted. This means an inductive approach is being conducted. The research also analyses the use of UTAUT theory, and extends it through developing new constructs and relationships, which confirms that an inductive research approach is used.

To sum up the philosophies and research approaches used in this research, it can be said that this research adopts the objectivist and positivist philosophical stances and employs a combination of inductive and deductive research approaches.

1.9.3 Research Strategy

Among many research strategies, the qualitative and quantitative strategies are highlighted by Casebeer and Verhoef (1997) as the main research strategies available for primary data research. Quantitative research strategies, known by as “scientific methods,” study the relationships between facts through gathering factual data about them (Fellows and Liu, 1997). The analysis of the quantitative data generates quantitative results that are derived in light of the studied theory and literature.

A research strategy may include archival analysis, survey, experiment, and observation (Yin, 1994). In this research, case study, observation, interviews, and survey questionnaires are used as research strategies. As pointed out by Yin (1994), when focusing on contemporary phenomena, the case study method will emerge as the most suitable research strategy. Yin (1994) mentioned that the case study methodology has

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been recommended by many researchers as an ideal instrument for understanding many context phenomena. Furthermore, the most important aspect of any credible research strategy is that the investigator should adopt a stance of neutrality with regard to the phenomenon under study (Patton, 1990). United Arab Emirates University (UAEU) in the United Arab Emirates (UAE) and Aspire Academy for Sports Excellence in Qatar have been defined the case study institutions in this research study. Both of them are two governmental educational institutions that have the large share of their students coming from local students. The students are expected to reflect their own country culture in their behaviours. Also, in these institutions, male and female students are segregated among campuses spread over a wide geographic area. So, most of the issues in the academic institutions in the Gulf region will be easily highlighted and challenging in these two institutions. Thus, the rationale for selecting this case study was to study the current situation in these institutions within particular class groups or communities and to highlight the clear issues of the student learning.

1.9.4 Research Data

Two types of research data could be collected and analysed: quantitative and qualitative data types. Quantitative data requires quantitative research methods, while qualitative data requires qualitative methods. Fellows and Liu (1997) mentioned that the analysis of quantitative data yields quantified results that are extracted from the evaluation of the data according to the available literature and theories. On the other hand, qualitative methods concern the qualities of the phenomena under research rather than measuring it numerically. The analysis of qualitative data yields rich and complex results. The qualitative researcher focuses on understanding and analysing researched real-world phenomena within the context of a reality. Their beliefs emerge from their interpretivist style. This research employs both quantitative and qualitative data and methods. The collected data will be generated from student surveys and questionnaires, interviews, observations, and focus groups. These data will be analysed based on the approved theories and best practices for using SC in education.

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a) *Data collection methods*

In the research studies that adopt the case study strategy, there are many collections methods that could be used. These methods include questionnaires, observation, interviews, focus groups, and gathering of documentation and artefacts (Gillham, 2000).

Determining the appropriate data collection method for a study requires deep understanding of the task requirements to ensure that the appropriate measures are considered. The following points should be considered before selecting a certain research method/tool:

- When analysing gathered data using the method, any special requirements or difficulties in conducting the data analysis must be noted.
- In prototyping and user design evaluations, some human-factor issues might be raised and should be taken into account.
- Deep understanding of the task requirements results from selecting the appropriate measure.
- The cost of each method (in terms of time, effort, mental load, etc.) should be considered carefully. Each method has its cost, and usually researchers use more than one method together. For example, questionnaires might be used with observation. Observation itself might be used in combination with interviews to analyse user understanding and workload. So, considering the research goals and constraints helps the researcher to ensure the selection of the appropriate research methods and tools.
- Any advantages or disadvantages of the research method should also be considered.

In this research study, the used methods and tools for data collection included questionnaires, observation, interviews with students and instructors, focus groups comprising instructors and/or students, workshop, experimental design/prototyping, and expert evaluation. The data collection stage starts with a survey questionnaire to collect some data about the user experience of using SC websites a in their life at all. That

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survey is administered to a broad spectrum of user to help in defining the user background and subsequently spread the second survey questionnaire to a purposeful sample which is being identified to participate in the second round of data collection. This sub-sample includes those who are familiar with SC websites and technologies. The second survey questionnaire targeted collecting data about the factors that can affect the user acceptance when using SC in education.

To support the collected data from the first questionnaire with more accurate findings, observation sessions were conducted to observe students when use SC in their learning or free times.

A structured interview protocol is developed to aid in field note collection during the semi-structured interviews. Multiple interviews are planned with targeted group of instructors and students in order to provide more in-depth data collection and understanding of the effective use-factors that can affect the user acceptance of using SC in HE. The goal is to interview approximately 10 users who come from different colleges and majors in the case study institutions. This number might be modified according to the saturation of data.

Focus groups are also utilized in this research to exercise collaboration in real case and give accurate feedback and opinions about the factors that might affect socialization and using SC in an educational context. Four focus groups are conducted in the case study organizations with groups of instructors from both institutions.

Two workshops were conducted with students and instructors from the case study institutions to do hands-on training on using SC in educational setting. Instructors were asked to upload some SC content items (including wikis and blogs) that discuss some learning topics, and then the students were asked to contribute in that learning activity by adding threads and discussing these points all together. These workshops were planned to half-times, one for using the SC items and the second to evaluate each factor of the proposed use-factors that affect the user acceptance when using SC tools.

The research findings ended by developing conceptual framework for the implementing SC in HE. The framework was instantiated by developing system

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prototype for an e-learning system which harnesses SC tools in HE. The prototype was evaluated by usability experts in heuristic evaluation step before conducting pedagogic audit with three instructors from the interviewed sample.

b) Methods for Data Analysis

The following steps were introduced by Leedy and Ormrod (2001) as guidance for researchers to analyse the collected data in the case study research:

- i. Categorization of data: data should be categorized and classified into meaningful groups.
- ii. Interpretation of single instances: specific documents, responses, and other data elements should be considered and examined for specific meaning in relation to the case study.
- iii. Identification of patterns: the data and their interpretations are scrutinized for underlying themes and other patterns.
- iv. Synthesis and generalizations: an overall portrait of the cases. Conclusions are drawn that may have implications beyond the specific case study that has been studied.

Beside these steps, which were considered and adopted in the analysis of the data in this research to analyse the qualitative portion of data collected from the interviews, focus groups, and observation, the data analysis stage included usage of the statistical package software SPSS version 20.0 to analyse the quantitative portion of the data collected from the two surveys. The analysis of the quantitative data included:

- a) Organizing, classifying, and interpreting the collected data
- b) Representing the collected data in a graphic way for clear understanding of the data classification
- c) Performing confirmatory factor analysis to ensure reliability of the collected responses

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1.9.5 Research Processes

Table 5.8 in chapter 5 of this thesis summarizes the stages of the research process and highlights the research methods used in each stage.

1.10 Scope of Research

This study will focus on HE institutes in the Gulf States, where SC may help to resolve many cultural issues. It will include an examination of the potential value of SC as a tool to enhance relationships between academic institutions and their stakeholders in order to generate greater value for all involved parties.

It will include the proposal of a model for e-Learning courses to help organisations recognise the potential benefits of SC tools. This model will mirror many aspects of traditional course structures in order to render its acceptance more probable. The prototype will be tested with users from the Gulf States. These users will all be from similar cultures, and they will share similar desires to collaborate with others.

1.11 Synopsis of Research Impact

This study hopes to close the research gap with regards to the use of SC in HE to enhance teaching and learning practices in the Gulf States. It will help HE stakeholders in the Gulf region to make effective improvements to the outcomes of HE institutions. It will also align HE in the Gulf States with the applied educational styles of other countries that have advanced HE systems.

This study will include the development of a conceptual framework guiding for SC implementation in HE in the Gulf States and its prototypical system to harness SC tools that will be based on the proposed framework to enhance Virtual Learning Environments (VLEs) and e-Learning systems. If this prototype is implemented, this study will positively affect the generated value of HE in the Gulf States, at least on the level of enhancing the educational outcomes. It will lead to the development of a new system that encourages students to learn and to meet institutional objectives.

1.12 Research Structure / Guide to Thesis

Figure 1-1 illustrates the whole structure of this research study. The following sections provide brief descriptions of each chapter of this thesis.

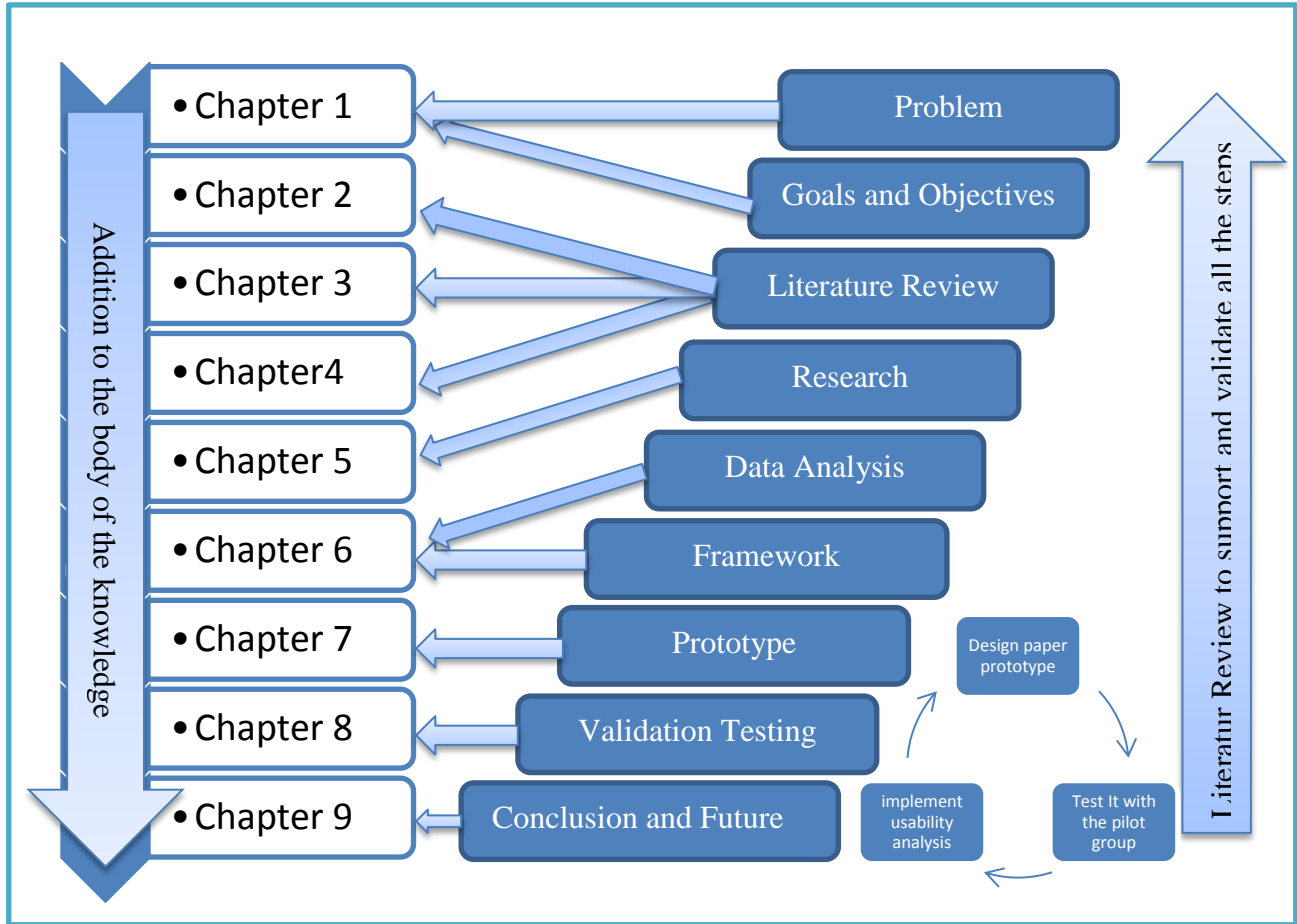


Fig. 1.1: Research Plan

1.12.1 Chapter 1: Introduction.

This chapter begins with a brief description of the focus areas of this study: the current status of HE in the Gulf States, the implementation of SC into businesses and other organisations, and theories of technology acceptance. This introduction helps to explain the rationale behind the study. It also defines the problems, aims, objectives, expected impacts, scope, and limitations of the research. This chapter includes summary of the adopted research methodology with highlight on the implemented research methods and approach. And it ends with a summary of the contents of the other chapters.

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1.12.2 Chapter 2: HE in the Gulf States

Chapter two explores the extant literature about the HE problems in the Gulf States. It starts with a historical background about HE in the Gulf States and then summarises fifteen of the greatest HE problems that the Gulf States face today.

1.12.3 Chapter 3: SC in HE

Chapter three begins with a review of the extant literature on SC, its tools and technologies. It focuses on the tools that have the most potential utility in education, providing a brief description of each of these tools and the mechanisms by which they could support the learning process. Next, it summarises some known strategies for the use of SC for pedagogical innovation in education. After this, it introduces some SC practices for innovation in the educational organisation. The chapter closes with a discussion of the culture of the Gulf States and how it affects socialization activities.

1.12.4 Chapter 4: Technology acceptance theories

This chapter introduces nine of the established models of technology acceptance. It discusses ensuring the acceptance of SC tools by users in the field of HE. The end of this chapter summarises the differences between these models in order to clarify the investigative thrust towards the acceptance of technology.

1.12.5 Chapter 5: Research methodology

Chapter five introduces the research methodology in detail. It presents the study's philosophy, approach, strategy, and design, as well as the tools and methods used to address its aims and objectives. It includes a definition of the data collection and analysis methods that are used by this study. It ends by explaining the reliability and validity testing of the research and summarising the considered ethical issues.

1.12.6 Chapter 6: Data analysis

This chapter presents the collected data and uses it to analyse the characteristics of SC users in the Gulf States. The most important factors that play a role in determining

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user acceptance of SC in HE are highlighted. The chapter then presents a deep analysis of each surveyed factor and ends by developing a new framework or theoretical foundation for implementing SC in HE in the Gulf States.

1.12.7 Chapter 7: Online course prototype

In this Chapter, a prototype of a new online course system is developed in order to pragmatically validate the conceptual framework produced in chapter six. This prototype is based on the use of SC tools to enrich the virtual learning environment with collaboration and socialization activities. The data previously collected from students and instructors is used in the development of this prototype.

1.12.8 Chapter 8: Testing and validation

This chapter focuses on validating the research findings. It tests the previously generated framework by validating the prototype. The validation process involves testing the success of the proposed online course system (OCS) in terms of user acceptance, user satisfaction, and expert evaluation.

1.12.9 Chapter 9: Conclusion, recommendations and future work

The final chapter presents the conclusions derived from the study and makes recommendations for future research. It discusses the research findings and links them to the original research questions to ensure that the knowledge gaps highlighted earlier in the study have been filled.

1.13 Summary of the Chapter

This chapter introduced the core concepts of the research study and explained its motivations. This study hopes to bridge the knowledge gap in the area of solving HE problems in the Gulf States with SC by applying the Unified Theory of Acceptance and Use of Technology (UTAUT) to HE. It aims to develop and propose a framework for the effective implementation of SC tools in HE institutions in the Gulf States to enhance

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teaching and learning processes. The problem, objectives, expected impacts, scope, and limitations of the research have all been stated. This chapter concluded with a summary of the content of the following chapters.

Chapter2
Higher Education in the Gulf
States

2.1 Introduction

In this chapter, the literature on higher education (HE) in the Gulf States will be explored with a focus on highlighting the most known and clear issues. This review covers the problems of HE in the Gulf since its inception, to the present day. There are some issues that were treated in the recent years by using certain tools or technologies; these issues will not be summarized here. The main focus here is on problems that are still binding and in need of effective solutions. This review helps define some possible gaps in the research on HE in the Gulf region. The next step in this research extends to exploring SC tools and characteristics to see if SC can work as solution for the problems defined in this chapter. Considerations like the cultural norms in the Gulf States will be included herein, to help decide whether SC (or any other tool or method) can provide real solutions for these problems.

2.2 Historical Perspective

The history of HE in Gulf began in the other Arab countries during the time of the Islamic renaissance, in the eighth and ninth centuries (Aswad, 2003). These centuries witnessed the rise of the Abbasi caliphs during the period from 750 to 850, when the caliphs established libraries, translation institutes, hospitals, and observatories (Guruz, 2008). Baghdad, the capital of Iraq, was one of the most important cosmopolitan and intellectual centres at that time, on a scale with Athens and Alexandria. It attracted students and scholars from everywhere in the Gulf States and even from central Asia (Cowley, 1991).

For centuries, the education in all the Gulf states took a single form, called *Kuttab*, in which boys met with their teacher (called the *Mutawa'a*) to study basic reading, writing, and arithmetic skills in parallel with large sections of the Quran and Hdaith, the utterances of the prophet Mohamed (Davidson, 2008). These students would study these skills and sciences for some years until they were satisfied or joined work positions; some of them might continue with more sophisticated Islamic studies

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and go on to become scholars, known as *Ulama*, and ultimately to teach the younger students (Bahgat, 1999).

This form of education survived until 1893, when the Turks gradually introduced their education system in all of the Arab countries by establishing some elementary and secondary schools called *Madrassahs* and *Rushdiahs* (Roucek, 2009). By 1860, these schools were wide-spread everywhere in the Gulf States. Between 1870 and 1920, seventy-eight Turkish schools for the different levels of education were established in Saudi Arabia (El-Sanabary, 2004).

2.3 Establishment of the Gulf Universities

The re-emergence of the Gulf States started in the early decades of the twentieth century. This era witnessed the establishment of some universities, following into some Arab countries like Egypt, where Cairo University was founded in 1908, and Syria, which established its first university, Damascus University, in 1923 (Landau, 1997). The universities in the Gulf States started as public interest of the governments, which perceived them as playing a vital role in national development during those times (Kettani, 1974). Starting with Saudi Arabia, which established the King Saud University in 1957, the Gulf States worked on expanding HE with the introduction of large universities like Kuwait University in Kuwait (1966), Qatar University in Qatar (1977), United Arab Emirates University (1977) in the United Arab Emirates, Sultan Qaboos University in Oman (1986), and the University of Bahrain in Bahrain (1986) (El-Sanabary, 2004).

The governments in the Gulf States saw these universities as the best places to massively develop the expertise required in all fields to allow the society to replace colonial manpower, even if this was at the expense of the educational quality itself (Landau, 1997).

All of the Gulf States provided education for free or at minimal cost, and the governments played dominant role in controlling the curricula at the different education levels. Each state had two governmental authorities for controlling the education and defining policies and laws for it: one for K–12 education, usually called the ministry of

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education, and the second for post-secondary education, typically called the ministry of HE in all the Gulf States (Rugh, 2009).

Bahrain had the oldest public school system in the Gulf States. It opened the first public primary school for boys in 1919 and another one for girls in 1930. These two were the first public schools in the Arabian Peninsula. Saudi Arabia did the same by 1930 and 1960 (for boys and girls, respectively); however, Qatar opened both school types (for boys and girls) in 1952. With respect to HE, Iraq started the first college in the region in 1908, and then expanded its institutions after independence in 1932, ultimately building 315 schools and several colleges. By 1988, the total enrolment in HE institutions in Iraq reached 209,818 spread out across many colleges and two-year technical institutes. Oman was the last country in the region to provide public and HE for its citizens; its first school opened in 1970 (Altbach, 2009).

Today, many foreign and well-known universities have opened branches in the Gulf area in the form of private institutes owned by investors or operated as foundations. These private institutes make up 30% of the HE enrolments in the states that host them (Guruz, 2008). Some of these institutions are for-profit and others are non-profit. They may be eligible to function under the governmental system or operate completely outside of the local regulations (Altbach, 2009).

Most of the Gulf nations depend on the state to provide and finance education at all. Recently, Oman announced that private providers, including foreign ones, would be eligible to enter the education market (Ibid, 2010). All of the Gulf nations saw the expansion and authorization of the private HE sector as a key solution to the educational problems in their countries (Iqbal, 2003). So, they provided strong public support for the first private institution that opened in each state. Qatar, the United Arab Emirates (UAE), Saudi Arabia, Oman, and Bahrain have witnessed revolutions in the sector of private HE during the last 4 years, something that continues to be praised by their governments. This is especially true of Qatar and the United Arab Emirates, which have hosted many foreign universities, in the Knowledge Village (in UAE) and in the Qatar Foundation (in Qatar). Some of these universities are locally funded institutions while others are joint ventures with some known foreign institutions. The main theme of these foundations in Qatar and UAE is expressed in the concept of

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High-Prestige Education Cities, meant to attract the big universities worldwide and to announce the countries as home to world-class HE. This also helps them to achieve the bigger goal of becoming regional hubs of education (Iqbal, 2003).

Finally, in terms of statistics that reflect the rapid expansion of establishing HE institutions in the Gulf, Saudi Arabia had 8 universities in 2003; by 2010, the country had added 100 new colleges and universities. Also, the defined budget for HE in Saudi Arabia exceeded \$15 billion in 2010, significant for a country that has only 23 million of inhabitants (Romani, 2009).

2.4 Problems facing HE in the Gulf States

There is no doubt that more research and re-examination are desirable for the improvement of HE and scientific research in the Gulf States, in terms of HE quality and work meeting the real needs of the society. As a cornerstone of such improvement, there is a need to focus on real problems that help diagnose the state of HE in the Gulf States.

The following problems are highlighted as challenges for HE in the Gulf States.

2.4.1 Soaring Demand

The youth population doubled between 1980 and 1990 (Shaw, 1997). This rapid growth consequently led to greater numbers of HE students. Al Rashdan (2008) mentioned that “the number of students in HE was doubled twice during the last two decades of the twentieth century”. This explosion of students created a critical situation for most of the universities in the Gulf, as they were not able to absorb all of the students produced by this rapid growth. Along with this growth, the social value was affected as well.

The Arab governments established a great number of universities in a short time. In 1950 there were fewer than 10 universities in the Gulf area; however, by 2003, there were more than 200 universities (UNESCO, 2003). Heyneman (1987a) argued that during the first decade of the twenty-first century, the rate of enrolment in HE

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increased remarkably. The same period saw an increase in demand for HE, which resulted in commitments from the governments of the Gulf States to make HE available and as accessible as possible.

In the HE Conference of the Arab Region, which took place in Beirut in 2006, the recommendations declared that due to the rapid growth of the population and the social demand for HE, a huge strain had been placed on the HE institutions of the Gulf States. This led to noticeable increases in the student enrolment rates in a short period of time, for which these institutions were not prepared with sufficient financial resources (UNESCO, 2007).

Moreover, because of the high enrolment rates in HE institutions in the Arab region, these institutions were challenged to satisfy the need of their societies by providing flexible enrolment and lifelong learning availability. As such, there was an urgent need to reform the HE institutions' structures to harness modern information and communication technology. Such a step would mean that educational institutions would have to "contribute in the provision of courses and degree-awarding programs through multiple and advanced means, thus breaking through the traditional barriers of space and time" (UNESCO, 1998)

The growth in demand rates for HE should be carefully considered and treated because it can affect the quality of education if the response to that growth is to simply accept higher enrolment rates regardless of the possible negative effects on the quality of education offered by HE institutions. Applying quality assurance policies and raising the level of the educational resources are important consideration, including developing the teaching staff, teaching materials, teaching pedagogy, staff professional development, class room environments, and providing related resources like teaching labs, teaching and learning technologies, and libraries. All of these can help expand HE safely, without risking its quality. The following pages introduce the issues that seem related to these resources.

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2.4.2 Origins of educational structures: Old regulations and traditions are controlling the HE Systems.

During the 1950s and 1960s, it was believed that planning and managing the economic growth of industry, agriculture, and services, including education, had to be done through central authorities. The original regulations for the HE systems in the Gulf States hark back to that era of central planning and are still applied today in almost all Middle East countries (Heyneman, 2007). These regulations included the managerial principles and management structure of the educational systems. The main purpose of the education institutions at that time was to produce employees for public enterprises, which were owned by the governments and given the power to lead the growth in each state.

Al-hawari (2010) mentioned that the number of university graduates from all colleges was already pre-defined, given that the growth was already planned. This meant that individuals had fewer opportunities to estimate the market demand themselves and consequently enjoy more flexibility to study certain major(s). For example, some technical faculties, like medicine, engineering, and law, were limited in accepting students as per their demand, but instead had to proceed according to some administrative decree governing manpower planning as per the society's needs for technical, manual, or professional manpower. Such decrees caused HE to grow more in the social sciences. Even the expansion of any degree program was determined according to old public economic needs.

These governmental decrees were issued according to outdated economic conditions which no longer apply (Heyneman, 2007). The society itself has changed, while the HE manpower policies still refer to the previous era. Nowadays, the Gulf States have seen noticeable growth of private sector organisations. More private and multinational companies are located there now and need more manpower in terms of qualified human resources. Even with regard to HE itself, private institutions have existed and are still expanding, especially within the free zones or foundations like Knowledge Village in Dubai and Qatar Foundation in Qatar.

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Some in-parallel policies have to be developed for HE to serve the modern societal needs and satisfy the society's expansion with qualified graduates (Heyneman, 2007). This notion may urge existing HE authorities to change the basis for competition in the HE market by providing opportunities for all of the available institutions to produce more university graduates based on assuring the quality and re-assessing the real market demand.

2.4.3 Rapid Expansion of Education in One Generation

After the oil boom, which began in the Gulf States a few decades ago, the schooling system expanded rapidly without any interim period of meeting the requirements for such expansion and adjusting the educational organisations and systems to absorb this expansion in ways that would reflect successful outcomes. Unfortunately, an effect of that expansion was that HE, as an extension of the schooling system, did not satisfy the needs of the labour market (Mahdi, 1997).

Unfortunately, the existing schooling system at that time had to receive all of the students somehow and provide them with instruction at the primary and secondary levels of education. Because of the unplanned growth and limitations in resources, the schools generated weak learning outcomes and passed poorly educated students to the universities by way of completing the education cycle and providing opportunities for all of students. This set a "trap" for the universities and affected student learning negatively, ultimately lowering the level of HE overall.

Moreover, there was no clear policy effort to develop the existing curricula or to establish alternatives to the existing universities by providing, for example, short-cycle institutions which would accommodate the rapid growth in demand for HE. A similar situation took place since the second world war in the USA, the UK, Canada, and Australia; it was resolved by developing widespread policies to establish such short-cycle institutions (Neave, 2008). These institutions provided vocational education and skills-based training, with some support from governmental policies. The introduction of similar institutions in the Gulf could serve the HE authorities to empower university-

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level education on the one hand, and to encourage diversification of specializations to satisfy labour market needs on the other hand.

Some measures can be developed based on student performance to coordinate student enrolments between the universities and technical institutes. This can help meet some of the enrolment needs in these institutes and consequently consolidate the HE institutions by filling them with nominated high-performance students, leading to lower enrolment numbers. In this way, they can ensure higher levels of education quality and proper expansion of the post-secondary education system (Neave, 2008).

Another alternative can be developed using modern educational technologies. For example, virtual campuses and distance-learning universities could help deliver HE to remote students. Now, it is clear that some open universities (part-time universities) and virtual schools in the UK and the USA have served many students to conduct their undergraduate and even also post-graduate studies while working and attending other activities. Implementing these new learning models in the Gulf States could help expand HE with quality savings and facilitating means.

2.4.4 Low Professionalization of Instructors

In any academic institution, the teaching profession should demonstrate a differentiation strategy based on the performance, effort, competence, and creativity of the instructors. In the Gulf, teaching staff are selected on the basis of their education attainments and, in some cases, the length of their previous teaching work experience, regardless of their performance in that capacity (Heyneman, 2007). Further, sometimes there is ignorance of the instructors' backgrounds.

In almost every university in the Gulf States, it will be seen that there are some instructors who come from outside academia. They worked in professional tracks and upgraded their studies to the master's or PhD level; then, the Gulf universities accepted them, regardless of their performance in academia. Some local professors can be found in Gulf States universities who were nominated to work at these universities based on very weak criteria, such as depending on their citizenship. This affects the level of instruction and university outcomes in general.

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Another issue that affects the teaching staff directly is their salary scales. They are subject to low compensation overall. Moreover, they are not differentiated from the management staff, such that there is no clear policy to prevent overload on teaching and research work, aside from the normal workload and duties. This low compensation discourages the staff from putting more effort into research and creative activity, especially when the feeling is that performance and dedication will remain unrewarded. Even staff with more marketable skills will turn over or leave (Heyneman, 2007).

2.4.5 University Educational Curricula Are Mostly Theoretical

Al-Rashdan (2008) mentioned that the educational curricula in Gulf universities are mostly theoretical and philosophical. This affects student learning negatively, given the following reasons:

1. It creates a tendency to lack harmony between curriculum content and objectives, as well as between the students' learned skills and the needs and problems of the society. Many universities in the Gulf are providing theoretical curricula and have a majority of their students enrolled in the humanities and social studies; however, many Gulf cities like Dubai and Doha are under developing revolution in construction, which leads to increased need for practical majors of study.
2. It focuses on memorization, and sometimes ignores critical thinking and situation/problem analysis. Many students spend a few days before exams and even exam days memorizing parts of the curricula that seem important to them; then they go to exams and just recall this information, later forgetting everything about it. Even worse, they inherit each other and develop an organisation culture geared toward finding easy ways to pass the exams without fail. Especially in theoretical subjects like the humanities and social sciences, it is common for the students to start the memorization process a short time before exams to count on fresh memories during the exams and pass with the lowest possible level of effort.

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The practical sciences help students to gain practical experience along with understanding of the content. However, with the focus only on abstract or theoretical studies, the students miss out on such practical experiences; even the country loses the required local expertise in many fields (Al-Rashdan, 2008).

No lifelong learning can be gained if students focus on memorization until they pass their academic year, and later they almost forget all about these theoretical subjects. Under these terms, learning skills disappear and many students fail to learn new concepts by themselves. They always need some training to deal with new staff. A visit to any of the Gulf universities would reveal the low levels of learning there.

2.4.6 The Need for Quality Assurance Framework

The Gulf States have many features in common, in particular from the cultural and historical standpoints; however, there is no real cooperation or academic relations between their universities (Neave, 2008). Moreover, most of the Gulf States are not internationally accredited. These two issues—the lack of either cooperation or international accreditation—mean that there is no clear outcome assessment in many of the Gulf institutions. As result, a graduate from a college of engineering in a university in Saudi Arabia may have a different knowledge base and skills than a similar graduate in Oman. Al-Rashdan (2009) argued that there is a clear need for a quality assurance framework to ensure highly qualified graduates and align university outcomes with the accredited international standards of HE.

A clear challenge is to implement one quality assurance framework in all of the Gulf States, given the differences between the different states in terms of per capita income, prosperity, national income, and population size (Neave, 2008). In some countries, like the United Arab Emirates and Qatar, where the national income is high, universities can implement more advanced technology systems and develop proper learning facilities such as modern labs, work fields, and training camps. Such facilities help the university to achieve higher levels of learning, even as the students benefit from these facilities by learning in practical way and gaining experience from their hands-on work and collaboration within subject-related environments.

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As such, more funding is required for HE in all of the Gulf States, to align the educational environments with the standards applied in the USA, Canada, Australia, and Europe. This could help improve education overall and consequently achieve more steps toward implementing standard quality assurance frameworks and accreditation programs.

2.4.7 Make the Quality Assurance Mechanisms Coherent

There are some trials for applying quality assurance mechanisms in the United Arab Emirates and Qatar. As in any country that wants to ensure quality of education and consequently confirm that it has an effective educational system, the quality assurance framework should include four basic mechanisms. These mechanisms are curricular objectives, classroom teaching, teaching materials, and examinations and other assessments (Heyneman, 1987a). These mechanisms have to be internally coherent and updated according to changes in any one of them (Figure 2-1).

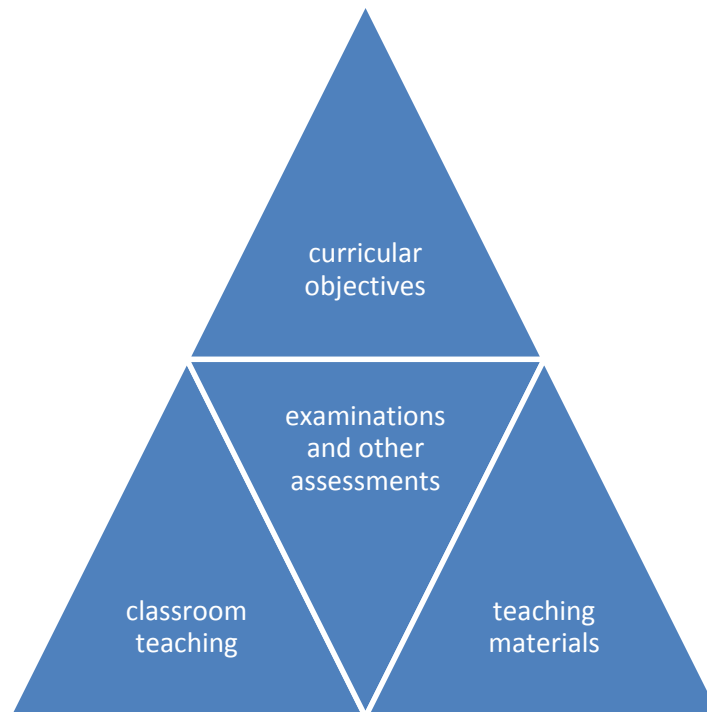


Figure 2-1. Coherent mechanisms for educational quality assurance

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In the Gulf States, the links between these mechanisms are broken. So, typically, what happens is that each curriculum is loaded with certain objectives that do not consider the ability of the university to manage the changes, given the level of resources available (Heyneman, 1988). Textbooks are designed without reference to or consideration of the divergence in student reading capabilities. As well, assessments are designed on academic principles about what is supposed to be learned by the students. This makes the educational system dysfunctional, so that it misses the quality and standardization found in advanced education systems.

2.4.8 Little or No Academic Freedom

Among the most important human rights is academic freedom. Academic freedom includes freedom of thought, freedom to develop opinions, and freedom to express these thoughts or opinions. The university as scholarly institution is the pulpit for its students and faculty. Thus, the university must guarantee a clear democratic system within its walls, to help both students and faculty express and publish their thoughts and views within a framework of public taste and social norms.

Many of the crises in the Gulf universities come from the fact that most of the universities are governmental institutions and receive financial and administrative support from the state government. Governments impose their rules and regimes rigidly. They implement such regimes without analysing the side effects of imposing such regimes on the university as a scholarly institution. Al-Rashdan (2009) argues that Gulf State governments impose many unsound rules and policies on their university systems. These rules cause the university to lose much of its academic status and lower the ceiling on academic freedom, which reflects on student and faculty opinions and publications. These lower levels of academic freedom result in lower levels of scholarly innovation. Furthermore, the increased restrictions on the university systems in the Gulf States have led to lower efficiency at the universities and lower effectiveness of their involvement in the economic development of the society (Farjani, 1998).

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One of the basic roles of the HE institutions in every society pertains to community services. These services depend mainly on the involvement of the university in the society and on a clear understanding of societal needs. The students and staff members cannot contribute to many community services unless there are proper levels of freedom to express their opinions and share in analysing public issues. In fact, lower levels of academic freedom lead to lower levels of critical thinking and problem analysis because the students are usually urged to follow certain routines and avoid exploiting many of their own thoughts. As such, they fear voicing their thinking and consequently miss the creativity skills and analytical approaches needed to handle many of the issues facing them or the society around them. Moreover, the absence of academic freedom affects scientific research negatively (Al-Rashdan, 2009). Under such conditions, researchers will miss some of the key research skills, as they are not used to expressing their minds freely in the academic environment.

2.4.9 Low-quality Research with Unclear Goals

Starting with the pre-university education, students (and the universities themselves) face many problems because of weak relations between the pre-university and university education. On the one hand, university students feel that the subjects offered to them are totally new because they realize that there is no proper preparation in the previous stages. For example, college of engineering students study math and physics, but at an abstract level, as if they had never studied math or physics before. For instance, they feel that algebra differs totally from the math they know about. This is a result of the non-relation between the subjects offered before and during university enrolment, which stems from the fact that the university curriculum does not consider what the students may have learned in their previous education levels over the years. Students feel that many of the scientific and epistemological components are new to them and find it difficult to connect these principles to what they have already learned (Al-Rashdan, 2008).

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On the other hand, the universities face many issues with respect to the shock that students feel when new subjects are introduced. For example, students may transfer from one college to another college or even from one university to another. This affects the balance of graduates as planned by the higher authorities to satisfy the society's needs.

Another issue that affects the quality of research negatively is the absence of the exchange of ideas between the different specializations in the university, stemming from university priorities. This makes it more difficult for the researchers to achieve deeper levels of research. Also, it affects the social philosophy by a way of lacking cooperation or coordination of research between the different specializations and/or departments of the university. This certainly leads to unclear HE strategies overall (Al-Rashdan, 2008).

The university's impact on its surroundings is also lower due to weak relationships with other universities in the country. These weak relations cause lack of meaningful inter-university discussions on mutual problems. Some Arab universities prefer to collaborate with foreign universities (Al-Rashdan, 2008), but this usually does not serve the research around societal issues well, considering the cultural barriers and differences. This poor integration between the different university programs across each country affects the quality of research in HE for all of the Gulf States. Furthermore, the missed opportunities for cooperation and integration keep the research goals unclear for researchers in the Gulf region.

2.4.10 Distance Education and Technology Are not Well-employed.

Distance education endeavours at HE institutions can identify similar characteristics of campus education, as well as facilitate education for remote students. In fact, many distance education programs in Gulf State universities still rely on printed materials, audio and videocassettes, and conventional ways of linking students and tutors through traditional tutorials that take place weekly or every other week. There is no evidence that new information and communication technologies are being used in effective ways (Heyneman, 2007). Some universities have already deployed distance education programs and made it available for students, but it is still not convenient for the

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students to enrol in them, due to the poor reputation of distance learning degrees on the one hand and the lack of central branches on the other.

Nowadays, modern e-learning technologies make it easier for learners to keep themselves engaged in classes remotely, in virtual modes. With new SC tools and networking capabilities, students can follow up on the class content and discussions, and participate in frequent assessments online. Also, in Gulf States universities, the assessments are summative and paper-based, even in the distance education programs. These assessments are held at the end of each semester or academic year. This makes it so the universities do not benefit from the distance learning technology and apply it according to best practices to gain room for formative assessments and increase the student learning rates (Abdeljalil., 2008).

Even with respect to post-graduate study programs, such as those offering master's and PhD degrees, the best known form of such programs in Gulf universities is full-time program, which requires students to attend subject classes in campus. Some universities in the UAE and Qatar are providing part-time degrees that offer options for evening attendance, but still require attendance on-campus and a significant portion of the studies are carried out offline.

Although some universities are already deploying e-learning platforms and technologies, they are using these in classes or just for facilitating content delivery. Many of these platforms, like the Blackboard Learning System and Moodle, are used in Western universities for distance education, but in Gulf State universities, they are used almost exclusively for content delivery. Most of these universities are missing many of the valuable educational tools that are available for collaboration, SC, and distance learning.

2.4.11 Weak Social Role of Higher Education

As per the culture framework of Hall (1990), the Gulf States are classified as High Context culture societies, which means that the people in these societies are obligated to traditional family bonds. This culture affects the study of social sciences and humanities subjects. Most of the humanities colleges focus on studying the local

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cultures and social communities. To some extent, HE is called upon mainly to reaffirm the prevailing ideologies (Shaw, 1997). The relations between the people in the Gulf States remains powerful, but the social role of managerial and professional merit remains weak. The weakness in the professional culture has led HE to fail to respond positively to the overwhelming pressures by providing a sufficiently strong element of leadership in the Gulf States societies. Moreover, the Gulf States failed both to develop their own responses and to participate effectively in parallel with the modern societies. This failure has led to a lack of autonomy and of qualified local staff, in terms of enriching the societies with expertise and successful leaders (Al-Rashdan, 2009).

On the other hand, the dominating norms in the Gulf States led to isolation between male and female students. In HE, this is translated into separate university campuses: one campus for male students and another for female students. In the workplaces, however, both genders must work together and some cultural conflicts appear between them. Such conflicts are considered as normal result of that earlier isolation experienced during their educational stages. Sometimes, these conflicts create inelastic work environments and lead to negative effects on production.

HE is supposed to have an effective role in providing suitable proactive solutions for such conflicts, and consequently on adapting to solve such conflicts in the earlier stages. This may lead to change in the organisational culture of HE institutions and, as a result, lead to change for the entire society over years. Some change management drivers may help in changing the culture in Gulf State universities in order to empower the social role of the university in the society. This may lead to an enhancement in the workplace as well, and it may affect the university surroundings overall.

2.4.12 Segmented Higher Education Sector

Most of the universities in the Gulf States are owned by the governments, especially the larger ones. As the only owners, the governments are provisioning the registration in universities for local citizens only (Mahdi, 1997). For instance, UAE University in the UAE announced on its website that 95% of the student enrolments are reserved for local students (UAEU, United Arab Emirates University, 2010). Such

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provisioning affects student competition and also the organisational culture in HE institutions. Local students feel relaxed because of the guaranteed educational services, a situation that leads to lower motivation levels in the students. Moreover, many of the work opportunities are saved for local university graduates, who enjoy higher priority regardless of their achieved scores or grades. These twin guarantees—of university seats and job opportunities—make the students feel as though there is no challenge at all in their education.

On the other hand, foreign students who have a chance to join the university are not allowed to join the highly ranked colleges or departments. For example, some governmental universities in Qatar and the UAE are reserving study in the faculty of medicine for citizens only. As such, secondary school graduates realize the unfair advantage this represents, and consequently, the majority of them choose either to travel abroad to find better chances in foreign universities or register in the available local universities, but remain unmotivated to study hard or achieve what they need. It also generates the problem that no equal opportunities are given to all students, which consequently generates negative attitudes toward the institution and lowers the creativity of the students.

Usually the culture diversity across the university society enriches academic study with variety of thoughts and useful competition (Abdeljalil,, 2008).. Thus, the universities in the Gulf States could gain a competitive advantage by admitting students from various cultures. Harnessing this mix of thoughts and minds could help increase the level of competition and awareness of the students as well. Furthermore, when students live together in a heterogenous society, the mix of cultures increases academic freedom and helps them develop healthy mental models for understanding other cultures, and perhaps even life overall.

2.4.13 Need for Further Expansion

During the last decade, the schooling system in the Gulf States has achieved noticeable levels of student enrolments compared to the previous two decades (UNISCO, 2006). This expansion is high in comparison to previous eras, but still not

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sufficient in terms of the youth population statistics. There are many students who register in foreign universities, in the USA and Europe. Moreover, there are many students who finish secondary school, and then enrol in military service or other community service organisations; some may even drop out from education entirely because there is no satisfactory diversification of attractive education opportunities in their countries.

Some cultural issues, such as the concerns about girls, make some families stop the girls' education after secondary school. Other girls also do not enrol in HE because the universities are located far from home and their parents do not want them to board in student hostels or boarding schools. As with girls, some families stop the education of their male children because they want them to go into businesses or the military.

Another issue is that poor student educational performance, which is a result of the previous educational problems, causes some students to drop out from education and become discouraged, due to their performance in classes or obstacles in learning a foreign language. Some of these students leave school and find their ways in business or in governmental service departments. As such, they have a pronounced negative effect on some other colleagues, who inherit the culture that disdains HE, as the work opportunity is almost guaranteed (Abdeljalil, 2008)..

However, dropouts from the local universities exist for of many reasons, such as the quality of HE and some cultural dimensions. Thus, enhancing the quality of the HE services can open more room for further expansion of HE in the Gulf States (Mahdi, 1997). Enhancing the qualitative and longer-term structural factors in HE can increase the student intakes in the universities, both for the citizens and the expatriate students. These enhancements can attract students to the university as an alternative to the open opportunities outside.

2.4.14 Weak Link between HE and the Development of Manpower

There is no doubt that one of the main goals of HE in any country is to develop the manpower of the society and provide educated workers. There is a real need for

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harmonizing the HE in the Gulf States with manpower development in a way that exploits the available resources and skills (Ibrahim, 1991).

The linkage of education with manpower development is one of the factors that ensure the efficiency of education and its adequacy to the society's needs. HE should develop to provide sufficient quantity along with competent quality of the human resources that are needed to contribute to the national development. Consequently, HE institutions should research and analyse the society's problems and, as far as possible, find suitable solutions for these problems. Then, they should develop their curricula and academic resources to satisfy these needs.

There are certain social and economic issues that call for interdisciplinary skills and knowledge to analyse them. As such, some of the HE institutions should develop the proper interdisciplinary studies to provide a broad social and historical perspective on these issues, something that cannot be achieved through separate academic disciplines. In the United States, there are several institutions that have organized interdisciplinary research and linked it with undergraduate studies (Balbir, 2001).

It is clear that most of the Gulf States economies depend mainly on oil production, while the bulk of university graduates in the Gulf States have graduated in the humanities, social sciences, and management sciences (Abdeljalil, 2008). Thus, most of the professional companies in the oil fields and related services, like electricity and water production, import foreign expertise from outside the Gulf region. Thus, HE outcomes in the region do not perfectly satisfy the needs for qualified manpower and human resources.

The HE in the Gulf needs more development in curricula, specializations, student recruitment, and orientation in a way that links academic studies with the society's needs for professionals and well-educated local labour.

2.4.15 Insufficient Funding

In most of the Gulf States, the governments represent the primary source of funding for HE. The growing needs of HE continue increasing and thus expose the limitations of that funding and its persistent insufficiency for the needs of the HE

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institutions. In order to balance the allocated budgets, some Gulf States have tried to reduce education expenses and urged the universities to add high tuition fees.

On the other hand, some of the Arab wealth is exported to the foreign universities where Arab students spend it there in tuition. This exported money helps the foreign educational systems to continue improving, while the local systems miss these incomes as a real source of support to goals for improving (Boumalham, 1999). The local universities remain underfunded and even work under policies for reducing their expenditures.

Both the low funding levels and lack of resources create undesirable deficiencies in terms of quality and the level of education overall (Heyneman, 2007). Also, they create negative repercussions in faculty performance, as instructors feel dissatisfied because of their salary scales and compensation levels. This consequently affects their innovation in promoting teaching methodologies and their desire to develop the education delivered in the university.

2.4.16 Investments in HE Are not Fully Realized

As mentioned, HE in the Gulf States is oriented to the management sciences, social sciences, and humanities. One of the main reasons of such orientation is that the majority of student enrolments are made up of girls who are limited, by the dominant culture norms, to working in “soft” jobs like school teaching and administrative positions. UAE University, as an example of the oldest and largest governmental universities in the region, has 75% of its student enrolments in the academic year 2009–2010 made up of girls (UAEU, 2010).

The university is located in Al Ain City, which is far from the capital city, Abu Dhabi, and from other major cities like Dubai and Sharjah in the UAE. The great distance makes it harder for the girls to work because the family prevent girls from working in faraway places as well as from working in any but the easiest jobs, for which the girls work 4 to 5 hours and get back home early. So, most of the girls who have graduated either work in those easy jobs or stay at home regardless of what they studied in the university.

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For example, a female graduate from the faculty of engineering may work as a school teacher or administrative assistant in governmental organisation, like a municipality, because her family prefers that job as being easy for her, over another suitable job in the capital city. Many similar cases can be found in the Kingdom of Saudi Arabia, which is one of the biggest countries in the region and whose universities are spread across many separate geographical locations, most of them far from the capital and industrial cities. Even small states like Kuwait and Qatar face similar issues because of the shared culture between all of the Gulf States and the low number of universities available in each country (Neave, 2008).

To realize the investment in HE, the society should be able to count on the real outcomes of universities as a translation of its needs. Those graduates who miss the proper work opportunities because of cultural barriers affect the country's goals for HE. They spend resources while learning at university and finally graduating not to work at all, or to work outside the planned specialization. Mahdi (1997) claimed that factors like the orientation in studies and domination of culture norms make it so investments in HE are not fully realized in the Gulf States.

2.5 Summary of the Chapter

In conclusion, HE in Gulf States institutions still has many serious problems, which might take the attention of many researchers in this region to find solutions for them. In this chapter, fourteen of the clear problems that negatively affect the final outcomes of HE in the Gulf States have been highlighted and summarized. These problems included those that seem related to economic factors like the need for more funding and greater investment in that sector on the one hand, and factors related to culture, like the weak social role of HE and the academic freedom issues, on the other hand. Certain other problems are emerging because of the recent establishment of the whole HE system in Gulf. These issues include the low level of professionalism and experience of the instructors who come from the Gulf States and the poor research and quality levels in HE institutions. These issues arise while rapid expansion is required to

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meet the soaring demand for HE in this region, which both turn out to be additional problems of HE in the Gulf States.

Chapter3

Social Computing in Higher
Education: Best Practices.

3.1 Introduction

Social computing (SC) tools facilitate communication and collaboration between users in variety of ways. These tools help learners collaborate together and develop the knowledge they need for specific learning. It can be thought of as the applications for sharing data and knowledge, and consequently to support creativity. SC imitates the face-to-face interactions that occur over time and space constraints. In education, SC help in integrating learning with the wider community and reaching out to the students' parents, education experts, researchers, and practitioners by way of making the institutional learning transparent and also opening new channels for gaining knowledge and enhancing skills (Owen et al., 2006).

The term *social computing tool* refers to any application that supports or fosters group interaction (Owen, 2006). There are a set of SC tools for a range of uses. It includes applications for podcasting (like Apple iTunes), blogging (like weblogs), social networking (like Facebook), collaborative content (like wikis), social tagging (like del.icio.us), multimedia sharing (like YouTube and Flickr), and social gaming (like Second Life) (Pascu, 2008).

Considering that the meeting of minds is at its core of HE, and that SC has potential impact on facilitating the meeting of minds regardless of bringing the bodies together, SC has a high potential impact on enhancing student learning in HE institutions. It helps to make the HE services that are linked to the institution more readily accessible and transparent to the different stakeholders of the HE institution.

3.2 SC Applications

As mentioned above, SC applications refer to the set of tools for blogging, podcasting, social networking, collaborative content, social tagging, multimedia sharing, and social gaming. In general, the term “social software” refers to any software application that supports the interaction between users. SC applications allow the users or learners to collaborate and communicate together in different ways. The following lines introduce the SC applications that seem the most suitable for learning and indicate the potential for using these tools in HE. Some of these tools appear to overlap because

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of their integration or dependency on similar services, but introducing them will show how they may be used in different ways to enhance the students' learning.

3.3 Social Computing tools for learning

The following section introduces a set of SC tools/platforms that can serve to promote student learning levels in education.

3.3.1 Blogs

The terms *blogs* and *Weblogs* were introduced for the first time in 1997 by Jorn Barger to refer to an online and public environment for writing and adding articles by an author or group of authors. These articles are known as *posts* and are displayed in reverse chronological order (Ellison, 2008; Anderson, 2007). Depending on the author's desire, the blog can include text, images, audio, and video content. It can also include a section for reader comments, and tools for searching its content. Over time, large numbers of people began blogging and these numbers continued growing until the phenomenon gained its own new name: the *blogosphere*. This term refers to the entirety of blog users (Anderson, 2007). The blogosphere was doubling every 5 to 7 months between 2006 and 2009, with a rate of 100,000 blogs created daily (Pascu, 2008). The estimated number of blogs on the internet reached 200 million by 2007 (OECD, 2007). With respect to education, a recent survey was conducted by Open Source Software Watch (OSSW) in the UK (2006); the survey found that half of the surveyed institutions reported using blogs. As well, some websites (like Edublogs.com) started offering blogs for academic uses by the educators and students.

In education, blogs can be used as follows:

- 1- By teachers, as dynamic learning environments that facilitate broadcasting course announcements, course calendar events, feedback to the students, and help the students to express their thoughts and understanding with the ability to interact and comment on each other's work.
- 2- By students to build their e-portfolios online to present their work and share thoughts with each other.

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- 3- Between groups of students to express their knowledge and share ideas together.
- 4- Between different groups of students and teachers to link and exchange ideas.

Some educational benefits may be reflected in student outcomes by using blogs in education. These benefits can be projected on the following areas:

- 1) Students feel free to express themselves in blogs, which may serve to enhance critical, analytical, and creative thinking on the student side.
- 2) As user-centred tools, blogs enhance participatory learning by the students and even highlight the authorial voices for every one of them.
- 3) Through interaction and collaboration between the students using blogs, they build stronger relationships with each other and experiment with the meaning of *persona*. Blogs help foster and develop civic and social skills.
- 4) Blogs can help enhance the students' writing skills and use of language. Moreover, this helps them realize the meaning of authorship, mental freedom, and responsibility.
- 5) Blogs promote student learning by enhancing communication between students, which also increases students' participation and motivates them more.

3.3.2 Wikis

A wiki is a website that enables users to add, edit, remove, and change its content collaboratively. Wiki content is usually text, but it can contain images, audio, and video as well (Owen et al., 2006; OECD, 2007). Unlike blogs, wikis have the advantage of history and rollback functions. The history function enables users to develop different versions of the content, and the rollback function enables users to restore previous versions. The best known example of wikis is Wikipedia (Wikipedia, 2011), which was created in 2001 and rapidly grew to have around 82,000 active contributors, editing more than 17,000,000 articles in more than 270 languages, and attracting 400 millions of unique visitors monthly by March 2011 (Wikipedia, 2011).

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Wikis may integrate with other websites through web links to audio, video, and other files (Warlick, 2006). One educational feature that serves collaborative writing but is not available in wikis is the tracking of the number of unique views. It can serve academically in assessing the students' contributions.

In educational settings, wikis can work well for many subjects. They are ideal tools for collaborative writing and group work. Projects involving multimedia and reading lists can be implemented through wikis. Study guides, text books, and subject-specific knowledge repositories all can be created using wikis as well. Moreover, wikis can serve in building school or class websites, meeting the need to engage broader-interest audiences and granting them the ability to contribute and comment directly on the website. The teaching staff can use wikis to scaffold collaborative projects as well (Bryant, 2006; Warlick, 2006; Bartolomé, 2008; Franklin & Harmelen, 2007).

3.3.3 Social Networking Services

As defined by Cashia (2008), social networking services refer to social spaces that are designed to facilitate communication, collaboration, and content sharing over a network of contacts. They enables users to share profiles and personal information, communicate by email, send instant messages, share announcements, blog together, and meet online with their friends or even new people. Many successful examples of social networking services are heavily used nowadays. Facebook (Facebook, 2011), LinkedIn (LinkedIn, 2011), Second life (Secondlife, 2011), and MySpace (Myspace, 2011) all are examples of these services.

In Europe, using social networking sites represents the third most popular activity on the Internet. By 2007, over 250 million user profiles were created on the social networking websites (Pascu, 2008). Recent surveys in the USA reported that 59% of teens who are online have created personal profiles on social networking websites like Facebook and MySpace. The interesting thing in these reports is that the most frequently discussed topics are education-related and focus mainly on collaboration around school work (International, 2008).

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Davies and Cobos (2008) provide some observations about why people tend to use the social networking websites, summarized in the following:

1. Explore identity
2. Engage in communities and self-expression
3. Keep in touch with friends
4. Develop new rapport and meet new people
5. Share content and exchange files
6. Access information and informal learning

Childnet International (2008) highlighted that the social networking websites are used heavily by the young demographic for discovery and exploration; the organisation pointed out the potential of the social networking websites to encourage users for self-directed learning. Moreover, Childnet International highlighted the following uses as having the potential for applying social networking services in education:

1. Fostering group collaboration and helping students complete their projects
2. Enhancing literacy and communication skills for learners
3. Helping students to develop their e-portfolios, where they can present their work and achievements, and promote their interests
4. Facilitate learning about copyright and data protection
5. Support learning of e-safety issues
6. Facilitate forming online communities around specific topic(s).

3.3.4 Tagging, Social Bookmarking, and Folksonomies

Social bookmarking services enable users to record (bookmark) their favourite website(s) and link them with a related title or word (tag) that expresses or summarizes the content of that page (Franklin, 2007). del.icio.us (Icio, 2011), Bibsonomy (Bibsonomy, 2011), and furl (Furl, 2011) are clear examples of social bookmarking service websites. The process of tagging websites with certain user-defined tags to organize them is called *folksonomy* (Owen et al., 2006; Vuorikari, 2007). The words that the user defines as tags for certain content are attached to that content and are defined as the folksonomic metadata of the content (Alexander, 2006; Vuorikari, 2007).

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As an example of how such metadata are used, the user can subscribe to certain tags on del.icio.us and receive a list of URLs that are attached to these tags.

The user of these services usually has an inbox which contains his or her bookmarks. He or she can subscribe to another user's inbox to receive that user's bookmark list in his or her own inbox, as well as update the list with more URLs of similar interest (Franklin & Harmelen, 2007). Many other SC applications are applying the concept of tagging to bookmark the user's favourite videos, music, blog posts, photos, podcasts and artefacts (Anderson, 2007). Flickr (Flicker, 2011) is one of the best known photo tagging websites. CiteULike (Citeulike, 2011) and Connotea (Connotea, 2011) are other examples of sites that use tagging, but for academic purposes. Both of them help organize research references by tagging them and sharing them with other users. Thus, these services make it easier for researchers to manage and discover scholarly references (Owen, 2006; Vuorikari, 2007).

In educational contexts, the potential of social bookmarking services to support education can be summarized in the following points:

1. Educators and learners can tag some websites as recommended educational resources, which may help them to bookmark and share websites that focus on certain areas or topics within their field of study, thus supporting their research and helping each other (Vuorikari, 2007).
2. Instructors and learners can build up collections of bookmarks and collaborate, using them to filter digital content on certain subjects or topics (Vuorikari, 2007; Franklin & Harmelen, 2007; Porto, 2008; Alexander, 2006).
3. With the tagging service, the librarian can develop pre-selected tag lists of resources to browse and use for their extend. These lists and collections can be used to build up tag clouds that facilitate browsing the digital content in many fields (Vuorikari, 2007).

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3.3.5 Syndication and Notification Technologies

Syndication refers to receiving the online updates of a given website's content automatically rather than going to that website and frequently checking it (Owen et al., 2006). The Really Simple Syndication (RSS) protocol allows the user to define a feed reader or aggregator, which help to centralize certain content from its website by pulling the frequent updates together in one folder that features a summary based on its content and that gives the user the advantage of clicking on the summary to see its details (Franklin & Harmelen, 2007; Owen, 2006). Syndication and notification through the RSS feed reader is not a particular SC tool, but it facilitates the organisation, inter-connection and coordination of the multiple online resources.

Educationally, syndication can help the both learners and teachers by managing the extensive learning environment through the defining of feeds for the content updates. For example, an instructor may publish certain subject-related material and may continue to update it from time to time. In this case, with the use of the feed readers, the students could receive these updates automatically, and the instructor receives notifications when the students update their responses (Owen, 2006). The same scenario can be applied for the new blog posts, changes in the bookmarking system tags, changes in the shared media and news updates.

3.3.6 Podcasts and Vodcasts

Similar to syndicating website content for audio, podcasting refers to conveniently receiving the content updates of audio content. Vodcasting is the same as podcasting but with the video content (Franklin & Harmelen, 2007). Podcasting and vodcasting are asynchronous modes of distributing the multimedia files. Unlike the other SC tools, podcasting and vodcasting are not very popular so far. Pascu (2008) reported that by 2008, only 2% of Internet users in Europe were using Podcasts; however, by 2007, Apple iTunes alone was hosting 82,000 podcasts online.

with the podcaster's making the podcasts available online through an RSS feed to which the users subscribe and for which they use their aggregator program (called

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Podcatcher). Thus, when a new audio file update is uploaded, users will receive it automatically on their portable devices to listen to at their convenience. Podcasting and vodcasting are powerful tools for distributing educational audio and video content. They are attractive to students who, with podcasts and vodcasts, feel free to learn anytime and anywhere and to listen to the podcasts or vodcasts as many times as they need. Even more, they can listen to the podcasts while commuting, exercising or doing household chores.

In the educational context, podcasts can be used as follows:

1. By educators to support their students with additional learning materials and resources. Podcasts can augment teaching by providing lecture recordings to the students (Franklin & Harmelen, 2007; Harris & Park, 2007).
2. As an alternative way of presenting the course work. Thus, a podcast can be used as an assignment for students. They can listen to it and answer related questions or even write a certain report.
3. As a means to present the institution or one of its units. For example, some podcasts can be published to introduce some of the institution's services, such as the institution's news, library updates or work hours (Harris & Park, 2007).
4. To keep engaging the institution's other stakeholders with recent updates and to reach out to the wider community. For example, a podcast can be used to inform researchers about a certain service or used to deploy a certain survey.

Many universities have reported using podcasts in Education. Even more, a number of them have announced making the content of some courses available to the public through podcasts. For example, in 2009, Harvard University announced its second year of podcasting the computer science course E-1 Understanding Computers and the Internet on the Internet, and this course had many followers and appeared on the top 100 podcasts on Apple iTunes (Harvard, 2011). Barkley University announced that 30 of its faculty members agreed to clip on a microphone during their lecturing times to record the lectures and to publish them on the Internet as podcasts (<http://itunes.berkeley.edu/>). Through its early initiative called 'Duke Digital Initiative', Duke University distributed 20 GB iPods to all of its first-year students to use as leaning tools. The plan was to deploy the educational technology, but one of the

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emerging technologies in the university's project was podcasting of the classroom recordings and field recordings. The University of Washington conducted an online survey for a podcasting pilot; the survey results reflected that 70% of the students found that the podcasts supported their learning and were very helpful for studying before exams and when preparing homework (Bell, 2007).

3.3.7 Media-sharing Services

Media-sharing sites store user-contributed media files, such as photos, videos, presentations, documents, podcasts and vodcasts, and allow users to search these files and to display their content. YouTube is an example of a media-sharing site that stores movies, Flickr (Flickr, 2011) is an example of a website for photos, iTunes (Apple, 2011) is an example for podcasts and vodcasts, Slideshare (Slideshare, 2011) is an example for presentations, Scribd (Scribd, 2011) is an example for documents, and DeviantArt (Deviantart, 2011) is an example for art work (Franklin & van Harmelen, 2007).

Media-sharing sites make it easier for students to access many educational videos. YouTube has many educational videos, for example. Aspire Academy for Sports Excellence in Qatar is teaching its student-athletes sports sciences and some other academic subjects, which requires many video recordings. They post the recorded videos online on YouTube, and the students watch them at their convenience so as to analyse them and to write reports for their teachers/coaches (www.aspire.qa). Some other institutions have developed special media-sharing sites for their students in an effort to make them use that technology and to keep them safe from inadequate, offensive content. TeacherTube is an example of these sites and contains more than 20,000 educational videos (Downes, 2008).

Nicole Ellison (Blogspot, 2011), a lecturer in one of the HE institutions in US, has used Facebook as a teaching tool and pointed out that Facebook made the subject more convenient for and easily accessible to students. She commented that Facebook provides more engaging learning environment and enhances the peer-to-peer social component (Redecker, 2009).

3.3.8 Online Office Applications

Online office applications are online software packages that enable the user to open desktop application files, such as Microsoft Office, as well as open office files; i.e. an online office application is a replica of a desktop application, so some users call it 'WebTop' or 'WebOffice'. Usually, WebOffice includes tools for word processing, multimedia presentations and datasheets (Redecker, 2009). The big advantage of these tools is that they allow for online collaborative editing, which means that many users can edit the same file at the same time. Google Docs (Google, 2011) for Word processing, Presentations and Datasheets, Backpack (Backpackit, 2011) for accessing common information and coordinating shared schedules, and Stikkit (Stikkit, 2011) for contacts, meetings, and e-mails are all examples of online office applications.

Online office applications can help a group of users to collaboratively produce documents online with the advantages of keeping the history of every work step, online discussion and annotation resource. In her blog, Vicky Davis (Blogspot, 2011) introduced an online office application for her collaborative project, which was conducted with the help of 40 educators who made 500 entries, authored and edited them in an online presentation using Google Docs, and commented on the advantages of using Google Docs's online presentation tool by mentioning that the collaborative editing helped the users to work together from home or at school with no need to buy software and that the users could chat together while editing.

In the educational contexts, online office applications can facilitate group work among learners, as they can edit content and chat together. They can also support educators by enabling them to publish their work for all students regardless of who has the required software runtime or not. They further facilitate commenting on certain content online and building the course content together. Moreover, they provide the potential of distance collaboration anytime across the globe.

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3.3.9 Virtual Worlds and Immersive Environments

Virtual environments provide users with three-dimensional (3D) digital environments to which the users subscribe, and these users can start to develop their 3D worlds by building, displaying and storing their virtual creations (OECD, 2007). In these environments, the user is represented by a graphical representation called an avatar. In the 3D digital environment, users can host events or real university courses (De Freitas, 2007). SecondLife (SecondLife, 2011), Entropia Universe (Entropiauniverse, 2011), Dotsoul Syberpark (Dotsoul, 2011) and Active Worlds (Activeworlds, 2011) all are examples of the virtual environments available on the Internet. Second Life has succeeded in attracting millions of ‘active residents’ and still continues to experience rapid growth (Pascu, 2008). In March 2007, about 500 universities and research centres along with 2,800 educators had made a presence with activities on Second Life (Calongne, 2007).

The New Media Consortium (NMC) conducted an early survey in 2007 about using Second Life in education. The survey was taken by 209 educators who already use Second Life in their classes, and they reported manifold uses of it for educational purposes (NMC, 2008). A total of 60% of the surveyed educators took classes on Second Life, 51% had done activities including supervising class projects on Second Life, 58% planned to teach classes on Second Life, 50% were doing class meetings, 46% were conducting research, 47% conducted their office hours virtually on Second Life, 34% provided student services and support activities through Second Life, 34% were mentoring student research projects, 8% taught real-life classes entirely on Second Life, and 19% were planning to do so.

About The survey questions included a part regarding the potential of Second Life, or the 3D virtual environments in general, to support educators and learners, and the respondents expressed that they saw a high potential of deploying them in HE (94% of them). A total of 87% of the respondents saw a significant use of Second Life in simulation and scenario activities. A total of 86% saw its effectiveness in artistic expression, 78% saw its high potential in group work, collaboration and meetings, 74% saw its potential in distance learning programs, 73% saw its potential in team building,

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68% saw its effectiveness in professional development, and 60% saw its significance in teaching full courses.

3.3.10 Web 2.0 Tools Designed for Learning Purposes

There are some online Web applications that are tailored especially to education and that provide the capabilities of collaborating online; create online courses and add content to it; provide online assessment tools, such as tests, surveys and question pools; enable learners to contribute in wikis and blog activities; and provide some announcement and calendar tools (Stemmer, 2007). One of these free types of software is Moodle e-Learning platform. It has significant implementations in HE with a database of users that includes 49,952 registered sites serving 37 million users in 3.7 million online courses as of October 2010, according to Wikipedia (wikipedia, 2009). Another example is Elgg (Elgg, 2011), which is an educational Web service available as open source software, which is known as ‘Learning Landscape’ and provides a blog management system, file repository, user profiles to discover people with the same interests, and the ability to import and export to the other known social networking sites (Calvani, 2007).

An example of providing an online e-learning environment supported by the virtual reality mode was started by a new open source project that targets integrating Second Life and Moodle in a new educational platform called ‘Sloodle’ (Sloodle, 2011). It aims to develop sound pedagogical model for teaching in a Web-based 3D environment with all of the features of the learning management systems, which is expected to make teaching easier and to achieve higher rates of learning.

There are many other examples of the educational SC applications that were started as initiatives from some universities and are now available for free as open-source platforms. San Francisco-based initiative Wikispaces (Wikispaces, 2011) is one them, which started in 2006 and provides thousands of wikis for free for educational purposes (Geser, 2007). ‘Escribamos’ is another example of SC software that is designed for education. It was developed by Calliope, a Belgian multilingual online writing centre, and it works as a collaborative writing environment and provides a tool

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for creating e-Portfolios (Opdenacker, 2007). An additional example is ‘MASSIVE’, which is a peer-review service for universities (Attwell, 2007). The learning activity management system ‘LAMS’ is another example that was developed in UK to provide several Web 2.0 tools for collaboration between students and educators (Aliyev, 2007).

3.4 Benefits and opportunities of applying SC in HE

There is no doubt that the new digital technologies have changed the learning styles and strategies. On the other side, the SC tools facilitated a paradigm shift in the use of technologies, especially with new mobile devices that have now become available for all people everywhere. Along with this change of lifestyle, cognitive processes and knowledge acquisition patterns have appeared. Integrating the SC applications in education is one of these patterns because this integration has many benefits for educators and learners. Rudd et al. (2006) mentioned that the SC technologies offer opportunities for flexible learning, which provides the learners with extra opportunities to engage in learning in diverse conditions and environments outside of the institutional learning.

Attwell (2007) argue that new opportunities are available for education and training systems to face the societal challenges. Attwell (2007) claims that the current educational system becomes dysfunctional in response to real societal demands, because it is not supporting society with the competences and skills that are actually needed. Moreover, he argues that the education system has to start encouraging student creativity and networking outside of the educational institutions instead of making the institutional education isolated from real life.

Fischer and Sugimoto (2006) emphasize that industrial nations’ transition to the new information age was faced by a deep shortage of creativity and innovations. They claim that much of human creativity is developed through collaboration and interaction between individuals. Thus, according to them, the potential of SC tools to support collaboration can serve in raising creativity and innovation. On another claim, Rudd et al. (2006) add that more creativity could be developed through the generating, sharing, editing and publishing of materials collaboratively between individuals. Coenen (2006)

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agrees with the same argument and also claims that the knowledge-sharing between people that takes place through the use of social software may be able to influence their creativity, as creativity occurs when they associate the previously unconnected concepts in their cognitive systems, which need the integration of knowledge from various fields. This integration can be developed via the different contacts over the different domains, which, in turn, is related to communication in the social network structure. SC simulates face-to-face interactions without space and time constraints and helps users to exchange and to share knowledge effectively; thus, it supports human creativity (Coenen, 2006).

The educational and social research increases understanding of the learning processes and how they depend on networking, collaboration and connected properties (Rudd et al., 2006). As per the summery offered by Rudd et al. (2006), the following are some of the research results:

1. The construction of knowledge occurs between learners and experts.
2. The progress in learning increases greatly when problem-solving occurs between learners in collaborative work.
3. When individuals become active participants in collaborative communities, they learn easily, and learning occurs best when they share mutual interests and exchange resources to resolve problems or to understand issues.

Rudd et al. (2006) emphasize that the voice of the learner should be heard, and his/her role should be changed by putting him/her in the centre of the education process. They argue that using the SC tools can blur the boundaries between the learners and educators and can empower the learner to become a creator, editor, publisher and peer tutor. They note, too, that the collaboration and knowledge exchange that occurs by using SC tools can enable peer-to-peer learning and help to overcome structural barriers to participation.

Green et al. (2005) argue that using SC technologies enables learners to tailor their learning to match their interests, to exchange knowledge with colleagues, to share ideas with experts and to collaborate with people who can support their learning. This adds greater personalization to education, which results in reshaping the education system to focus on the learner. Alexander (2006) points out that the low entry barriers

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of SC applications offer new learning methods and forms of self-expression. Franklin and Van Harmelen (2007) have observed that high interest exists among the educators in HE to explore new pedagogies for supporting education with more effective ways of teaching and learning, which may be achieved by using SC tools in HE. They claim that the SC applications can support universities by producing independent and self-directed learners, i.e. learners who can define their learning goals, strategies and plans to achieve these goals as well as reflect on their learning outcomes, which itself results in learning.

3.5 SC Strategies for Pedagogical Innovation in HE

Throughout Europe, many experiments use SC in HE and training to develop new, innovative ways of enhancing learning and supporting the educators with information and educational services through the using of regional educational networks (Geser, 2007). Redecker (2009) introduced the iLANDS model for exploiting the SC technologies in HE so as to develop innovative approaches in the learning pedagogies and in the educational organisation. He divided the landscape of using SC in education into a group of clusters, or islands, that may highlight the potential of using SC in education. The following lines represent the iLANDS model in an effort to explore the best practices of applying that model and of achieving real innovations in HE.

The current practices of using SC in HE highlight four innovative perspectives regarding its uses. These perspectives are: learning and achieving (LA), networking (N), embracing diversity (D) and opening up to society (S). Under this section, the best practices in the first land (LA) will be highlighted as experiments for the pedagogical innovations in education. However, in the next section, the rest of lands (N, D, S) will be introduced as contributions to the innovation in the educational organisation.

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3.5.1 Learning and Achieving (LA)

SC facilitates learning and extends the learning environments to flexible domains of the resource availability, community engagement, learning personalization and support of the learning progress. It can support the innovation in the learning pedagogies by giving rise to new ways of knowledge acquisition as replacements of the old teaching and learning patterns. SC offers opportunities for flexible and distributed learning, which helps the students to be more engaged in learning, and thus, it is expected to result in promoting the learners to embrace independent, autonomous and self-directed learning levels with enough collaboration skills to interact with a variety of people and colleagues so as to acquire more knowledge and to support each other's learning as well.

To explore the best practices of using SC for pedagogical innovation in education, the following prototypical areas will be highlighted, where the SC applications are commonly used with specific learning objectives. These areas are:

i. Access to Learning Materials

SC makes it easier for educators to generate and to distribute learning materials for their students. Blogs can be used for broadcasting announcements, distributing material files, uploading learning resources' links and posting feedback on course content. In Spain, the University of Salamanca implemented its projects "Blog de Pedagogia Comunitaria" using blogs, wikis, YouTube and Slideshare, which are all SC tools, to facilitate learning the subject 'community pedagogy' between the students and their instructors. The periodic updates of the learning materials and information were distributed through RSS feeds, and the students were able to share their thoughts and to build their own glossary using the blog and wiki tools. The evaluation of these tools in the project approved that the students' writing and collaboration skills were improved as well.

Podcasts became a very popular tool in HE for lecture recordings and for providing students with audio/video materials (Deal, 2009). Podcasts are attractive to

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learners they allow students to learn at their convenience and to listen as much as they desire to the recordings. Moreover, they can use the fast-forwarding feature to jump to a certain point in a recording and to repeat a particular part of a lecture as they like. Stanford University used podcasting through Apple's iTunes platform to distribute course materials and recordings to its students (Stanford, 2011). The University of Austria and the University of Switzerland in Germany developed the joint project 'Podcampus' (California, 2011) for publishing podcasts and vodcasts—some for university courses and some for public, including speeches and language-learning recordings (Redecker, 2009).

ii. Personal Knowledge Management

Many practices of using SC in HE in Europe have approved that the SC applications are effective tools in research and knowledge management. The learners and educators can build their collections of resources, create bookmarks, set up resource lists and comments, and recommend and rate educational resources using the tagging and bookmarking services (Vuorikari, 2007). The University of Pennsylvania (Catalunya, 2011) used the bookmarking services to build its projects 'Penntags', in which the resource links can be tagged, organized, stored and exchanged (Alexander, 2006).

Wikis also can be used for developing knowledge repositories and knowledge bases. Similarly, blogs are effective tools in building up a corpus of interrelated knowledge from the collection of learners' individual blogs in an academic institution via their comments and posts (Baggetun, 2006). In 2006, the University of Salzburg built its 'Wikibook' project based on the 'Soziologische Klassiker' wiki (UNSW, 2011), which was lent as an encyclopaedia of important sociologists and edited by 70 students who were writing and editing related articles. The next year, the project was enlarged to include an extra 60 students. Another project was started in the Public Administration School of Catalonia to design e-learning materials for some e-courses using wikis to provide an editable environment for the instructors, course editors and

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trainers to showcase their knowledge and ideas with the ability to share thoughts and to collaborate (UMBC, 2011).

In a study of the wiki's role in knowledge management, Barth (2007) pointed out that the students appreciated the use of wikis to collaborate and to build a knowledge base. They confirmed that the wiki helped them in solving problems and in managing different forms of knowledge. In another study in UK of university students, Conole et al. (2008) studied the effects of using SC tools on the learning patterns of the university students and found that one of the main features of using SC in HE is the peer-to-peer support and communication. The same findings were highlighted by Baggetun and Wasson (2006), who investigated the influence of using blogs in HE on the students' learning and found that blogging supports self-learning through its capabilities of building a knowledge base and repository where the students post their thoughts about the subject topics and issues and support one another.

iii. Subject-specific Methods and Tools

As per the properties of the SC (SC) tools of facilitating communication and collaboration, SC can be harnessed more in specific subjects to develop innovative ways of learning so as to reflect the nature of these subjects. The SC tools help learners to produce, modify and share audio, video and photo content, which consequently can serve more and support the creative engagements in music, design, arts, composition and similar majors (Reinmann, 2008). At the University of Mary Washington, the students study in a course called Approaches to Video Art, which introduces the video as an art form; then, they submit their projects as vodcasts (Podcampus, 2011) in such a way as to link the student activities to the subject matter. The 3D virtual world on Second Life is suitable for replicating and for investigating virtual reality as needed in medicine, architecture, history, geography and metaphysics studies. Ramasundaram et al. (2007) developed a 3D virtual Web environment in the form of a virtual laboratory to simulate the students' work in studying some environmental processes in space and time. Another example of using the 3D virtual environments was introduced in the WISE project, which was started at the German RWTH Aachen School of Architecture.

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It set up SecondReiff, a virtual architecture of the university campus on Second Life in an effort to provide the students with a 1:1 scale modelling environment, which helped them to collaboratively design realistic artefacts using the full scale in the virtual environment.

‘Ardcalloch’ (Upenn, 2011) to transform the academic law studies into practical vocational practices. The students play the role of legal practitioners who operate in Ardcalloch with access to databases of legal documents and with forums to discuss issues with practitioners as tutors (de Freitas, 2007). Moreover, in humanities and arts studies, the 3D virtual worlds have been used effectively in supporting theoretical studies. Reihman (2007) used Second Life in a philosophy course to facilitate understanding of the reality and existence theories (Redecker, 2009). He noted that Second Life made it easier for the students to understand the metaphysical concepts and ontological views. The students of the art history subject in the university of British Columbia (Canada) also used the game-like 3D virtual learning environments to conceptualize the First Nations studies by displaying ancient sites and then commenting, critiquing and amending them collaboratively with their peers online (Wikibooks, 2011; Rauch, 2007).

iv. Motivation and Personal Learning Skills

Increasing student motivation and participation is one of the main outcomes of using SC in education, as the SC tools promote the student creativity, authorship and collaboration (Redecker, 2009). It keeps the student engaged, which results in enhancing his/her personal learning skills. Virtual worlds in HE increase student engagement and motivation, resulting in supporting the education and training and empowering learners (de Freitas, 2007; NMC Horizon Report, 2007).

To support the business studies at the University of Glamorgan, UK, a simulation game engine (Continguts, 2011) was developed in a project designed to enhance student engagement, motivation and creativity (de Freitas, 2007). The engine was designed to assign each student an avatar that asks questions and provides answers as per the student’s choice. The engine’s use was extended to be used in the college of

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care sciences by the paediatric nursing students to create virtual wards and to practice admitting children who suffer from fever and then treating them. Furthermore, the avatars on Second Life can be used in similar ways to take part in an online course, meeting, project or class. As an example, Peter Twining, at the Open University in UK, directed a project of studying the potential of the virtual worlds in supporting student learning for the teen-aged, 13-to-17-year old, students. The project titled 'the Schome Park Project' (Umwblogs, 2011) and was developed as a closed community on Second Life. It witnessed educational activities such as creating wikis and discussion pages for discussing topics of ethics, physics, languages, philosophy, research, media and design.

The Bradley University also used Second Life to offer some courses on research methods (Ukcle, 2011). Like Bradley University, the Rochester Institute of Technology developed a similar virtual environment for the students to collaborate and to interact through 3D virtual representation as well as to create some data visualization by using two-dimensional (2D) and 3D virtual objects (Ardcalloch, 2011).

Podcasts, blogs and wikis can also promote personal learning skills and enhance student motivation and participation as well (Redecker, 2009). At the University of Sheffield, de Laat (2007) studied how the students of the online master's degree in e-learning can build an online learning community. He found that the students were motivated and participated in many collaborative activities. They were planning tasks together, designing online course activities and discussing group work activities. As Antoniou and Siskos (2007) noticed in the Greek postgraduate master program in physical education, wikis were encouraging the students in active participation and helped in beating isolation via its collaborative writing style and interaction between the students and tutor, which consequently resulted in better learning outcomes.

Lee et al. (2008) studied how SC tools can enhance students' learning and social skills in their project with a group of undergraduate first-year Australian students who volunteered to collaboratively script and to create educational podcasts for their student peers. They found that podcasts helped the students to enhance their social perspectives through the group discussions surrounding the podcasts' content and the negotiation of its meanings. The podcasts also stimulated both individual and collective learning. In another initiative of using podcasts in HE, Frydenberg (2007) asked a group of students

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to summarize the course content using podcasting and found that the students were encouraged to work on that task and assumed responsibility for the course as teachers and multimedia producers, which empowered them to collaborate and to develop better results.

De Laat (2007) analysed 32 independent studies on how ICT can facilitate collaborative learning activities. He observed that students take control of the learning agenda and become concerned with how to approach their task. The personal interests and learning goals were the most effective drivers, so peer help was the most supportive for learning. On the other hand, wikis also support the student's desire to take responsibility for the course content and to become the co-author or co-producer of digital content instead of being a passive consumer of information, which reflects self-directed learning and reflection processes (Barth, 2007). It also reflects the students' desire to tailor the course content to match their needs.

SC tools provide an attractive environment for the students to communicate, collaborate, peer-support and contribute in developing their learning in self-directed ways. This confirms the strength of SC in supporting student creativity, motivation, engagement, social skills and self-directed learning.

v. Higher-order Skills and Meta-competences

The online collaboration tools, such as blogs and wikis, enhance the metacognitive knowledge and skills for the learners in the learning environments (Laat, 2007). In the U.S. college setting, 44 undergraduate students were engaged for one complete academic semester in an online community that was set up by Xie et al. (2008) to investigate the collaboration effects on the students' learning and meta-cognition and how the online community could enhance their reflective thinking skills and learning approaches. They had to update their individual blogs weekly. It was noticeable that the students' reflective thinking skills were significantly increased.

In their study of the use of an online journal in the postgraduate distance learning program in physical education in Greece, Antoniou and Siskos (2007) found that online writing encouraged students to participate actively, and their critical thinking and meta-

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cognition skills were enhanced significantly. In another online master program in Italy, Carletti et al. (2008) studied the effects of using blogs and online work diaries by 280 teachers who joined the program, and they found that their reflective activities and professional competences were enhanced in noticeable ways. The last example illustrates how the online writing environments can promote the long-life learning as per the pre-structure of these environments. Kanuka et al (2007) used the online discussion boards to analyse the postings of a group of undergraduate students and found that the well-structured and clear definitions of roles and responsibilities helped the students to express high-contribution phases of cognitive presence.

vi. Improving Personal Achievement

One of the most important features of the SC tools is that they can promote innovative learning methods, which can help the learners to improve their individual performance and elevate their academic achievement. Three areas can be identified as the learning outcomes' enhancement areas. These areas are: (1) the subject-specific skills, (2) the personalization of the learning processes and (3) the collaboration and networking strategies.

1. Subject-specific Skills

Many projects exploited the SC tools to enhance the students' digital skills, improve their writing and publishing skills and facilitate their e-learning as well. In Taiwan, Chang et al. (2008) implemented Web-based coursework platform called 'Coursework Journal' for 51 undergraduate students to work on the development of an online journal publishing community. They evaluated the achieved work through data analysis and questionnaires, which resulted in the collaboration tools' improving the quality of the coursework, promoting knowledge-sharing and raising the learning performance of the contributing students.

Another study was conducted by Ducate and Lomicka (2008) on the use of blogs to enhance the learning of the foreign languages between 29 U.S. university students

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who enrolled in French or German. They observed that the blogs increased motivation and promoted the students' creativity. A similar study was conducted by Hirvela (2007), who investigated the use of blogs and wikis as writing environments to promote collaboration between 108 undergraduate students enrolled in English as a second language (ESL) writing course. The students were assigned a novel on which to comment and exchange views with the author. They pointed out that the students posted many comments, collaborated positively and were encouraged to co-construct an understanding of the novel. They also were engaged in useful writings about the novel.

2. Personalization of the Learning Processes

As mentioned in the earlier section, SC help in making the learning materials available for students, which enables them to manage their personal learning strategies. It fosters personalization, as it allows them to establish personal knowledge repositories and to express themselves online in virtual environments as they prefer.

A study on 196 undergraduate students in the college of business and economics in a university in UK was conducted by Evans (2008) to assess the effectiveness of podcasts in assisting the students who were doing exam revisions; the study results reflected that the students liked the revision using podcasts more than using the textbooks. The statistical analysis of the subsequent questionnaire results indicated that the students were more receptive of the podcasts than of the traditional notes and textbooks, and they liked the flexible learning style of podcasts, as they could learn where and when they preferred as well as listen as much as they liked.

3. Collaboration and Networking Strategies

Collaboration helps the learners to extend their personal knowledge base through more active engagement with peers and to benefit from each other's support. Delft University in Netherlands implemented the 'Wiki meets YouTube' project (Ubc, 2011)

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in which 100 undergraduate students worked on explaining the course material of the Advances in Networking course using podcasts, vodcasts and graphics and to collaborate on a wiki prepared for the task. Both the students and instructor were satisfied with using the wiki as a collaboration environment. The students found it easier to communicate and to interact with one another, and the instructor was happy with being able to monitor their learning process through the wiki. Another project is running annually at the same university for the master students in systems engineering for a 14-week project. The project depends on a wiki (Twiki) for collaboration and knowledge management between the program students (there are usually 20–25 students each year) (Ubc, 2011). Twiki is also used for writing communal reports and preparing case studies.

SC facilitates collaboration and communication among the university lecturers as well. Two groups of 80 lecturers at the Open University of Catalonia (OUC), Spain, were collaborating together, using a mix of the SC tools centred on two cross-curricular subjects they taught. They agreed on the benefits of using the collaboration tools, such as knowledge exchange and peer support. They also confirmed that the collaboration tools strengthened their interpersonal bonds, promoted a sense of community and empowered the work atmosphere positively (Guitert, 2007).

Another form of collaboration is the collaboration between the different institutions, which can promote subject-specific skills. In Singapore, an online collaborative writing project was implemented between two first-year university classes from two different universities by Cavallaro and Tan (2006). The classes were about report writing, and the foundations indicated that the online collaboration enhanced the quality of work. Another project at the University of Michigan was started by Gibson (2005), who developed a distributed learning blogosphere for 31 students to collaborate. A total of 845 posts were added by the students, and 86% of them were comments on learning content and were ranked as high-level in terms of the interaction and collaboration. Gibson's (2005) findings revealed that 95% of the engaged students confirmed that the blogging enhanced their personal learning.

In their research study, which involved 32 students from the Universitat de Lleida, Spain, Cobos and Pifarré (2008) investigated how to construct the collaborative

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knowledge using the CSCL system tools, which facilitate sharing, commenting and rating documents by adding notes. The students commented on one another's documents, and the study pointed out that 50% of the students' comments were categorized as 'addition', and the rest were among 'Explanation', 'correction' and 'delete'. Cobos and Pifarré (2008) observed that the students were interested in monitoring one another's work and in the self-assessment and peer assessment styles. A total of 68% of them explicitly expressed that the peer comments enhanced the quality of work, and the 'addition' and 'correction' comments have significantly improved the documents.

Another example was a study conducted at a Taiwanese University by Liaw et al. (2008) and involved 178 students. The study used blog and wiki tools for collaboration among students and resulted in the positive evaluation of the students' performance, which improved as a result of the online group collaboration (Liaw et al., 2008).

To sum up, the potential of SC to improve personal achievement and performance is huge. SC serves in enhancing writing and foreign language skills. In fact, it promotes digital skills as well. Moreover, it enables the learners to personalize their learning strategies, adapting different methods and tools to their needs and priorities and collaborating about the learning processes, which all result, consequently, in raising their achievement levels.

3.6 SC practices for innovation in the educational organisation

This section lists the rest of the factors that show the potential of SC for creating an open society that is accommodating to users and a transparent learning environment. These factors thus build this environment, which is affected by organized learning, and illustrate how the SC applications can contribute to organisational innovation in education and training. SC re-integrates the academic institution into the community (S), transcends borders between countries and organisations (D), empowers collaboration between the social networking environment participants and transforms the learning environments into communities (N).

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3.6.1 Networking (N)

SC helps the learners and educators to build their communities and networks, which facilitate knowledge and material exchange, develop a network of assistance and understanding, and create a collaborative environment that helps in better understanding and discussing the subject-related topics.

Not surprisingly, many educators, researchers and learners have appropriated the networking services for exchanging the learning-related knowledge. As an example, ResearchGATE (GlamUniv., 2011) is a Web-based community that is developed for scientists as an environment for collaboration around the different research fields. It was built to offer a Facebook-like social network for researchers. Another example is the Eurotrainer Virtual Community, which is a social network for professionals in the field of vocational education and training (VET); it aims to facilitate knowledge-sharing, opinions and experiences in addition to developing a partnership on common documents.

In the EU-funded ESMOS Socrates-Minerva project, BSc Adult Nursing degree students at the University of Salford used a group blog during their internal practical internship in UK and abroad to develop an online community for enabling group discussions and for sharing key observations (Redecker, 2009). The preliminary evaluation indicated that the collaboration via the blogs was useful in facilitating the peer-to-peer and student-tutor discussions, so that enhanced the practical, social, psychological and academic support as well, especially for students who travelled abroad for clinical placements. Furthermore, the blog was used as a reflective space and as a collaborative bibliography for the students, and it enabled them to upload their work presentations for the other members and to receive questions and feedback from all of the group members (Keegan, 2007).

Another example of using the social networking system for students and faculty members to share resources, academic interests and create personal portfolios was at the University of Brighton, UK, who set up 'Community@Brighton' (Schome, 2011) as the virtual environment for the collaboration and incorporation of materials and other resources from other social networking websites, such as MySpace. In the same

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way, the University of Leeds developed its online community using the open source social networking engine 'Elgg' (Wiki, 2011). The students and staff created many blogs and used them as a resource sharing platform and as democratic spaces to meet new people and to talk about their lives and studies.

Many other projects were conducted in some other European universities to exploit the SC tools in developing more effective virtual learning environments. 'Puikkari' is one of these projects that was set up among three Finnish universities of applied sciences that aimed to develop a collaborative and accumulative learning environment to use for knowledge-sharing and collaboration (Suhonen & Uimonen, 2007). 'LTEver' is another initiative that was started in Italy in 2007 to join students who are interested in continuing self-learning online. The learners, educators, and alumni students could create blogs, discussions, their own personal spaces and build communities for free (Calvani, 2007). The qualitative evaluations of these projects indicated that the social networking platforms extend the limits of the institutional instruction through the development of learning communities that are independent of space and time.

3.6.2 Embracing Diversity (D)

SC helps the learners to open new channels for gaining knowledge with the different parties from the outer community. It helps in facilitating communication and collaboration between the learners from different ages as well as among the learners and experts, practitioners, and researchers and many other people from different cultures and backgrounds.

The iCamp project (Bradley, 2011) under FP6 is cross-border leaning project based on collaboration for solving problems, develop cross-cultural relations, and exchange knowledge from different backgrounds. It started with 36 students (graduate and post-graduate) from universities in Poland, Lithuania, Turkey and Estonia. They was classified into five groups, with each group mixed of students from the participating countries. These groups used the SC tools extensively to collaborate on the given task. They used Flickr for sharing images, Wordpress for blogging, Flashmeeting for

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teleconferencing, MSN for chat and email, Google Docs for shared-document editing to develop questionnaires, Delicious for bookmarking blogs, defining reading lists and addresses of the questionnaire delivery addresses, and Netscape for sharing workspaces. iCamp illustrated the potential of using SC in an intercultural context among a group of institutions from different cultures and countries so as to develop communities for collaboration on topics and problems. It was an ideal tool to facilitate communication among participants, and it encouraged the students to discover languages and traditions. There are many small-scale projects in HE to exploit SC in an effort to open the classroom to the surrounding world so as to develop new spheres of collaboration, inspiration and reflection and to keep connecting these insights to subject-related topics and problems.

3.6.3 Opening up to Society (S)

SC helps in engaging other parties and makes institutional learning accessible to them. It makes it transparent for parents, experts and the other stakeholders of HE to access the institutional learning information that is related to their relationships with the institution. For sure, it facilitates the access to that information for the current and prospective students.

Many HE institutions use SC to present themselves to society and to communicate with current and prospective students. The University of Warwick (Rit, 2011), UK, set up a profile on Myspace to provide information and a meeting space for current and prospective students. The Spanish Open University of Catalonia (UOC) created a profile on Facebook to present itself to society. It has a Web presence on Twitter, too, and has a channel on YouTube as well (E-merge, 2011). Many other European universities followed the UOC and have the same presentation on the Web. The University of California, Berkley, USA, offered full course lectures on YouTube with 300 hours of content (Youtube, 2011; Childnet, 2008). The University of Edinburgh started to test a new strategy of exemplifying the SC opportunities to enhance the online learning environment. It replaced its newsletter with blogs and RSS feeds, managed the courses' reading lists using the social bookmarking tools, published

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podcasts for the public lectures on its website, and built an online community for the postgraduate students using Frappr (Frappr, 2011) to develop a sense of community among the international students. Similarly, the Universities of Brighton (Brighton, 2011), Leeds (Leeds, 2011), and Westminster (Wmin, 2011) in UK implemented many of the SC tools to enhance their services. Many universities nowadays consider the way in which students use the SC tools extensively to present themselves, to communicate with others and access information via a natural activity and to try to reach students through the same communication methods that they like to use.

3.7 Social Computing and Culture

Musings (2007) states that “SC is something of a pan-cultural phenomenon’. He mentions that half of the one billion Internet users on the planet are using SC. The uptake of SC differs from culture to culture (Musings, 2011). Socio-economic factors play a role in using SC. Considering the high speed of Internet access, developing countries, such as Brazil and Mexico, have faster uptake rates of SC than do developed countries, such as UK, Canada and USA. This reflects the fact that access to technology is not the only factor in using SC, as culture plays a role in it as well (Musings, 2007). Figure 3-1 shows the resulting graph of the relationship between the use of social networks and the Internet speed, which was conducted by Ipos Insight (2007).

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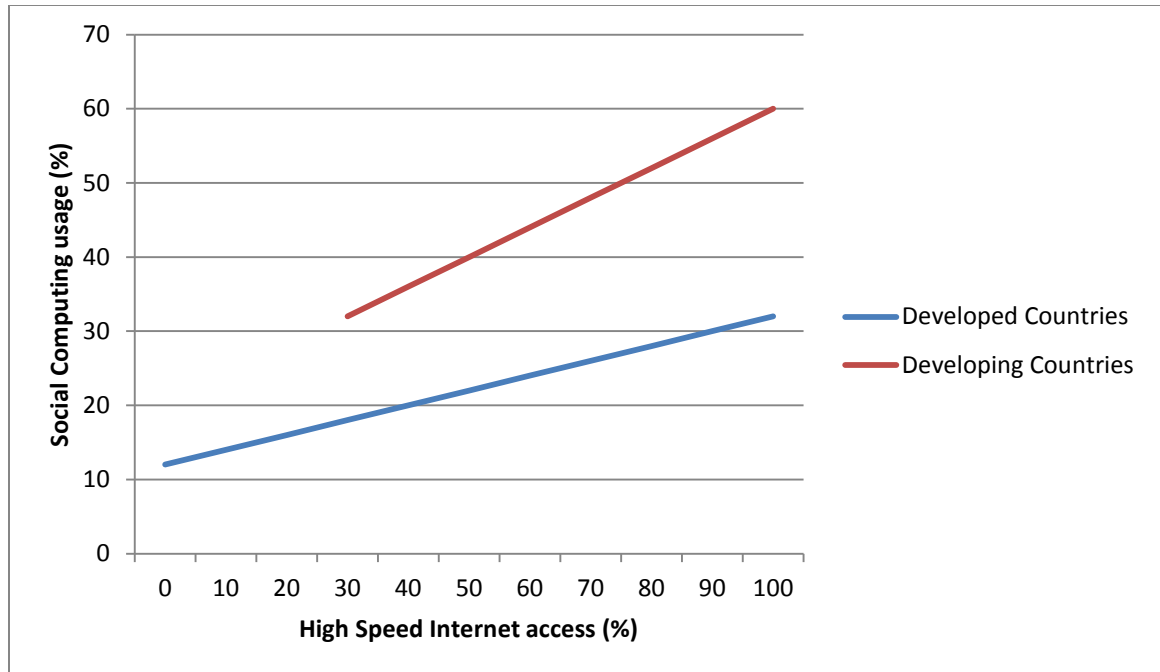


Figure 3-1: SC Usage against High-speed Internet Access for Developing and Developed Countries—source Ipos Insight (2007)

When comparing the different culture aspects between the developed and developing countries, Hofstede's cultural dimensions [1] provide proper guidance in analysing both cultures. The following dimensions of Hofstede will be used to describe the two cultures so as to clarify the motivating factors in using SC in each culture:

❖ **Individualism/Collectivism Index:** In his study about culture and SC, Musings (2007) summarized that the collectivism countries use SC tools more than do developed countries. This result seems consistent with Hofstede's cultural dimensions index. To clarify more on the collectivism dimension, the following points summarize its theme characteristics, which justify Musings' (2007) reported result:

- **People from the collectivism culture enjoy feelings of involvement in, and contribution to, the lives of others.**
- They like the sharing of material benefits.
- And they like the sharing of non-material resources.
- They accept the opinions and views of others.
- They are always concerned about the effects of the actions or decisions on others.
- They are concerned about self-presentation and loss of face

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- They believe in the correspondence of their own outcomes with the outcomes of others.

On the other hand, individualism encompasses:

- personal independence
- competition
- emphasis on internal attributes rather than on other people's opinions and indications
- introspection
- personal achievement and success
- uniqueness

Developing countries that are classified as more collectivist than individualistic are likely to use SC tools more than do developed countries that are classified as more individualist than collectivist from a cultural standpoint. Musings (2007) mentions that, in some other studies by Kemp et al (2006), Germany and France were noticed as adopting SC at relatively lower rates than did countries from Latin America and India who were classified as collectivist per Hofstede's dimensions.

❖ **Power-Distance Index:** Musings (2007) notes that a greater increase in power-distance leads to more decrease in using SC, especially the social networking services. Between the developing countries, those countries that have lower power distance are using SC more than those with high power distance. Developed countries show similar effects regarding the power distance factor.

These results show that the usage of SC is more prevalent in developing countries, which focus on group interaction and on sharing with lower-level individuals in personal independence.

The Gulf countries are classified by Hofstede as possessing a collectivism culture with lower power distance. This increases the optimism of smoothly deploying SC there with a high level of acceptance.

3.7.1 Impact of Cultural differences on using SC

Sanchez and Gunawardena (1998) explain that there is a connection between cultural background, learning styles, and cognitive processing. They compare Western and non-

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Western world views and their effects on learning. Western world views include competition, individuality, timing and scheduling, dualistic thinking, nuclear family, superiority of their world view, separation of religion from culture, and task orientation. In comparison, non-Western world views include cooperation, collectivity, relativity of time, holistic thinking, extended family, religion as a part of culture, acceptance of other cultures, and social orientation. Western learning style is characterized by field independent and analytical thinking compared with non-Western leaning style. The authors note these non-Western world views may also be shared by many Euro-American females and minority groups Western countries.

So, there are some researchers who believe that social learning corresponds better with the tendencies of some cultures more than others (Venter, 2003 and Anakwe et al., 1999). For example, Anakwe and colleagues (1999) in their study of 424 students from northwestern U.S. universities found that collectivistic cultural orientation is more consistent with socialization compared with individualistic cultural orientation. They explained that “socialization while using technology can evoke different meanings and reactions among individuals with different cultural orientations”. This is due to different cultural orientations towards independence and self-reliance. These findings represent important considerations that should be considered before implementing social technologies in education.

3.8 Summary of the chapter

As shown in the previous sections, SC tools represent the new building blocks for learning. They help learners to customize their learning styles and consequently enrich their self-directed learning skills, which results in promoting their learning with higher levels of individual performance and academic achievements. They open new channels for knowledge distribution and knowledge management. SC tools give rise to the research methods, as they allow students to be more realistic and to build bridges among their theoretical studies and professional experience.

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Several SC tools were presented to give more flexibility to the educators in choosing the proper tools that fit their learning objectives and are suitable for their learners' experience as well as to offer distributed forms of knowledge acquisition and to provide learners with more opportunities to engage in learning as well. These tools have the potential of increasing collaboration between learners and educators, and added to that, these tools increase the learners' motivation, participation and communication skills.

SC supports the pedagogical innovation in many ways. This includes:

- Enhancing the collaboration and networking skills of the learners and supporting them to mutually one another in their creative potential.
- The potential to enhance the educators' teaching methods by supporting them with new didactics that put the learner in the centre of the learning process.
- SC encourages learners to become self-directed and to promote their social skills, which enables them to interact, communicate and collaborate with a variety of people from different environments.
- SC has a low barrier to entry, which enables learners to participate easily and to promote meta-cognition, which consequently enables them to take care of their learning processes.

On the other hand, SC supports organisational innovation. With SC, the academic institution becomes transparent to its wider community; thus, it becomes easier to involve third parties, such as experts and parents. Thus, it enhances communication among all participants, transcends borders to increase collaboration between organisations, cultures and countries, and integrates the institution with the outer society.

The last part of this chapter includes a summarized review of the literature on the relation between culture and SC. The available research on SC and culture proved that the usage of SC is flourishing in developing countries (including the Gulf States, which classified by Hofstede as developing countries).

Chapter 4

Theories and Models of
Technology Acceptance

4.1 Introduction

This chapter introduces nine of the known models of user acceptance of technology. It forms the foundation for ensuring user acceptance of using SC in HE. The following models were developed over the last few decades in several different fields of research. The Theory of Reasoned Action (TRA) comes from the field of psychology and was developed and validated by Ajzen and Fishbein in 1980. Later, Ajzen (1985) extended the principles of the TRA to create a newer model called the Theory of Planned Behaviour (TPB). Taylor and Todd (1995) later extended the TRA yet again to create the Decomposed Theory of Planned Behaviour (DTPB). The field of information systems contributed with the Technology Acceptance Model (TAM) by Davis (1986) as another extension of the TRA. TAM, in turn, has itself been extended to TAM2 by Venkatesh and Davis (2000). Rogers (1983) developed an independent model, the Diffusion of Innovations (DOI), as did Bandura (1989) with his Social Cognitive Theory (SCT), Deci & Ryan (1985) with their Motivational Model (MM) and Triadis (1997) with the Model of PC Utilization (MPCU).

These models include a range of factors that affect the acceptance of the use of technology. These factors sometimes differ between the various models, so over years some researchers have had to incorporate more than one model into their studies in order to compare factors that did not exist in a single model. This prompted Venkatesh et al (2003) to search for a unified model to combine the various factors. The result of this inquiry was the Unified Theory of Acceptance and Use of Technology (UTAUT), which summarizes the most effective use-factors and develops a group of constructs that cover all of the introduced factors in the previous models.

Though each of these models has its own unique perspective on user acceptance, there is some commonality among all of them. The following sections introduce each of the nine theories in order to identify the most effective way of discussing the factors that determine the use of SC technologies in HE. Subsequent chapters will use this theoretical foundation as a guide to ensure user acceptance of SC in HE in the Gulf States.

4.2 The Theory of Reasoned Action (TRA)

The Theory of Reasoned Action (TRA) is the by-product of an evolution of theoretical models. These models developed as the school of thought concerning the TRA. This was made possible through the integration of known theories on learning, expectancy, attribution, and cognitive dissonance.

This integration was performed through a process of correlation using a bifocal perspective. Ajzen and Fishbein (1980) interpret human behaviour from two vantage points. Theoretically, they look at human behaviour from the controlled environment of a laboratory. Then, to get a complete picture, they also look at the same behaviours in context. Their work is only one of the many behavioural models developed from 1918 to 1970.

4.2.1 TRA core assumptions and statements

The two basic premises of the TRA are:

1. Using their faculties of reason, individuals make use of available sensory and contextual information when they determine a course of action.
2. Individuals are creatures of consequence who thus take the implications of their actions into consideration before acting in a certain way. (Ajzen & Fishbein, 1980).

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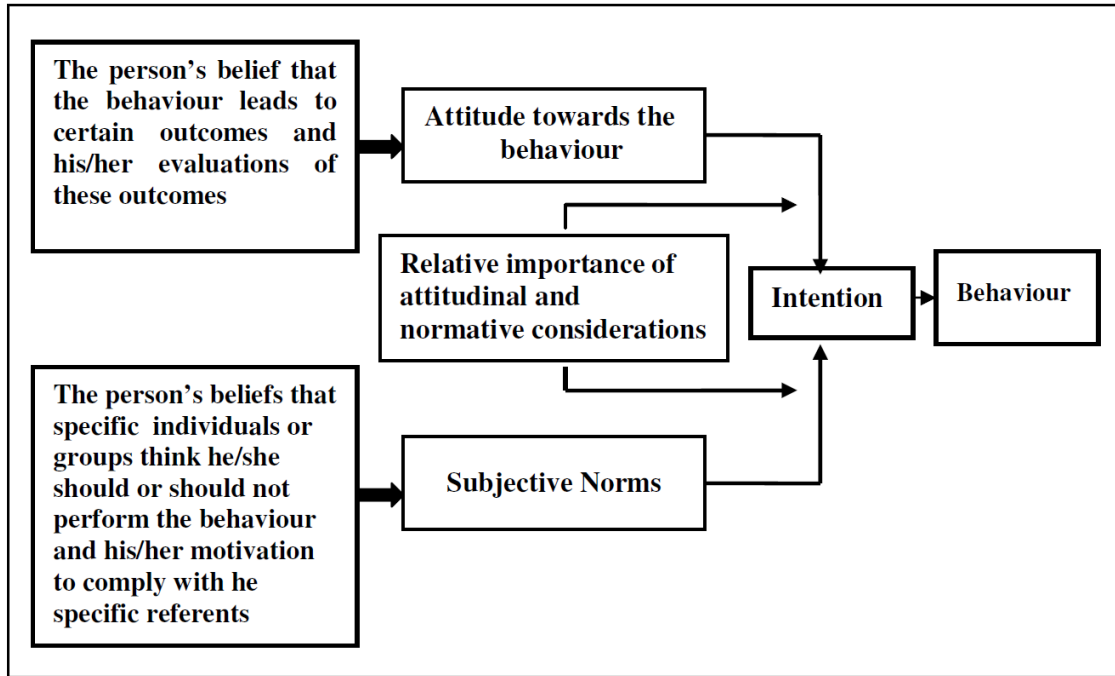


Figure 4-1: Factors determining a person's behaviour

Source: Ajzen and Fishbein (1980, p. 8)

The three main variables defined in the TRA are: attitude towards a behaviour, subjective norms, and intention. These variables together are defined by Ajzen and Fishbein (1980) as the 'attitude towards the Behaviour', which defines the extent to which the performance of a given behaviour can be evaluated as positive or negative.

Attitude. Ajzen and Fishbein (1980) define 'attitude' as a set of beliefs about a certain object or reality. They assume that for a set of beliefs (b_i) weighted by outcome evaluations (e_i), attitude can be expressed by the following equation:

$$\text{Equation 1-2:} \quad A_o = \sum_{i=1}^n b_i e_i$$

Where

A_o Represents the attitude towards some object "o"

b_i Represents the belief about "o" [i is the attribute of "o" as the subjective probability]

e_i Represents the evaluation of the attribute related to the belief about the object "o"

n Represents the number of beliefs that individual has or holds about attitude.

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As demonstrated by Ajzen & Fishbein (1980), attitude towards an object or reality can be predicted with a high level of accuracy if the individual's beliefs about that object and the evaluation aspect of these beliefs are known.

An individual's attitude towards using SC tools in HE could then be calculated, assuming that individual had the following beliefs:

1. SC increases student awareness.
2. SC affects privacy negatively.
3. SC promotes learning through collaboration.

Subjective Norms. A subjective norm can be defined as an individual's perception of what the people around him will think if he or she performs a given behaviour. These are heavily influenced by the social environment around an individual. The TRA defines subjective norms as a person's motivation to comply with the expectations of certain individuals or groups from his or her social environment. This definition can be represented by the following equation:

Equation 1-2:
$$SN = \sum_{i=1}^n b_i m_i$$

Where

SN is the Subject Norms

b_i Is the normative belief (one's belief that referent individual(s) or group (s) thinks he/she should/shouldn't perform the behavior)

m_i Is the motivation to comply with referent i

n Is the number of relevant referent

Intention. The antecedent of any behaviour can be called its intention. Intention expresses an individual's readiness to perform certain behaviour. It can be considered as an indicator of his or her willingness to perform it. TRA definitions assert that behavioural intention can be determined by a combination of social and personal factors. Social factors are expressed by normative factors, while personal ones are expressed by attitudinal factors. These two determinants can be represented, as per the TRA, by the following equation:

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$$B \propto I = (A_B)W_1 + (SN)W_2 \text{ ----- (3-2)}$$

Where B	stands for behaviour
I	is the intention to perform behaviour B
A_B	is the attitude towards performing behaviour B
SN	is the subjective norms
W_1	is the empirical determined weight of attitude
W_2	is the empirical determined weight of subjective norms

4.2.2 Limitations of the theory of reasoned action

Ajzen (1985) notes that the TRA is limited by the ‘correspondence’ between an individual’s attitude and his or her intention to perform a specific behaviour. Here ‘correspondence’ refers to the fact that attitude and intention are assumed to go on in the same context and time frame. Sheppard et al (1988) defined ‘correspondence’ similarly. Ajzen (1985) claims that such correspondence helps to predict that behaviour. He also notes that the TRA does not explain irrational decisions or habitual actions. It depends mainly upon the assumption that all behaviour is controlled and rationally considered beforehand. Kholoud (2005) argues that this is the greatest limitation of the TRA.

4.3 The Theory of Planned Behaviour (TPB)

Designed to address the shortcomings of the TRA, the Theory of Planned Behaviour (TPB) was proposed by Ajzen alone. As in the TRA, intention is the central tenet of the TPB.

The TPB makes use of a separate construct called perceived behavioural control (PBC). This component accounts for behaviour that an individual performs but does not perform of his own volition. It is this concern for non-volitional behaviour that is the underlying purpose of the TPB. With the TRA, Ajzen (1985) studies volitional, controlled behaviour. In the TPB, he attempts to create a model that will do the same for behaviour that is beyond volitional control.

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In studying non-volitional behaviour through the TPB in a later research project, Ajzen (1991) found that PBC varies across varying situational landscapes. Hence, the resulting actions based on PBC vary as well.

In a separate study by Armitage & Conner (2001), PBC was shown to facilitate the prediction of behaviour especially when such behaviour is under volitional control. The magnitude of the individual's PBC will translate the behaviour into an action of its own. This illustrates both the direct and the indirect influences of PBC on behaviour.

Similar to the TRA, the TPB lists determinants of behavioural prediction. These are referred to as behavioural antecedents. According to the TPB, attitude, PBC, and prevailing norms are the guideposts of behaviour, and it is through study of these guideposts that behaviour may be predicted. In a 2006 study, Ajzen condensed the above-mentioned antecedents into a series of core principles.

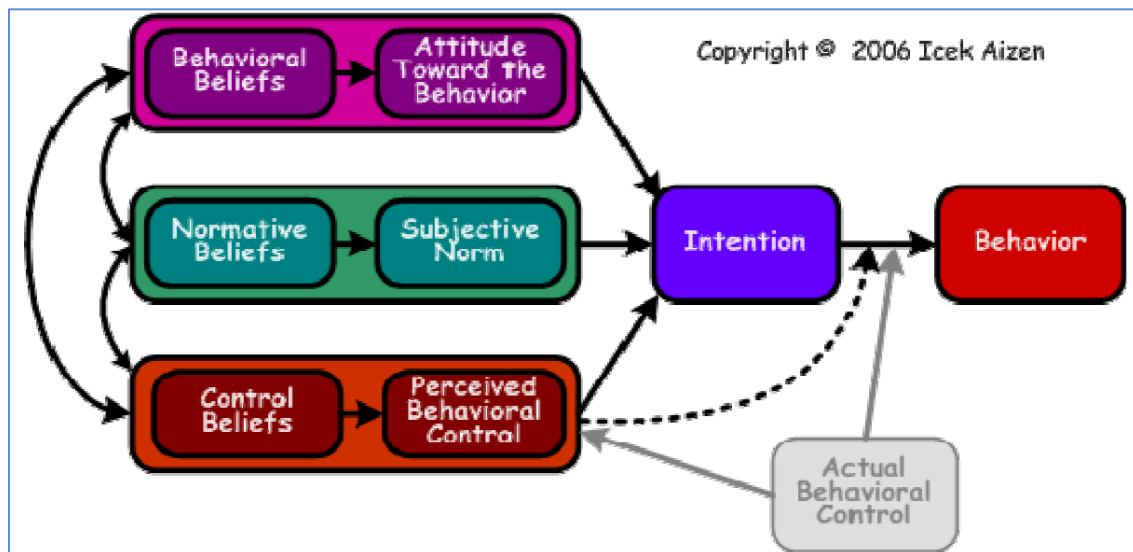


Figure 4-2: Theory of Planned Behaviour (TPB) – Source Ajzen (2006)

Ajzen (2006) summarized these principles as follows:

1. Behavioural beliefs: This principle is rooted in the likelihood that attitude determines the type of outcome that results from a given behaviour.
2. Normative beliefs: Social norms create behavioural expectations in individuals. Prevailing subjective norms are the combination of an individual's beliefs about these expectations and his or her motivation to comply with them.

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3. Control beliefs: Control beliefs are constructs that ultimately hinder behaviour. This construct is the driving force behind behavioural restriction and the framework of the PBC can be viewed as a smorgasbord of belief-controlling factors.

$$PBC = \sum_{i=1}^n C_i P_i \text{ ----- (2-4)}$$

Where *PBC* stands for perceived behavioural control

C stands for control factors

P stands for power of the factor or belief strength.

Up to this point, the TPB has focused on lofty, abstract principles that affect behaviour. The concept of actual behavioural control (ABC) concretizes the abstract principles of the PBC and gives it real-world application. ABC takes empirical realities into consideration and is determined by the extent to which an individual has the skills and requirements to perform certain behaviour.

In psychology, the study of self-efficacious individuals has expanded the importance of PBC as a construct. Confidence in individual capacity is a psychological factor in setting a particular course of action in motion. For Ajzen (1991), self-efficacy and PBC are unified constructs. This was supported by Armitage and Conner in their findings that both PBC and self-efficacy contribute to variance in behaviour.

4.3.1 Limitations of the TPB

Though the TPB was created to resolve the issues of the TRA, it still has its shortcomings. Other studies on the TPB have found other behavioural determinants like habits, moral and social obligations, and the need for identity (Eagle & Chaiken, 1993). The TPB considers both volitional and non-volitional behaviour, but Taylor and Todd (1995) argue that the TPB still fails to account for the different stages in the behavioural thought process. An individual's PBC is not the universal cause of all non-volitional behaviour. To assert that it is, is farcical. The TPB still fails to acknowledge the full breadth of the factors that influence behaviour.

4.4 The Decomposed Theory of Planned Behaviour (DTPB)

Two distinct studies have tackled the TPB and its contents. The works of Taylor and Todd (1995) and Pavlou & Fygenon (2006) each present the Decomposed Theory of Planned Behaviour (DTPB).

4.4.1 Taylor & Todd’s work on DTPB

In order to facilitate improved understanding of the theory, Taylor and Todd (1995a) proposed the decomposition of the TPB and its related constructs. This resulted in the creation of a series of detailed components that serve as extensions to the theory of planned behaviour. In order to provide a more in-depth perspective on the TPB, the DTPB introduced factors in diffusions of innovation (DOI). Figure 4-3 illustrates this.

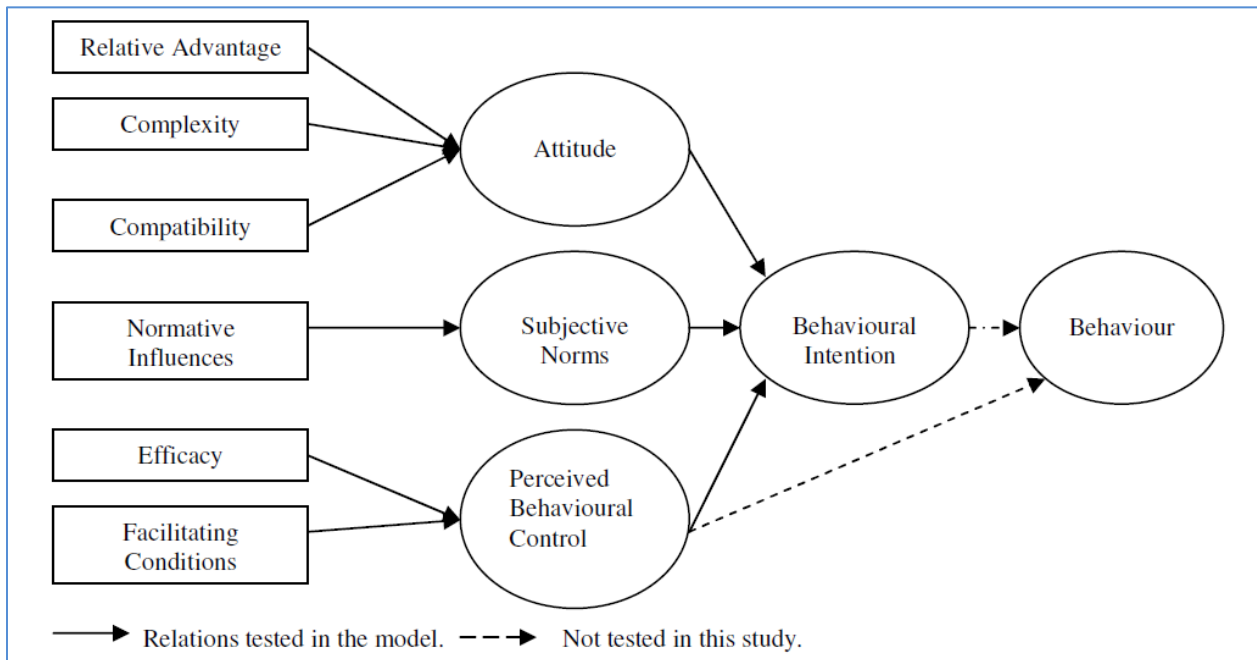


Figure 4-3: Theory of Planned Behaviour with beliefs decomposed

Source Taylor and Todd (1995a)

Taylor and Todd (1995a) assess the aptness of the TRA, the TPB, and the DTPB as theoretical determinants of consumer behaviour. An evaluation of this study shows that the three theories actually differ in purpose. The base theories, the TRA and the TPB, are designed to predict behaviour. The DTPB, however, is better equipped to explain behaviour and its various aspects.

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Taylor and Todd (1995b) also wrote a comparative analysis of the Technology Acceptance Model (TAM), the TPB and the DTPB, wherein they assess the contributions of each theory to IT utilities. Respondents for this study were the users of an online student resource centre.

This study juxtaposes several theoretical concepts. By combining the TAM and DOI theory, Taylor and Todd are able to examine the attitude construct of the TPB. The operation is relatively easy to perform despite its complexity. In addition, their use of Rogerian DOI theory allows the operational definition of constructs to be the same across all the models that they use. Prediction accuracy also varies based on exactly what is being measured. All models are equal in measuring actual behaviour, but the TPB and the DTPB exhibit superior capabilities for the prediction of behavioural intent. Figure 4-4 illustrates the Decomposed Theory of Planned Behaviour.

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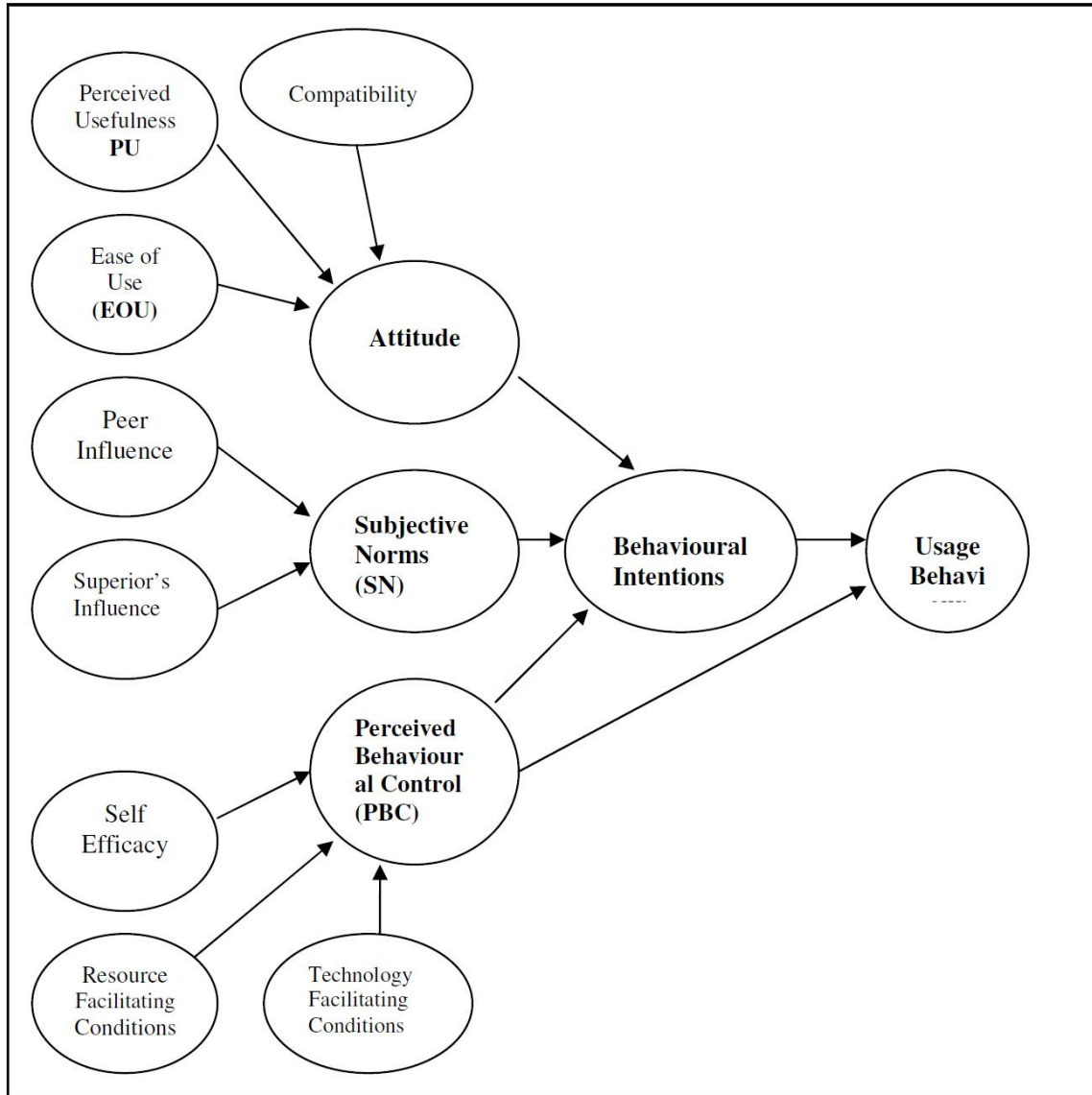


Figure 4-4: Theory of Planned Behaviour decomposed – Source Taylor & Todd (1995b)

Comparing the DTPB and the TAM, however, is not as simple. A detailed understanding of behavioural intent and IT usage is granted by both models. A list of their similarities and differences helps to simplify the comparison:

Similarities. Both the DTPB and the TAM consider attitude. This varies only in the conduction of decomposition by the DTPB. Attitude is also considered to be affected by multiple factors in both models. For the DTPB these are relative advantage, compatibility, and complexity, while the TAM sees attitude as only effected by perceived usefulness and perceived ease of use.

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Differences. This factor of perceived usefulness has a direct effect on behavioural intent in the TAM. In the DTPB, however, behavioural intent is only affected by attitude. The focal points of the two theories are also different. The TAM focuses on design characteristics and usage, while the DTPB model places its emphasis on normative control factors.

4.5 Technology Acceptance Model (TAM)

A study by Davis in 1986 extends the TRA to create the technology acceptance model (TAM). This model was designed to describe and measure acceptance of information technology.

As an extension of the TRA, the TAM alters the prevailing mental framework by introducing two technology acceptance measures in lieu of TRA's attitude beliefs: perceived usefulness (PU) and perceived ease of use (PEOU). The former gauges the extent to which an individual believes that a particular behaviour, product, or system will enhance his or her performance, while the latter refers to the extent to which a particular action is perceived to be effortless. With the above-mentioned factors, TAM eliminates prevailing subjective norms as determinants of behavioural intent. This is shown in figure 4-5 with the attitude construct which was eventually eliminated from the final model. Additional assertions made by the TAM include the logically resulting influence on PU of PEOU, as usefulness and ease of use often go hand in hand.

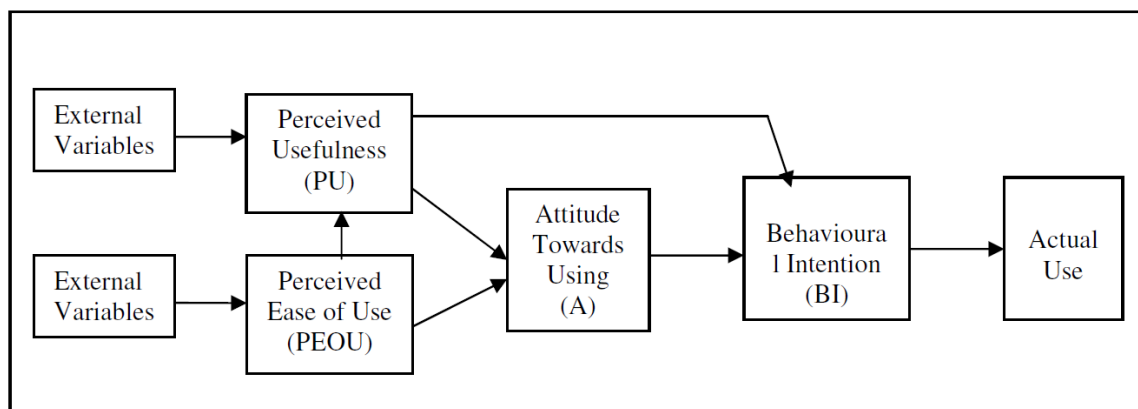


Figure 4-5: Technology Acceptance Model (TAM) Based on Davis et al. (1989)

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Over time, TAM has become a multi-variable theoretical framework. It has been determined that even behavioural determinants within the realm of the theory are affected by external factors. Such factors include system quality, computer anxiety, experience, and computing support.

Another extension to the TAM was proposed by Sun and Zhang (2006) prior to the completion of the TAM 2. They claimed that several moderating factors were needed in the model. These factors were aggregated into three groups: organisational factors, technological factors, and use of technology. Such a model necessitates the use of PU, PEOU, and SN variables in addition to the three overarching groups of moderating variables. The full breadth of the TAM's development is shown in Table 4-1.

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Table 4-1: Summary of selected studies related to TAM

Study	Technology Investigated	Sample	Research objective	Results
Davis 1989	e-mail & file editor ; graphic systems	112 employee 40 evening MBA students	Development of valid measurement scale for PU & PEOU	Two 6 item scales with high reliability for the PU & PEOU.
Davis et al.1989	Word processor	107 MBA students.	Comparing TRA to TAM in predicting intentions to use and the role of attitude in mediating the effect of beliefs on intentions	Both models postulated that BI is the major determinant of usage behaviour. Attitude has no mediating effect between PU or PEOU and BI.
Davis et al. 1992	Word processing program+ Graphic system	200 + 40 MBA Students	Testing enjoyment as a determinant of computer use	Usefulness & enjoyment explained 62% and 75% of variance in usage intentions and were found to mediate the effects on usage intention of PEOU
Adams et al.1992	Voice and e-mail Software applications	118 employees / 10 different organisations 73 users.	Evaluating the psychometric properties of PU&PEOU while examining the relations between PU,PEOU and system Usage	Demonstrated validity and reliability of PU & PEOU measurement. Also, PU is a major determinant of system usage in study 1.
Igbaria et al.1995	Microcomputer usage	236 part-time MBA students	Investigating the impact of the individual, organisational, and system characteristics on usage through beliefs	Confirmed the effect of external variables on usage in addition to confirming previous relations among TAM constructs
Davis & Venkatesh 1996	WordPerfect+ Lotus	182 + 214 + 312 university Students	Testing for any discernible effect on the psychometric properties of TAM's measurement	The 3 experiments showed that TAM measures in the group format best predict and explain user acceptance of IT.
Agrawal & Prasad 1999	Software applications in PC.	230 Technology literate employees	Investigated the role of personal differences with regard to technology acceptance	Validated the relationship between individual differences and technology acceptances mediated by the TAM beliefs.
Venkatesh 2000	Online help system Multi media system Windows 95	70employees 160 employee 52 employees	Determinants of PEOU based n anchoring (self-efficacy, facilitating conditions, computer anxiety, and computer playfulness) and adjustment perspective1 moderated by experience	Anchor elements were used to form PEOU about a new system and with increased experience adjustments play an important role in determining system specific PEOU
Venkatesh & Morris 2000	Data & information retrieval system	246 employees from 5 different organisations	Investigating SN, experience & gender differences in the context of individual adoption & usage of technology at the work place	Women are influenced by PEOU & SN in making their adoption decisions while men consider PU Only.
Wixom & Todd 2005	Data warehouse predefined reporting software.	456 employees from seven organisations from different industries.	The model distinguishes the system based beliefs and attitudes (satisfaction perspective) from behavioural beliefs and attitudes (technology acceptance perspective	Results supported the application of information & system satisfaction as external variables to traditional TAM
Sun & Zhang 2006	Meta-Analysis		Provide a systematic analysis of explanatory and situational limitations of existing technology acceptance studies.	Extending TAM to include 10 moderating factors categorized into three groups: organisational, individual and technological factors.

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¹*Anchors: factors that determine early perceptions about the PEOU of a new system; Adjustments reflect beliefs that are shaped based on direct experience with the target system.*

Perhaps the key element in analytically comparing the TAM to other models is the acknowledgement that TAM was developed in a totally different academic field. The theory, therefore, was born with a different set of limitations: those of the field of information systems. This is starkly different from the TRA and the TPB, which were developed for the field of psychology.

4.5.1 Limitations of TAM

Critics of the TAM often prey on the methodology necessary to be able to generate information for the model to process. Self-reporting is a subjective data collection method and this is acknowledged by those who subscribe to the TAM design. This results in the possibility of inaccurate results.

Yet another limitation of the TAM model is its minimal capacity to influence those it evaluates. It provides useful feedback about an individual's propensity to accept technology, but it does not point out areas that could be addressed to facilitate the adoption of certain forms of technology. These two limitations were summed up by Sun and Zhang (2006) and referred to as limitations in explanatory power and inconsistent relationship amongst constructs, respectively. As a side issue, limitations in representation during the validation phase also raise some doubts about the validity of TAM as a research instrument.

Inconsistencies in the constructs of TAM often result from disharmony in the relationship between PEOU and PU. This relationship is considered significant by many studies. According to Lee (2003), this most likely results from the reliance on a single information system for a study, which yields a cross-sectional research project that does not account for the numerous ways in which TAM data can be manipulated. This is when the use of moderating factors comes into play. TAM2 was created to merge all of these improvements into a single instrument.

4.6 An Extension of the Technology Acceptance Model (TAM2)

The original TAM model was converted by Venkatesh and Davis into the TAM 2 in 2000. The useful, though admittedly limited, TAM model had itself been originally based on Ajzen's TRA. This new extension acknowledges the need for monitoring variables to be added in order to fill in gaps in the two-factor model, and so it adds usage intention as a new determinant.

The TAM2 acknowledges the change in TAM results brought about by familiarity with certain technologies. To address this issue, it introduces an additional determinant to account for changes in an individual's perception of a given technology as he or she gains experience with it. This is illustrated in Figure 4-6.

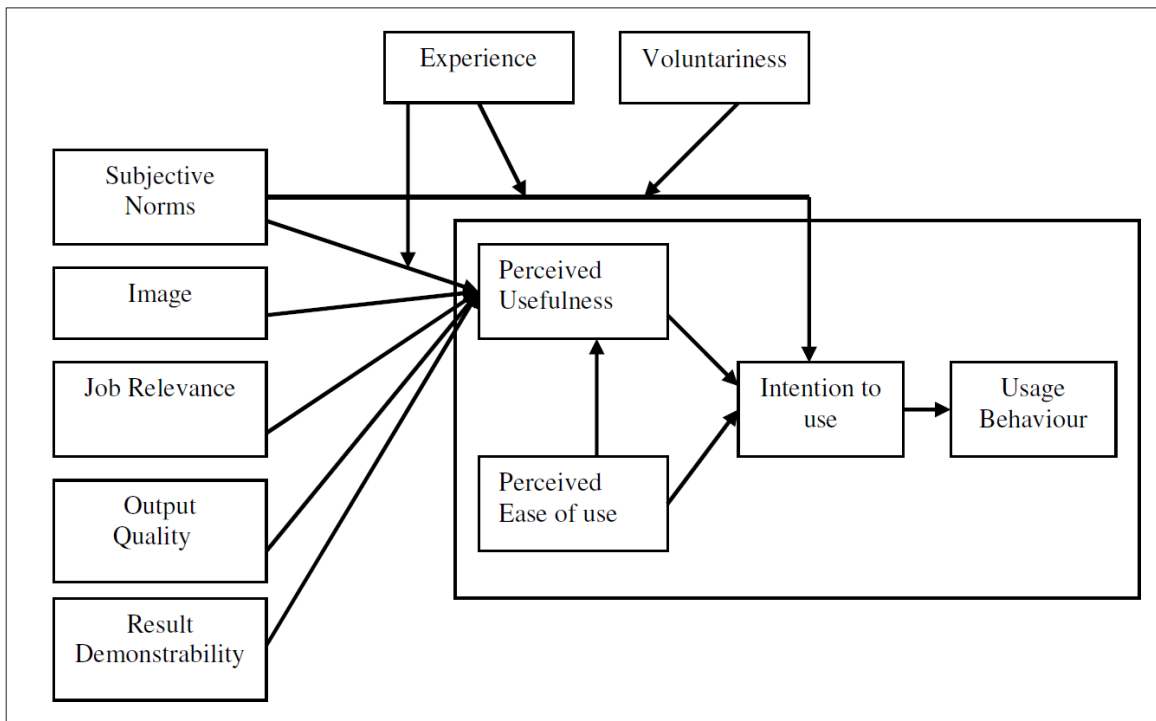


Figure 4-6: TAM2—Extension of the Technology Acceptance Model

Venkatesh and Davis also elaborate on the part that social and environmental influences play in computer usage. The core of this idea lies in the nature of technology within an organisational setting. This addition essentially affirms that usage intention plays a significant role in the adoption of the information system, PU, or PEOU.

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Prevailing social norms are also crucial as determinants of behaviour in the TAM2 model. This is because of the incorporation of the process of collective identification. It is considerably easier for an individual to adapt to the use of a given piece of technology if the people around him or her believe that he or she should do so. The influence of this factor, however, weakens over time. As users gain experience with a given technology, the need for outside influences decreases as he or she becomes more self-efficacious.

Yet another new aspect of the TAM2 is the cognitive instrumental process. Simply put, this idea incorporates the fact that individuals who use technology often see it as a stepping-stone to success at work. The extent to which an individual's job goals and the outcomes of using technology match becomes a crucial determinant of behaviour. The PU of the system does not decrease over time with gained experience if the system continues to be useful.

TAM2 is applicable across a variety of disciplines as it evaluates the thought-process of the subject. Chismar and Wiley-Patton use TAM2 in their study to analyse the extent to which 89 paediatric physicians accept the use of the internet and internet-linked applications. In this case, PU takes precedence over PEOU. The nature of a physician's job requires easy access to information, and hence PU here is exceedingly high. While PEOU is not the main determinant of the choice to adopt the new technology, a physician's educational background does afford him a high degree of competence in understanding technologies. This illustrates how TAM2 goes beyond the standard two-factor model to accommodate external factors.

4.7 The Diffusion of Innovation Theory (DOI)

Members of any social system communicate using innovations of technology, and this diffusion of innovative technologies is essential if a society is to develop. Anything considered new, either being a practice or an object, is to be considered potential innovation. These innovative ideas are spread through communication via channels which facilitate their diffusion.

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Innovative technologies face the same challenges as anything else that is considered new: risk and doubt. Innovators strive to dispel notions of risk and shadows of doubt by engaging in a process of information dissemination known as diffusion. This process is subdivided into four elements: innovative technology, communication channels, time, and the social system in which the other four elements can exist.

4.7.1 Description of the DOI theory

Diffusion theory creates a conceptual paradigm that considers diffusion as a process that is integral to social development and change. Juxtaposed with innovation theory, diffusion paves the way for the development of science and technology in a society. More importantly, it also serves as a trailblazer for technology usage and the change of prevailing techno-social norms. DOI theory creates a means for evaluating the rate of the diffusion of technology within a social environment.

4.7.2 Innovation decision process

The point from which the DOI starts is the moment when an individual obtains first-hand knowledge of a technology. This begins a process of attitude development within the individual until he or she reaches a point of adoption or rejection of the practice or object. This process ends with the implementation of a new idea and the confirmation of the decision that has been made. The elements of this process are discussed in greater detail below:

- i. **Knowledge.** This phase is marked by the first exposure of an individual to the existence of a new object or practice. Such knowledge is further subdivided into different types:
 1. Awareness-knowledge: The first step to obtaining knowledge is knowing that it exists. The practice of seeking out innovation stems from the notion of possibility. Awareness knowledge is rooted in potential.

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2. **How-to-knowledge:** This type of knowledge is utilitarian in nature and involves the search for knowledge in order to maximize innovation as use is adopted.
3. **Principles-knowledge:** This type of knowledge is by far the most complex. It deals with in-depth knowledge of how innovation works. This is essential for further innovative development. Those who actually immerse themselves in the DOI process generally possess a solid understanding of its principles.

Rogerian theory argues that it is possible to adopt innovation even given a lack of knowledge regarding its principles, but such adoption exposes the user to the threat of misusing an idea or not maximizing its effectiveness.

- ii. **Persuasion.** The psychological reduction of an individual's uncertainties about new ideas via his or her encouragement to seek credible information that will allow him or her to develop a favourable attitude towards innovation. Rogers argues that persuasion can be reflected in changes, either favourable or unfavourable, in the overt behaviour of a person towards innovation.
- iii. **Decision.** The cognitive process of either adopting or rejecting the idea of innovation. According to Rogers, it is still possible for rejection to take place even after a prior adoption.
- iv. **Implementation.** The phase in which an individual decides to live out the changes accompanied by *innovation* without giving consideration to the possible problems that may arise from its application. Rogers (2013) further states that reinventions of original ideas allow flexibility and discretion to mitigate problems.
- v. **Confirmation.** A reckoning point where the individual re-evaluates his decision to adopt the innovation to *avoid* inconsistencies. If the individual does not reaffirm his prior acceptance, he or she either adopts a new, better idea called a replacement discontinuance or he or she undergoes a total rejection of the original idea of innovation called a disenchantment discontinuance (Rogers, 2003). Rogers

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discusses the possibility that the start and end of the different innovation-decision stages may overlap depending on the time needed by each individual, so exact distinction for each is not necessary.

4.7.3 Research applying DOI theory

Numerous studies on innovation integrate the attributes of innovation as determined by Rogers. Tornatzy and Klein (1982), for example, review the characteristics of innovation using a meta-analysis.

Moore and Benbasat (1991) expand upon Rogers's findings by adding two more attributes—'voluntariness of use' and 'image'—to the perceived characteristics of innovation (PCI). The most notable achievement of their study is the development of a 34-item instrument that applies DOI theory to determine how the perceptions of individuals relate to their actual use of technology and other products of innovation. Figure 4-7 illustrated the seven scales in Moore and Benbasat's study (1991).

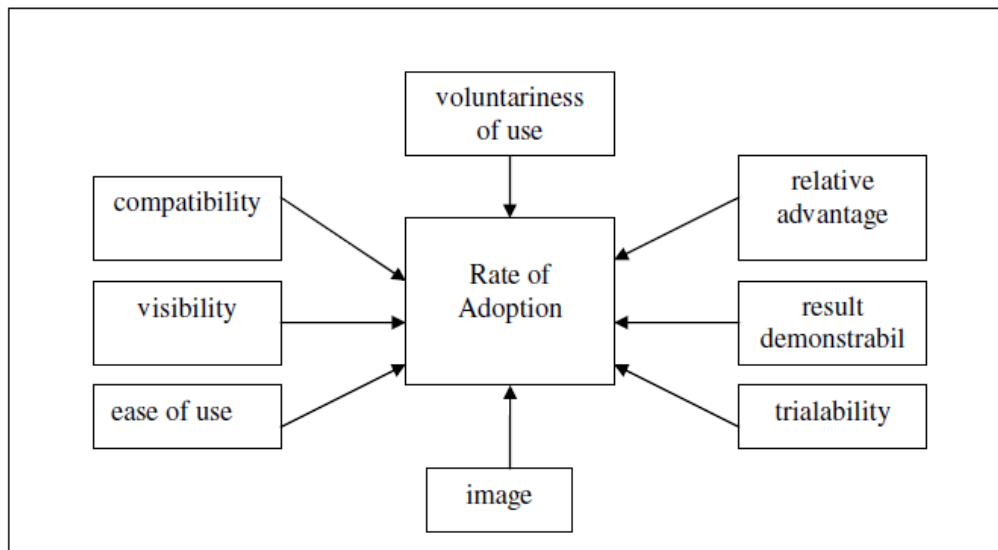


Figure 4-7: The seven scales in Moore and Benbasat's study (1991)

4.8 Social Cognitive Theory (SCT)

Social cognitive theory (SCT) is a theory of learning that presents cognitive variables that mediate between stimuli and responses to prove that individuals have control over their behaviour. Common tenets to all the different models of social learning theories are:

1. An individual's behaviour can be stimulated by either reward or punishment.
2. In addition to learning through actual participation, man acquires knowledge and skills by visual, vicarious learning.
3. An individual's behaviour can be shaped by the imitation of people that he or she is associated with.

Albert Bandura has an authority on the cognitive Social Learning Theory (SLT) development in general and, more particularly, on the notion of modelling that is also known as the vicarious learning model. He has also contributed significantly to social learning concepts like self-efficacy, reciprocal determinants, and the idea of temporal variation in cause and effect through lapse of time. From his analysis of Miller and Dollard's *Social Learning and Imitation*, he determined that there are four cognitive sub-functions that affect SLT: attention, representation, enactive translation, and motivation.

4.8.1 Conceptual components of SCT

SCT covers a comprehensive set of key factors, some examples of which follow.

Reciprocal determinism. As shown in the Figure 4-8, there is a triadic and mutual relationship among behaviour, environmental factors, and personal factors.

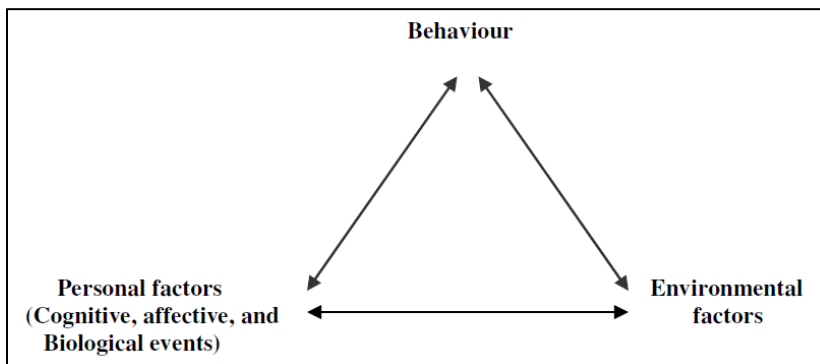


Figure 4-8: The relationship among behaviour, environmental factors, and personal factors

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The dynamic relationship among these three factors leads to inequality in their levels of influence that is dependent on individual circumstances like social and physical environmental influences (Pajares, 2002).

Vicarious capacity. This is the idea that humans are capable of learning through visual observation of others without needing to actually enact the ideas. Actual performance is not a requirement, as people do not transform all of their ideas into actions (Bandura, 1989).

Forethought. The capacity for forethought allows individuals to motivate themselves and to guide their actions based on outcomes that they anticipate.

Self-regulatory capability. This is the idea that people are capable of self-regulation of their behaviour that is influenced by social and moral standards as well as by self-produced goals and motivations.

Self-reflective capability. Self-reflection is a unique characteristic of humans as rational beings, in that it is a product of the critical analysis of thoughts and experiences. Other factors that may influence an individual's standards for evaluating his or her own thoughts and actions are self-experiences, vicarious observations, social persuasions, and the appraisal of his or her own strengths and weaknesses.

Self-efficacy. Bandura (1986) defines self-efficacy as a person's judgments of his or her own capability to execute an action plan. These judgments are not really concerned with skills, but the judgments themselves affect how a person maximises the skills that he or she does possess. An individual will act and execute performance based on this belief unless a supervening or qualifying element changes the circumstances and demands reassessment.

4.8.2 Self-efficacy and computing

The validity of self-efficacy has been studied together with the IS/IT domain-related factors to interpret the acceptance or adoption of wide-ranging technologies of individuals. Among the notable researchers are Compeau and Higgins (1995a), who

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studied the validity of the self-efficacy of computers together with its impact and antecedents. They concluded that computer self-efficacy (CSE) is a judgment of one's ability to manipulate the computer, measured by several dimensions of self-efficacy, including "Magnitude", "Confidence level" and "Generalisability".

Magnitude reflects the expected level of capability. A high magnitude of CSE is a sign that an individual believes that he/she is capable of accomplishing computing-related tasks almost without the need for supervision or assistance.

Confidence is one's competence in the performance of multiple computing tasks indicates strong CSE. Generalisability refers to the extent to which one's CSE applies to different activities involving software or hardware configurations. The degree of generalisability is directly proportional to the expected level of ability in doing various systems computer tasks.

Compeau and Higgins (1995b) developed a research model based on the social cognitive theory known as the modelling intervention. In this model, prior performance and behaviour modelling are correlated directly to CSE, outcome expectations, and performance. The study tested the modelling intervention by showing a 20-minute videotape of educational clips on the use of the computer in different variations to eight research groups. Figure 4-9 shows the modelling behaviour as per SCT.

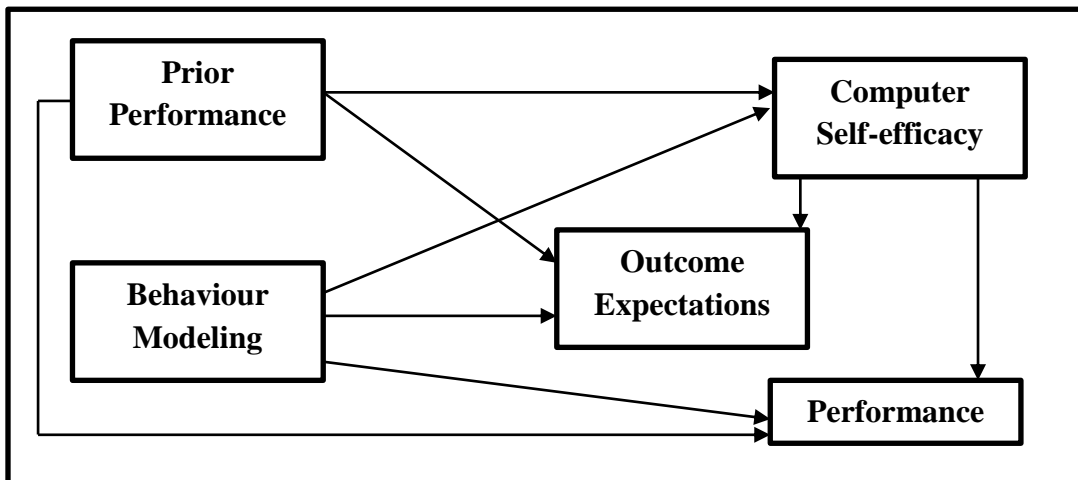


Figure 4-9: SCT modelling behaviour.

Source: Compeau and Higgins (1995b).

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The CSE formulation by Marakas et al. (1998) was used by Johnson and Marakas (2000) in their proposed model, which is a replication of the behaviour modelling effect on performance from Compeau and Higgins' (1995b) study. Johnson and Marakas (2000) also expanded the study of Compeau and Higgins (1995b) with their theoretical explanations as to the issues left unanswered by the latter through presenting a modified model that can accurately reflect both SCT and the relevance of interest. Figure 4-10 illustrates the modified model by Johnson and Marakas (2000).

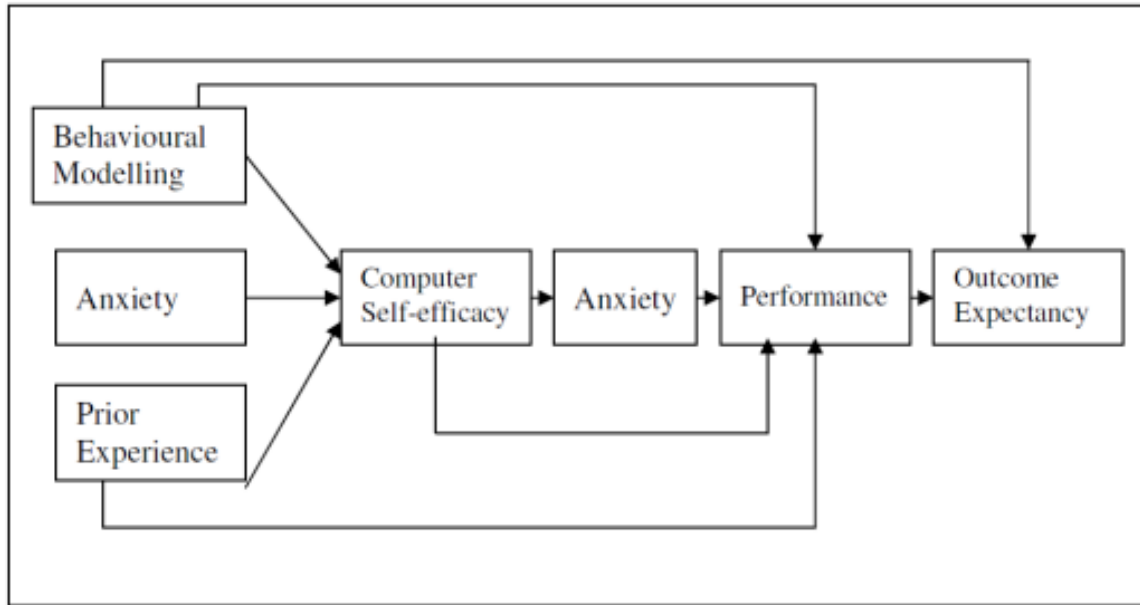


Figure 4-10: The proposed model (derived from Marakas et al. [1998]).

Source: Johnson and Marakas (2000).

Comparing the two models, the Marakas et al. (1998) measures were more effective at capturing changes in the levels of CSE throughout the experiment because the revised model was able to capture the relationship of prior experience with the effect of mastery. Furthermore, the Compeau and Higgins (1995b) analysis was able to predict the behaviour response as influenced by modelling training with the assertion that it is more able to capture changes in CSE due to vicarious experience.

Using the foundations laid down by Marakas et al. (1998) on GCSE and CSE, Agarwal et al. (2000) scrutinised the development of self-efficacy beliefs over time through a software training environment study that included social influences,

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demographic variables (such as computer experience and prior performance) and beliefs related to self-perception of ability. Figure 4-11 illustrates the research model.

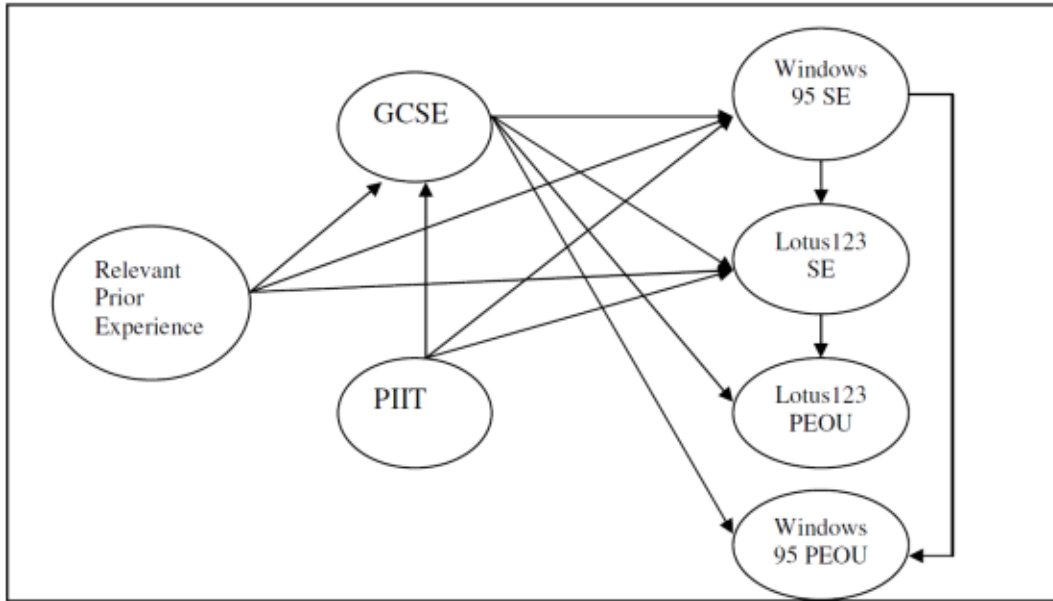


Figure 4-11: Research model of Agarwal et al.'s study.

Source: Agarwal et al. (2000).

4.9 The Motivational Model (MM)

The Motivational Model (MM) is discussed and presented in ties with Davis's self-determination theory (SDT). SDT was originally created by Deci and Ryan in 1985. This is one of the multitudes of theories brought forth by motivation research. This particular theory espouses the view that the experience of choosing involves an understanding of the phenomenology of self-determination as a human quality. SDT sets apart two forms of behavioural regulation and dichotomises into two classifications: self-determined and controlled. These regulators are founded on several innate human needs, which are enumerated below:

1. **Competence** involves a keen understanding of the process by which external and internal outcomes are achieved as well as an individual's perceived efficaciousness.
2. **Relatedness** involves the utilisation and augmentation of one's connection with the external environment.

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3. *Autonomy* (or self-government) involves the individual's capacity for self-regulation of behaviour.

It is imperative that such needs be met in order that an individual may feel motivated. A special consideration is given to the need for autonomy, because in order for this to be met successfully, the person should have adequate capacity for self-determination instead of being controlled. These motivators are once again divided into two subgroups: extrinsically motivated behaviour and intrinsically motivated behaviour.

Behaviour that is intrinsically motivated is an act performed with no motivational factors apart from harmony with an individual's value set. Extrinsically motivated behaviour, on the other hand, is done as a means to achieve an end or for a certain consideration. Extrinsic motivators, which follow a self-determination continuum, are **external, introjected, identified, and integrated** forms of regulation. These types of regulation all involve the adoption of a value, which in turn leads to a specific behaviour. This falls in the realm of self-determined action.

Self-determination theory (SDT) proposes that psychological needs and the social environment will determine one of many potential motivations. Each different motivation can have varied effects on our thoughts, behaviours, and feelings. These motivations are believed to fall along a single continuum and are all connected with each other (Deci & Ryan, 1985). According to SDT, Amotivation is the first and lowest category on the continuum; the next category is extrinsic, and the last is intrinsic, which is considered the ideal motivation as one is said to be operating in a self-determined fashion, or internally centred (Ryan & Deci, 2002). Figure 4-12 shows the type of motivation styles as indicated by SDT.

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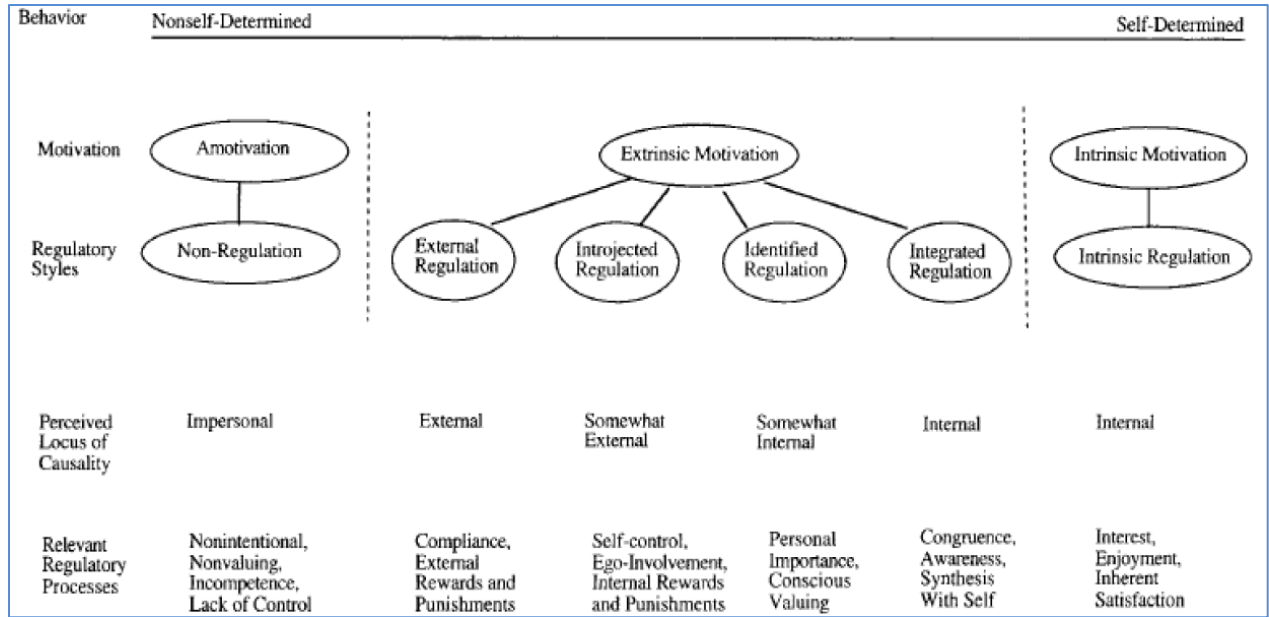


Figure 4-12: Self-determination continuum.

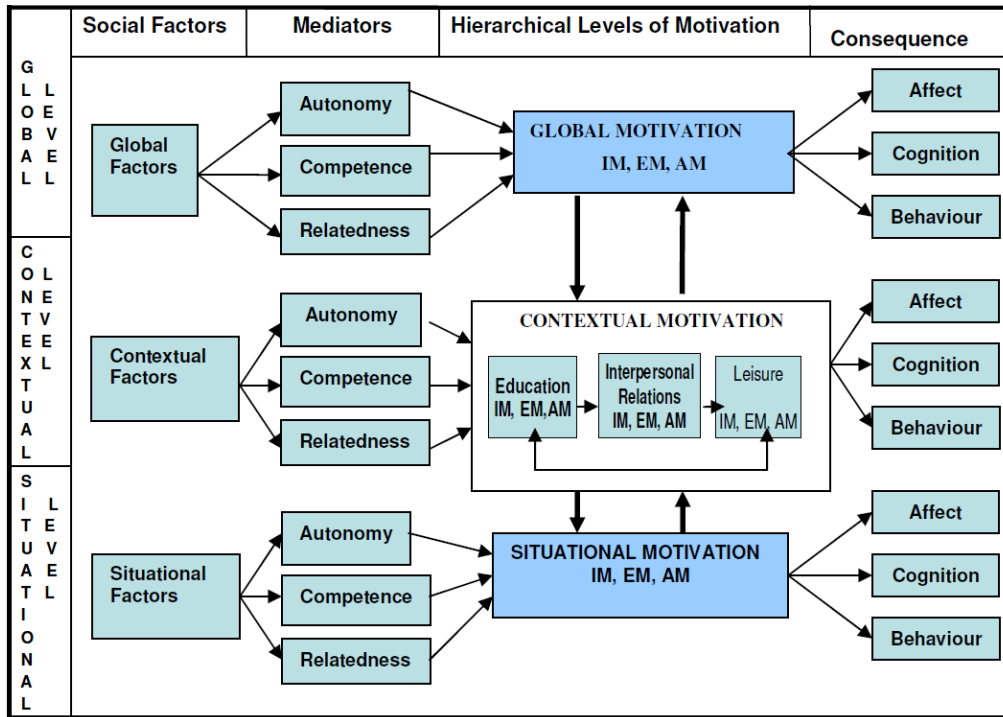
Source: Ryan and Deci (2000).

In 2000, Vallerand expanded SDT into the hierarchical model of motivation. This model defined motivation along the same SDT continuum, but posited that motivation operated at three levels. These were the global (personal) level, the contextual (domain) level, and the situational (state) level.

Vallerand (2000), in a comparison between Deci and Ryan's (2000) SDT and his hierarchical model of motivation, acknowledged a large degree of agreement between the two. Figure 4-13 illustrates the hierarchical model of intrinsic and extrinsic motivation for Vallerand (2000). However, he underscored some areas in which the two models differ:

- the importance of a hierarchical structure of the motivation process,
- the role of psychological needs in the motivational sequence,
- individual differences in needs, and
- the different role of the need for relatedness. (Vallerand, 2000)

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IM=Intrinsic Motivation, EM=Extrinsic Motivation, AM=Amotivation

Figure 4-13: The hierarchical model of intrinsic and extrinsic motivation.

Source: Vallerand (2000).

The motivational model posits that motivation must be considered from multidimensional perspectives. Vallerand (2000) proposed five postulates that are vital to the hierarchical model. The first indicates that all three motivations (IM, EM, and AM), which play a critical role in an individual’s psychological processes, should be examined when measuring motivation. The second postulate states that these motivations (IM, EM, and AM) exist in each individual at the global, contextual, and situational levels. The third postulate states that motivation at any level results from two sources—social factors and environmental conditions—and the motivation transferred between levels. In other words, global motivation can affect contextual motivation, which can influence situational motivation. Vallerand (2000) also assumes that the impact of social factors is mediated at each level by perceptions of competence, autonomy, and relatedness. The fourth postulate indicates that there is a recursive effect specifically from a lower level to the level above. The final postulate states that motivation leads to important behavioural, cognitive, and affective consequences (Vallerand, 2000).

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4.9.1 The motivational model and technology acceptance

Several issues have been addressed by the SDT beyond the concerns of extrinsic and intrinsic motivations. These issues include:

1. the processes of self-determination of non-intrinsically motivated behaviour and
2. the agents of influence of the social environment on such social processes.

Having addressed these issues, the SDT has established the guideposts for regulated behaviour and lack of motivation. The latter ensues when there is dissonance between behaviours and intended outcomes. This also occurs when learned helplessness sets in through a feeling of lack of control and utter incompetence.

Lack of motivation is not intrinsically or extrinsically motivated, per se. This is why SDT postulates that psychological needs and social environment are equally powerful determinants of behaviour. Figure 4-12 shows the motivation styles indicated by the SDT.

Through years, SDT has evolved into several sub-theories, such as the cognitive evaluation theory (CET), organismic integration theory (OIT), causality orientation theory (COT), and the basic needs theory (BNT). All of these sub-theories take social environment and psychological needs as basic tenets of the behavioural adoption process.

Combined with the technological acceptance model as proposed by Davis (1993), the SDT and its sub-theories serve as reliable predictors of behavioural adoption. These theories are also viable options in expounding on the mental processes that govern the adoption of behaviour and innovation. Albeit not necessarily integral to self-determination, an understanding of such mental processes contributes greatly to the behavioural sciences.

Igbaria et al. (1996) integrated and examined the relative influence of the three motivators (perceived usefulness, perceived playfulness or fun, and social pressures) on an individual's decisions to use microcomputers. Their conceptual model was based on the motivational model as illustrated in Figure 4-14.

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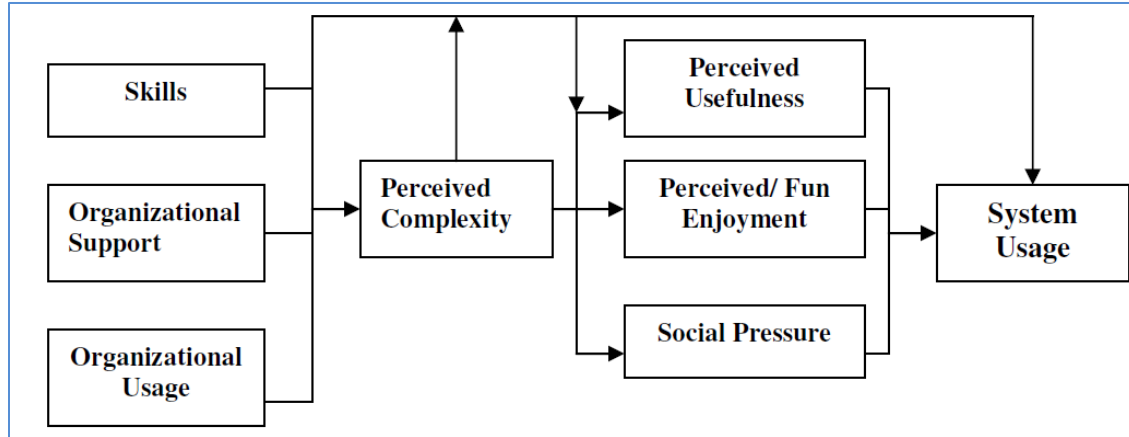


Figure 4-14: The motivational model of microcomputer usage.

Source: Igarria et al. (1996).

The findings confirmed previous results regarding the key motivating role of PU in promoting technology usage (for microcomputers, in this study). The results also indicated the incentive properties of anticipated enjoyment and normative social pressures in stimulating usage. Additionally, results indicated moderate to strong support for the proposed linkages among the model's variables. Perceived complexity was a key intervening variable linking the antecedent variables of skills, organisational support, and usage with perceived usefulness, perceived enjoyment, and social pressure and its direct effect on usage. The authors acknowledged that the model only explained 28% of the variance in usage and that the unexplained 72% suggests the need for additional research to incorporate other potential measures such as self-efficacy, user involvement and participation, and task characteristics.

Venkatesh and Speier (1999), using Davis' (2000) motivational model, investigated the role of positive and negative mood states in the attitude of the employees during the training for a specific computer technology. Looking at Valler's (2000) hierarchy model, there are other factors that must be considered such as the social environment and individual circumstances. According to Venkatesh and Speier (1999), as a general rule, positive mood boosts the individual's motivation to use technology in the accomplishment of tasks. In other words, there is an increase in the intrinsic motivation. On the other hand, negative moods will work to discourage the new users because they will have the mindset that the task is difficult and that they do not have the necessary

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skills and knowledge to accomplish such a demanding task. These inferences on the effects of positive and negative moods were observed during the experiment conducted by the author using a controlled group and videos installed in the offices of the different organisations (Venkatesh & Speier, 1999).

The foundations laid by the previously discussed study enabled Speier and Moris (2002) to conduct a subsequent study which resulted in a new research model that integrated the focal concepts of technology acceptance with the motivational models. Figure 4-15 diagrams this model.

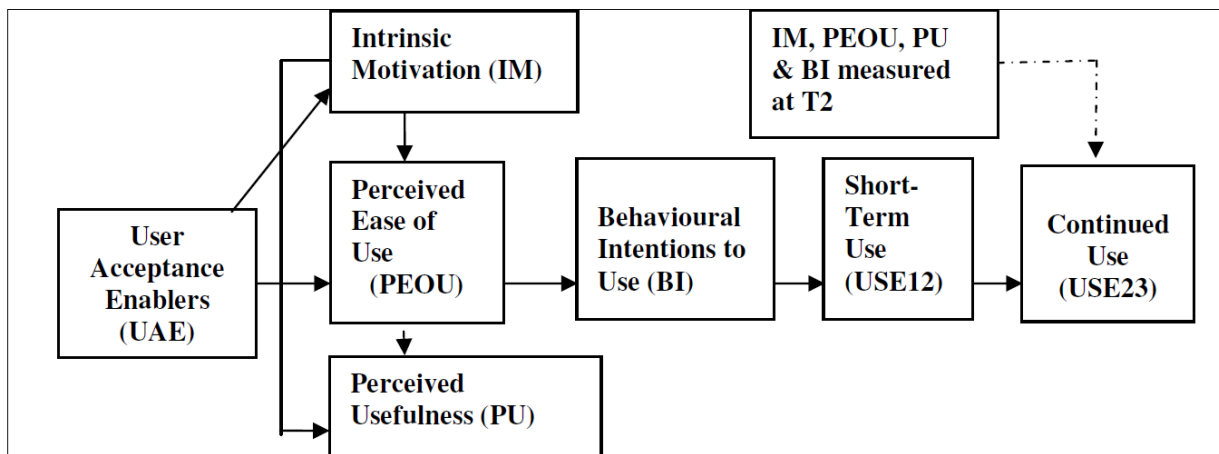


Figure 4-15: The proposed integrated model of technology acceptance and motivation. Source: Venkatesh et al. (2002).

4.10 The Model of PC Utilisation (MPCU)

Triandis (1979) conceptualised a framework to illustrate how behaviour manifests and the factors that instigate them after he observed that there is an absence of coalescence to the different studies on the analogy of attitude, values, and other behavioural tendencies or propensities in both action and attitude. The framework included general variables that make it applicable to any reality or culture, as illustrated in Figure 4-16.

Based on Triandis' framework, only a few of the many consequences of behaviour are perceived by the individuals, including its determinants such as biological stimulants, habits, mindsets, personalities, and environmental influences. Perceived

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consequences were also distinguished from actual consequences, as they attach different values to the behaviour–consequence–reinforcement sequence on the individual (as a part of the system of the person).

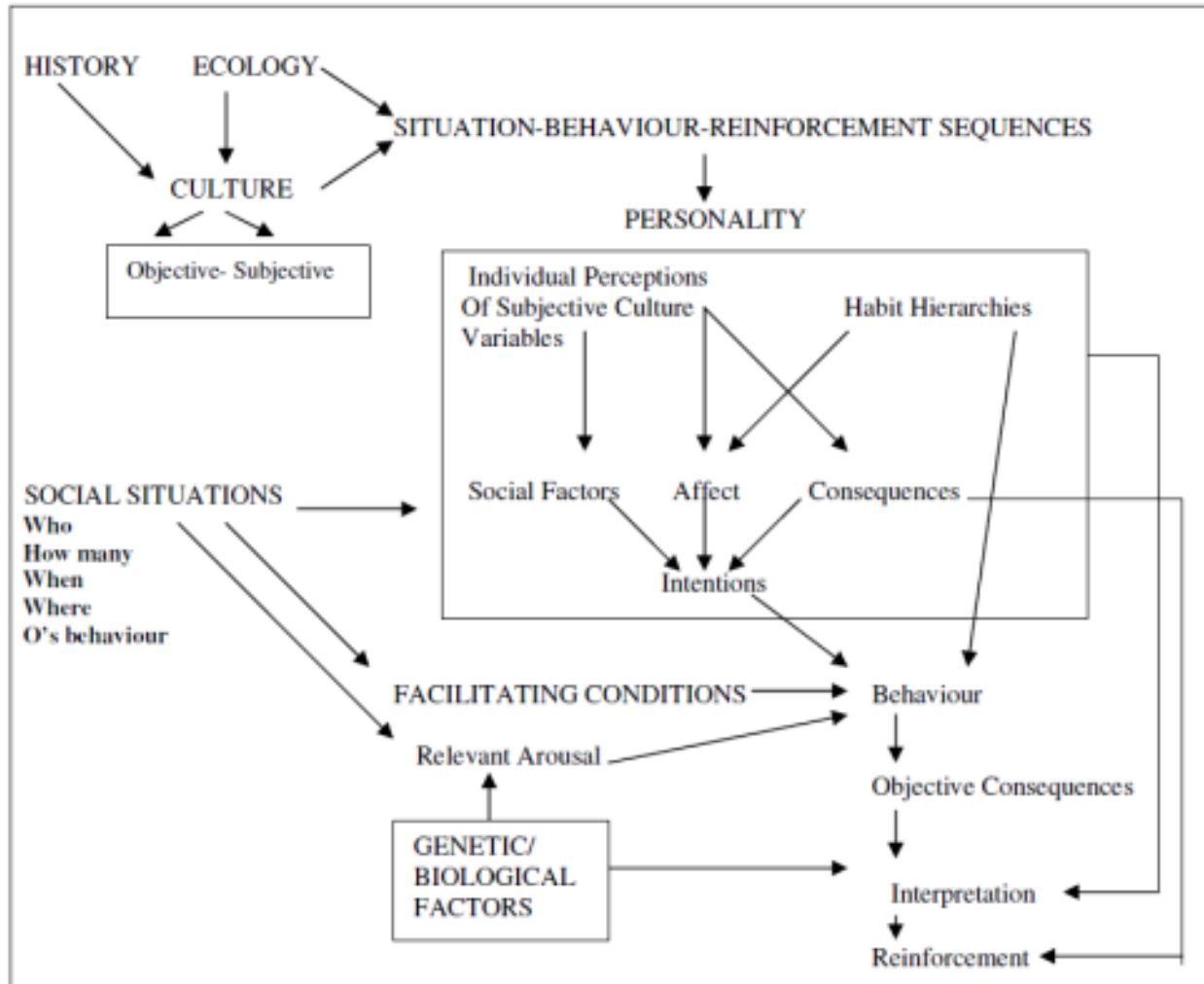


Figure 4-16: Triandis' theoretical framework.

Source: Triandis (1979).

In the framework, different cultural aspects and attributes of ecology culture–society as variables affecting the behaviour and values of an individual were highlighted. Altogether, these variables form part of the bigger picture of factors that affect the individual's attitude towards personal computer (PC) utilisation. To be exact, the breakdown of the two variables includes social norms, expectations, habits,

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intentions, education, access to resources and distribution of the same, and cultural complexities.

Figure 4-17 below illustrates the framework of the study of Thompson et al. (1991, 1994), which shows the direct, indirect, and moderating factors influencing the utilisation of PCs.

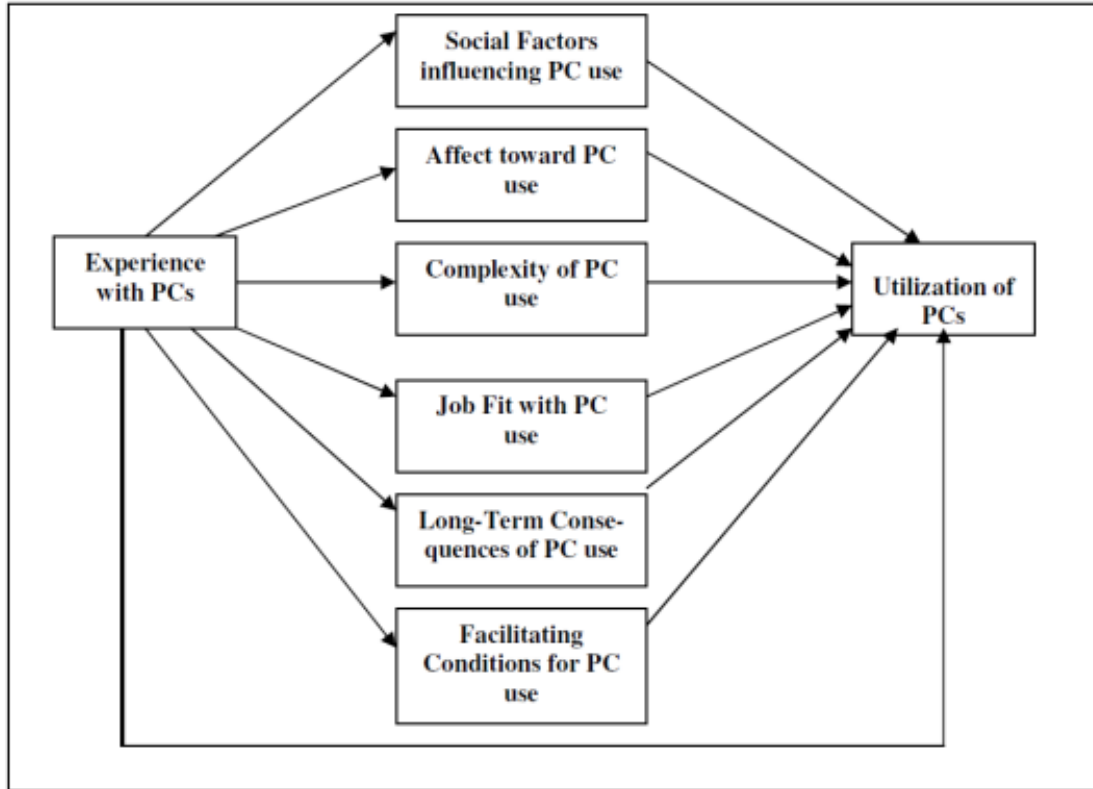


Figure 4-17: Factors influencing the utilisation of PCs.

Source: Thompson et al. (1994).

Another group of theorists (Bergeron et al., 1995) utilised Triandis' framework of value, attitude, and behaviour in explaining the adoption behaviour set forth by the executive information system (EIS). Still, based on Triandis' framework, the study was limited to the six variables of affect, behaviour, Facilitating Conditions (FC), habits, perceived consequences, and social factors in assessing the individual's experience with EIS. At the end of the study, the results showed that internalising the use of EIS is a more suitable determination of behaviour than just considering the frequency of EIS usage.

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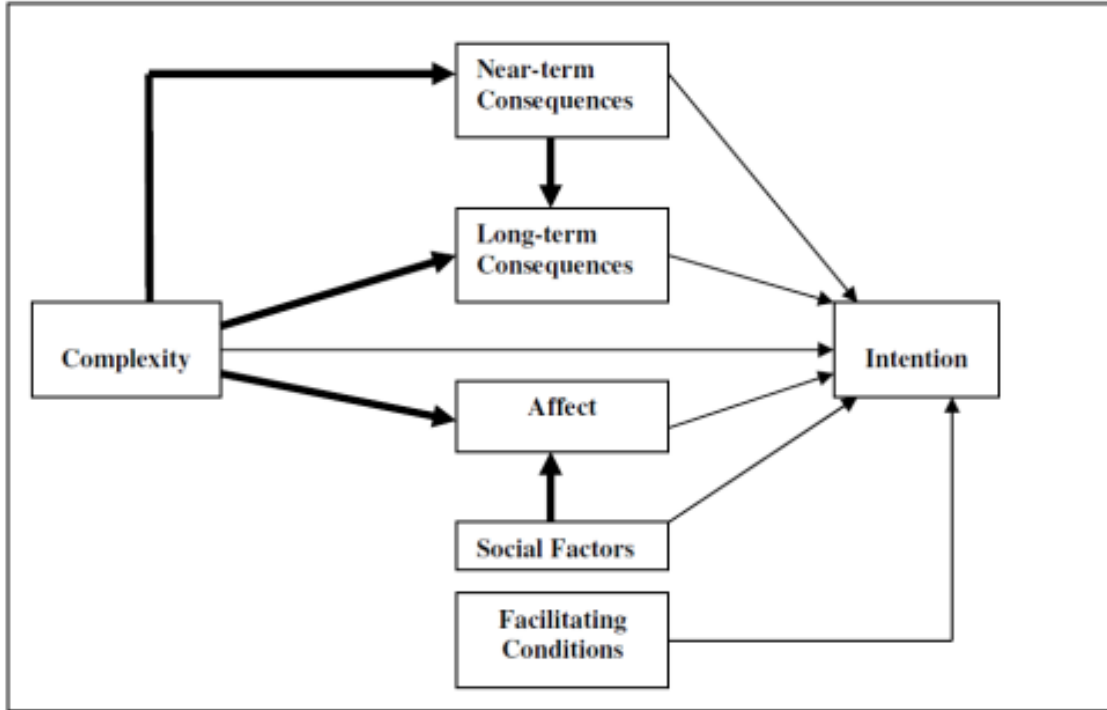


Figure 4-18: Triandis' extended model of choice.

Source: Chang and Cheung (2001).

The authors compared the three different sets of models as follows:

- The first model posits that affect, social factors, and consequences directly influence intention.
- The second model expanded the first model by adding the direct path of facilitating conditions to intentions.
- The third model is composed of the first and the second model with the integration to the direct relationship of complexity and near-term consequences, long-term consequences, and affect (refer to the arrows in Figure 4-18).

4.11 The Unified Theory of Acceptance and Use of Technology (UTAUT)

Venkatesh et al. (2003) built their research on the basis of aggregating all the researched constructs in the previously introduced models to help the IS and IT researcher by having one model for technology acceptance research and unifying the

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views of technology acceptance. They aggregated constructs from TRA, TPB, TAM, combined TAM–TPB, DOI, SCT, MM, and MPCU with prior comparisons between them from the validation and limitation sides. The final results of these comparisons included the following reported considerations:

1. Simple and individual-oriented technologies were studied.
2. The measurement in all studies was cross-sectional.
3. The participating users in the conducted studies were all students, except for a few researchers.
4. Participation in these studies depended on the volunteering usage context, which made it difficult to generalise results in the case of mandatory usage.

Venkatesh et al. (2003) then compared the eight models in four different organisations with a group of individuals who were introduced to a new technology and asked to use it. The measurement of their actual use behaviour was conducted directly after training them on the technology, 1 month after implementation, and again after 3 months. The collected data were classified into two categories: one for the mandatory setting and the second for the voluntary setting. The findings showed that user experience, user age, gender, and voluntariness were moderating factors, all of which had been identified by previous research as moderating variables. The validity of MM and SCT was increased after including the mentioned four moderators. The authors then compared the eight models again to extract the commonalities among them; they found seven significant constructs that were direct determinants of the user's intention to use the new technology. In their next step, the authors studied these seven again and finished by hypothesising that four of them—PE, EE, SI, and FC—play a major role in determining the usage behaviour and, accordingly, the user's acceptance of the new technology. On the other hand, they hypothesised that the attitude, CSE, and anxiety do not have an effect on the user's behavioural intention. Figure 4-19 shows the relationship among these constructs.

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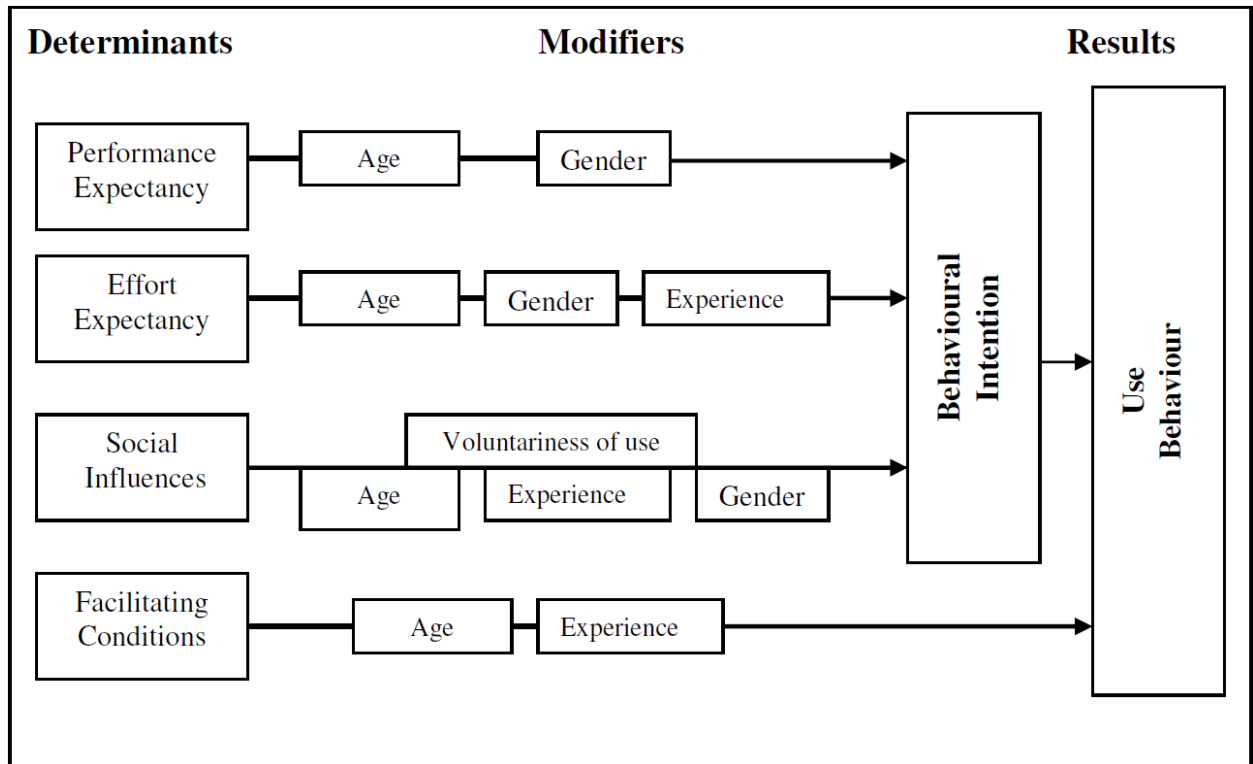


Figure 4-19: The unified theory of acceptance and use of technology.

Source: Venkatesh et al. (2003).

The authors highlighted the relation between these four constructs and variables similar to those of the other eight models, as summarised below:

- Performance expectancy (PE)** is the degree to which an individual believes that using the system will help him or her to attain gains in job performance. The other models included constructs that pertain to PE. These include the extrinsic motivation from the MM, perceived usefulness from TAM and the combined version of TAM and TPB, relative advantage from DOI, outcome expectancy from SCT, and the job-fit from MPCU. These constructs represent the strongest predictors of the use intention in their models. During the measurement process, they emerged as significant determinants at all the measurement points, either in the mandatory or the voluntary settings. PE is hypothesised to be a moderating factor for the behaviour intentions, while the gender and age were always moderating PE itself. Younger workers reflected that clearly in the measurement processes.

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- **Effort expectancy (EE)** is defined as the degree of ease associated with the use of the technological system. The other models included constructs that pertain to EE. These include the ‘perceived ease of use’ from TAM and ‘complexity’ from both of the DOI and MPCU models. Both of these constructs were significant determinants in their models at the stage of post-training measurement. EE influences the behavioural intention, and this influence is moderated by the age, experience, and gender of the user. Hence, this hypothesis will be stronger for the case of young women and older users who have less experience.
- **Social influence (SI)** is the extent of the attention that an individual gives to the belief of other individuals that he should also join them in using the new technology.
- **Facilitating conditions (FC)** refer to the extent to which the user of new technology is supported by an existing organisational and technical infrastructure.

In the empirical test, the authors recognised that the validity of the content was limited because of the measurement procedures. For this reason, it has been recommended that the researchers in the future should focus on the development and authentication of the relevant measurements for each construct with a priority on the accuracy and veracity of the content (Venkatesh et al., 2003).

4.11.1 Research applying the UTAUT model

The UTAUT model was formulated by leading researchers in the field of technology acceptance study. The model is based on conceptual similarities among eight dominant models in the field. According to its authors, the UTAUT is a definitive model that synthesises what is known and advances cumulative theory while retaining a parsimonious structure. Although published studies adopting this model are still scarce, this does not diminish the power of this model compared to all other technology acceptance models.

Li and Kishore (2006) studied the invariance of the new measurement scale for the UTAUT instrument to examine whether the focal point of the UTAUT model was

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consistently alike across various subgroups of Web log system users. Results showed that the difference in the respondents were highly based on the demographic profiles of the users, such as gender, general knowledge on the use of the computer, specific knowledge on the use of the Internet, experience with Web logs, and frequency of using Web logs.

Results showed that there was a similar interpretation of both performance and effort expectancies among the respondents despite their dissimilar experiences and knowledge in using computers and the Internet. The researchers recommended that there must be a careful evaluation and interpretation of the model's results since they showed that the majority of the subgroups' scores reflecting their acceptance of online community Web log systems such as social media and the Internet were similar and consistent. Another recommendation is that future studies must be more consistent and homogeneous in terms of variance in the formulation of UTAUT, which this study failed to achieve (Li & Kishore, 2006).

Wang and Yang (2005) extended the UTAUT to fit with their study on online stocking in the financial market by adding the personal trait construct to the model. They used this extension to explore the role personal traits play in the UTAUT model as indirect or intervening. The personal traits studied were the big five factors (or FFM), categorising personality traits into extraversion, conscientiousness, agreeableness, neuroticism, and openness. In their research design, personality traits were hypothesised to affect the participants' intention to adopt online stocking indirectly through UTAUT constructs in the first design model and in the second model to moderate the effect of UTAUT constructs on the participants' intention to adopt online stocking. For simplification purposes, the other moderators in the original UTAUT model were removed except for Internet experience.

The results showed that the variance explained in the intervention was very low compared to the moderating effect, which was 60%, suggesting that personality traits play more important roles as moderators than do external variables. For the first model design, results suggested that among the five different personality traits, the extraversion trait affected intention through the four key constructs of UTAUT. The openness trait, however, affected intention through the effort expectancy construct and facilitated the condition construct. As for the second model design, the results found that Internet

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experience and the openness personality trait unexpectedly moderated the relationship between the PE construct and the participants' intention to adopt online stocking, with negative effect. The trait of agreeableness with Internet experience moderates the SI–intention relationship with positive effect, as does the trait of conscientiousness with Internet experience, which moderates the SI–intention relationship but in a negative manner. Finally, neuroticism with Internet experience was found to significantly moderate the FC–intention relationship with positive effect. The authors recommended that future research may reconsider the moderators in the original UTAUT model to supplement it (Wang & Yang, 2005).

The UTAUT model was adopted to explain mobile advanced services and device adoption on an individual level and within a mass use context. The Carlsson et al. (2006) objective was to examine the factors affecting the intention to use and factors affecting the use of mobile devices/services. The effects of attitude toward using mobile devices/services and mobile devices/services anxiety on behavioural intention and the use of mobile services were examined in addition to the original paths in the model.

The results showed that PE and EE had a strong direct effect on intention to use mobile devices and that such an effect was weakened when attitude was added to the model, which indicated that attitude explains part of the intention to use a mobile device. SI also had a significant, positive, crude effect on intention; however, the effect was not sustained in all models examined. Anxiety did not have a direct effect on intention, but rather the influence was mediated by other variables such as PE and SI. Attitude did not have a direct effect on intention, which confirms the original model assumption that with presence of EE and PE, attitude would not have a direct effect on intention.

Moreover, when analysing the actual use of three different mobile services, intention to use had a significant, positive, direct influence on the use of the studied services, but when the model was adjusted for the other variables (EE, PE, FC, anxiety, and attitude) the direct effect of intention disappeared. The authors argued that these results showed the central part played by these variables in the influence of behavioural intention on the use of mobile services. Using logistic regression models, the results showed, for all occurrences studied, that incorporating behavioural intention into the model would diminish the effect of independent variables on the use of mobile services

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(with one exception when FC is the independent variable for one of the services studied, ringtones). Thus, the assumption that PE, EE, SI, FC, anxiety, and attitude affect usage through behavioural intention is partly correct. Likewise, FC did not have a direct influence on the use of mobile services nor an indirect effect through behavioural intention.

The authors acknowledge that the results obtained do not support in all cases the original UTAUT hypotheses. Thus, their earlier reservation on the use of the UTAUT for explaining both behaviours of intention/usage of mobile devices and mobile services in an asynchronous manner was fairly justified. The authors argued the need for modification or extension of the model used to account for the differences in the adoption behaviour of the mobile devices and services (Carlsson et al., 2006).

Knutsen (2005) used a subset of the UTAUT to explore the relationship among expectations related to performance of a new mobile service, efforts needed to utilise new mobile services, and how these constructs affect attitudes towards new mobile services. The research design consisted of PE and EE, age as an antecedent to the UTAUT constructs, and attitude as subsequent to the two constructs of UTAUT. Also, EE was hypothesised to affect PE.

Data were collected in two time periods: pre-launch of the trial service and 2 weeks after the m-service trial. The empirical results significantly verified the relationship between PE–EE and attitude as well as between EE–PE. Results also suggested that PE and EE are strong determinants of attitude toward new mobile services. Increased age was found to be connected to lower levels of anticipated ease with new mobile services. However, age appeared to have a positive effect on PE, indicating that older individuals have higher expectations of new mobile services (Knutsen, 2005).

To sum up this chapter, Section 2.12 provides a summary of the common threads and identifies the similarities and differences found among the previously discussed models that are dominant in the area of technology acceptance literature.

4.12 Summary of the Technology Acceptance Models

The correlation of the first three out of the nine models based on the scope and delimitation set by the researcher and the development of each model are outlined in the previous discussions. It must be noted that some technology adoption models are linked to and can be explained through psychological concepts such as theories of peer pressure and self-efficacy.

The table below summarises the correlative determinants among the following technology acceptance models:

Table 4-2: Determinants of Behaviour in Technology Acceptance Models

Model	Determinants of behaviour
TRA	Individuals' perceptions + attitudes towards the behaviour + social influences
TPB	Attitudes towards behaviour + subjective norms + perceived behavioural control (PBC)
DTPB	Attitudes decomposed to relative advantage (perceived usefulness), complexity (ease of use), and compatibility + subjective norms + PBC decomposed to self-efficacy and facilitating conditions (Taylor & Todd, 1995a & b)
TAM	PU + PEOU
DOI	Innovation attributes + innovators' characteristics
SCT	Self-efficacy + outcome expectations + affect (Venkatesh, 1999)
MM	Intrinsic motivation (enjoyment +fun) + perceived benefits (PU) + external pressure (i.e., social pressure) (Igbarial, 1996)
MPCU	Peoples' beliefs + affect + social norms + perceived consequences + habit + facilitating conditions.
UTAUT	Effort expectancy + performance expectancy + social influence + facilitating conditions

A compare and contrast analysis on the above-mentioned belief/ perspective models is outlined below:

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1. SCT differs from both TAM and DOI since the former believes that outcomes have no connection to the behaviour pattern of the technology user (given the differences in individuals' abilities that limit their capacity to perform), while the latter does.
2. To some extent, both SCT and TPB have similarities in terms of non-outcome beliefs that can possibly affect user behaviour. In contrast, SCT introduced the concept of self-efficacy, whereas TPB integrated the PBC as a factor affecting the behaviour. These factors were further pulverised into self-efficacy and facilitating conditions, as discussed by Taylor and Todd (1995a & b). The self-efficacy and the facilitating conditions were derived from Banduras' SCT and Triandis' frameworks, respectively.
3. TPB, TAM, and DOI unanimously posit that cognitive beliefs may be influenced by the environment, which also affects the user's conduct and conviction. Meanwhile, SCT upholds the mutuality among conduct, personality, and beliefs. Hence, one's self-image is a product of correlation.
4. Save for Triandis' framework on the inverse relationship between the behavioural tendencies and degree of preferences, TAM and TRA are similar to MPCU in terms of the significance of the degree of preference over conduct prediction and analysis.
5. Both Triandis and Bandura caution that the components of perception such as cognition and affection must not be intertwined.
6. The contexts of satisfaction and distress which comprise Bandura's SCT and Triandis' MPCU are congruent with the motivational model's intrinsic motivation.

Related literature and studies are presented in this chapter regarding the eight technology acceptance theories and models in discovery of the UTAUT model. Noteworthy is the comprehensive comparisons made between the two models. For instance, models like the TAM uphold frugality, albeit not fully explained, unlike the other models, albeit complex and impracticable, which comprehensively illustrate the premises affecting the acceptance behaviour (Triandis, 1979; Valler, 2000) Between the two and even with comparison to the other previous models, the UTAUT model is known

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for being substantially sufficient and frugal in explaining the differences among usage intentions.

Chapter 5
Research Methodology

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5.1 Introduction

The research methodology will be described in this chapter in detail. The research philosophy, approach, design, and tools/methods used to address the research aim and objectives will be addressed.

Empirical research comprises the following processes, as identified by Cresswell (2005):

1. Problem identification
2. Literature review
3. Specifying the purpose of the research
4. Data collection
5. Data analysis and interpretation
6. Evaluation and reporting

Thus, identifying the research problem is important because it helps in identifying the research goal, which dictates the subsequent data gathering activities and how the data are analysed. It is important, as well, to define the relationship between the research problem and goal to help in choosing the research approaches and methodology. The following table (Table 5-1) illustrates the relationship among the topics under research, the research problem, the research goal, and the research questions (adapted from Cresswell, 2005).

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Table 5-1: Research Artefacts

Artifact	Description/circumstance
Topic	Developing conceptual framework for implementing SC in HE with highlight on the key factors that affect using SC in HE.
Research Problem	In the Gulf States, there are many challenges which confront the teachers and students in the university level and make it harder to achieve higher learning and teaching goals. Some of these challenges arise from the segregation between male and female students, and building separate campuses for each group. This issue affects the learning outcomes and generates low level graduates when benchmarked against the similar levels in USA and Europe.
Goal	This research aims to develop and propose a framework for effective implementation of the SC tools in HE in order to enhance the teaching and learning processes in the HE institutions in the Gulf States, and promote the learning levels to match the standards and align with the highest levels of education in the world.
Research Question	How effectively SC tools can be implemented in the HE institutions to leverage or enhance the teaching and learning processes in the Gulf States' academic institutions. What are the key factors that affect the use of SC in HE and how can the new learning systems be developed to consider SC as learning tools.

The remaining sections of this chapter introduce the research methodology, including the research philosophy, research approach, research data, research strategy, data collection methods, data collection strategy and the approaches used for the data analysis.

5.2 Research Methodology

As defined by Collis and Hussey (2003), a research methodology is an orderly systematic approach taken toward data collection and analysis. It can be defined as the overall strategy that a researcher applies to achieve the overall aim and objectives of his or her research. It can be thought of as the tool that defines the path that the researcher takes to reach the research destination.

This study aims to define the moderator factors that affect the user acceptance of using SC in learning activities in order to develop a new framework for implementing SC in HE. The framework works as a theoretical base for implementing SC in the Gulf States' institutions. It begins with a review of the available literature about the HE issues in the Gulf States and the available best practices for using SC in HE all over the world. Then it proposes a framework for deploying SC tools in an effective way to enhance teaching and promote student learning. Finally, it ends by developing a prototype for an online course system to ensure the right instantiation of the framework. Heuristic evaluation and pedagogic audit will be conducted as necessary tools to ensure the effectiveness of the proposed framework and system prototype.

The overall research process is depicted in Figure 5-1, while the detailed research process that is used in this research is shown in Table 5-8. The overall process has nine stages, in which a variety of research methods are employed to achieve the defined research objectives. Further details will follow to justify the reasons why these methods were chosen as suitable for this research.

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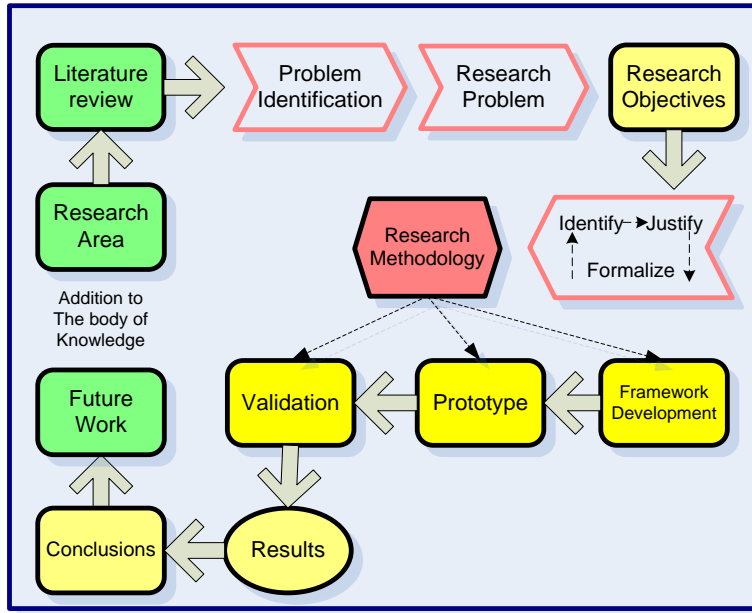


Figure 5-1: The overall research process

5.3 Research Philosophy

A research philosophy embodies the researcher's beliefs about the phenomenon under investigation (Galliers, 1991). To introduce the research philosophy, there are two prevalent philosophical branches, namely ontology and epistemology. Logically, epistemology comes after ontology.

Ontology is the study of the nature of reality or existence in general and its categories and their relations (Lawson, 2004). Epistemology is concerned with the theory of knowledge and how we think of reality and the methods we use to evaluate things. It is needed to determine true from false and to obtain and use knowledge of the world around us (Landauer & Rowlands, 2001). Thus epistemology is the philosophy of knowledge that helps the researcher to understand what knowledge is, describes the ways to achieve it, and answers the question, how do we come to know and what have we uncovered.

Guba and Lincoln (1994) proposed that there are two known ontological positions that interpret the relation between the researched phenomenon and its actors: objectivism and constructivism. Objectivism is the ontological position that asserts that the existence of a phenomenon and its actors are independent from each other. They are in a constant state of revision and are not produced by the interaction between the phenomenon and the

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actors. The second ontological position is constructivism, which asserts that the phenomenon and its meaning are always accomplished by its actors. This means that an objectivist thinks that there is one objective reality and all of us have the same interpretation and experience of it, while the constructivist thinks that the reality is constructed differently by each of us as per his/her interpretation and experience of it.

On the other hand, two epistemological philosophies were identified by the Western tradition of science, namely, positivist and interpretivist (Galliers, 1991). Each philosophy makes various metatheoretical assumptions about each of the above-mentioned philosophical branches, and similarly about the research objects, methods, theory of truth, validity, and reliability. In his class notes, Jörgen Sandberg (2003) developed a table (Table 5-2) to highlight the differences between positivist and interpretive research approaches. It collects the main assumptions of each to facilitate the discovery of the best-fit paradigm for a particular research.

Table 5-2: Differences between positivist and interpretive research approaches

Assumption	Positivism	Interpretivism
Ontology	Person (researcher) and reality are separate.	Person (researcher) and reality are inseparable (life-world).
Epistemology	Objective reality exists beyond the human mind.	Knowledge of the world is intentionally constituted through a person's lived experience.
Research Object	Research object has inherent qualities that exist independently of the researcher.	Research object is interpreted in light of meaning structure of person's (researcher's) lived experience.
Method	Statistics, content analysis.	Hermeneutics, phenomenology, etc.
Theory of Truth	Correspondence theory of truth: one-to-one mapping between research statements and reality.	Truth as intentional fulfillment: interpretations of research object match lived experience of object.
Validity	Certainty: data truly measures reality.	Defensible knowledge claims.
Reliability	Replicability: research results can be reproduced.	Interpretive awareness: researchers recognize and address implications of their subjectivity.

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Thus, the positivist thinks about reality as it can be observed, studied, and modelled, while the interpretivist thinks that the reality can be interpreted and theories can be proposed to define new knowledge according to that interpretation. In this research, the researcher goes through applying existing knowledge about SC and implements it in the HE institutions in the Gulf area to employ its capabilities to enhance the teaching and learning processes. This research adopts the surveys, questionnaires, and interviews as tools for gathering data about the real situation and issues of HE in the Gulf States. Then, it adopts ideas of using SC tools to diagnose these issues. Student opinions, faculty interviews, expert evaluation, and pedagogical audit are necessary methods for obtaining data about the effectiveness of implementing SC in the institutions.

The data-gathering approaches and the way the researcher applies existing knowledge on HE in the Gulf States reflect an objectivism ontological position, while the epistemological position for the researcher throughout the study is positivism, as the research depends mainly on the approved theories of technology acceptance plus the successful implementation and best practices for using SC in HE. The researcher applies existing knowledge about SC and its use in HE to support HE institutions in the Gulf States by employing new teaching and learning methods that are expected to enhance these processes.

5.4 Research Approach

The research approach refers to the way of defining the reasoning or logic of the research (Loose, 1993). It clarifies the role of the existing knowledge body, which has been studied in the literature review, and the way the researcher utilizes the collected data and analyses them. Two methodological research approaches were highlighted by Yin (1994), the inductive and the deductive approaches. The inductive approach is defined as an inquiry undertaken to understand a human issue or explore a social problem from various perspectives. It starts with an investigation of an untheorized area in order to develop a corresponding theory. However, the deductive approach starts with an already existing theory and extends to its empirical investigation (Yin, 1994). In most of the research cases, it is hard to separate the two approaches. Usually, both approaches are

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involved; even more often, combinations of the inductive and deductive approaches are applied simultaneously (Richards, 1993). In general, a combination of the two approaches helps to more effectively achieve the specific research goals.

Loose (1993) identified deductive research as the testing of a pre-developed conceptual and theoretical structure through empirical observation. The term *pre-developed* refers to the first step of deductive research, which includes a review and analysis of the literature in the field under research. Such literature review is expected to lead to highlighting an area in the field that had been inadequately researched or in which a dearth of knowledge existed. Then the researcher highlights the area and proposes his or her questions about it and, consequently, defines the research problem. After that a set of hypotheses is expected to be formulated and might lead to a second set of sub-hypotheses. The hypotheses formulate a conceptual model that could be specified to tackle the identified problem. The next research step will be data collection and analysis, which should result in findings closely related to the reviewed literature.

Inductive research, on the other hand, applies a less structured methodology to investigate a problem more deeply (Sutrisna, 2009). Inductive research does not propose hypotheses, but is open to any results without influences of presuppositions (Glaser, 1978). An intermediate step of data collection is expected to answer the research question. Then theories and explanations are developed to fit the results of the data analysis.

To sum up this discussion, the deductive researcher composes one or more hypotheses based on the existing knowledge body, then conducts data collection and analysis to test the hypotheses; however, the inductive researcher collects and analyses data to come up with new theories and explanations using the existent knowledge body and from them develops new findings. Because of its reliance on the current body of knowledge in composing a hypothesis, deductive research aligns with the objectivist and positivist philosophical positions.

In this research, the existing knowledge about SC tools and their use in HE plus the approved theories of technology acceptance will serve as a basis for composing a new set of hypotheses on the use-factors that affect user acceptance of SC tools in HE. Considering the nature of this research study, both inductive and deductive approaches

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are being used. A conceptual framework will be developed from the review of the existing literature about SC, issues of HE in the Gulf States, and technology acceptance theories. This development adopts the deductive approach as it goes from the existing technology acceptance theory, the Unified Theory of Acceptance and Use of Technology (UTAUT), to define the factors that affect the user acceptance of using SC in HE in the Gulf States. After that these factors help in theorizing the effective implementation of SC through offering a new conceptual framework for implementing SC in HE in the Gulf States. The research starts with set of hypotheses that being studied in two case study institutions in the Gulf States. Merriam (1988) argues that the nature of such case studies mostly utilizes an inductive approach due to new concepts, understandings, and relationships arising from studying the collected data.

So, this research study develops a new framework for adopting SC in the Gulf States as a new theoretical reference for enhancing the teaching and learning practices in this region of the world. This concept is new and represents an addition to the knowledge body. It also comes through qualitative research approach in which the collected user knowledge about SC was interpreted. This means an inductive approach is being conducted. The research also analyses the use of UTAUT theory, and extends it through developing new constructs and relationships, which confirms that an inductive research approach is used.

To sum up the philosophies and research approaches used in this research, it can be said that this research adopts the objectivist and positivist philosophical stances and employs a combination of inductive and deductive research approaches. Figure 5-2 illustrates the interaction of these approaches and philosophies.

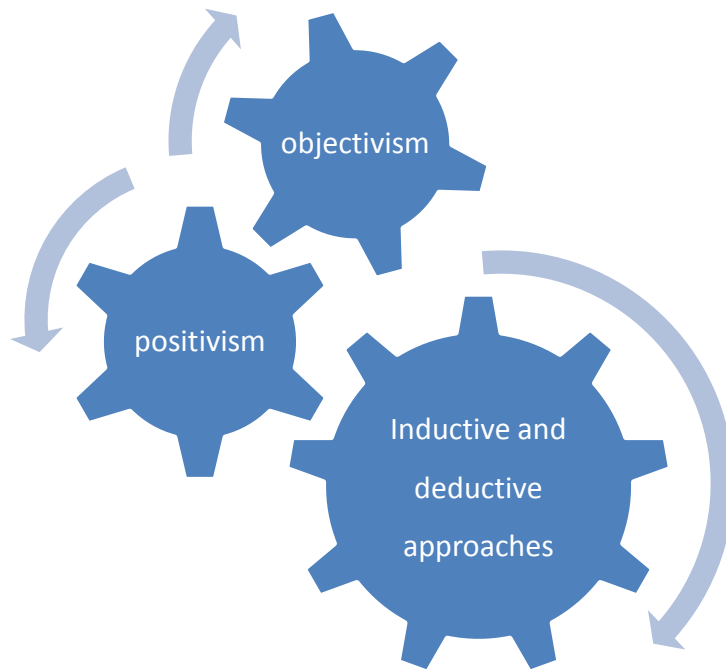


Figure 5-2: Research philosophies and approaches.

5.5 Research Strategy

Among many research strategies, the qualitative and quantitative strategies are highlighted by Casebeer and Verhoef (1997) as the main research strategies available for primary data research. Quantitative research strategies, known by as “scientific methods,” study the relationships between facts through gathering factual data about them (Fellows and Liu, 1997). The analysis of the quantitative data generates quantitative results that are derived in light of the studied theory and literature. As summarized by Bryman and Bell (2007), the steps in conducting quantitative research are illustrated in Figure 5-3.

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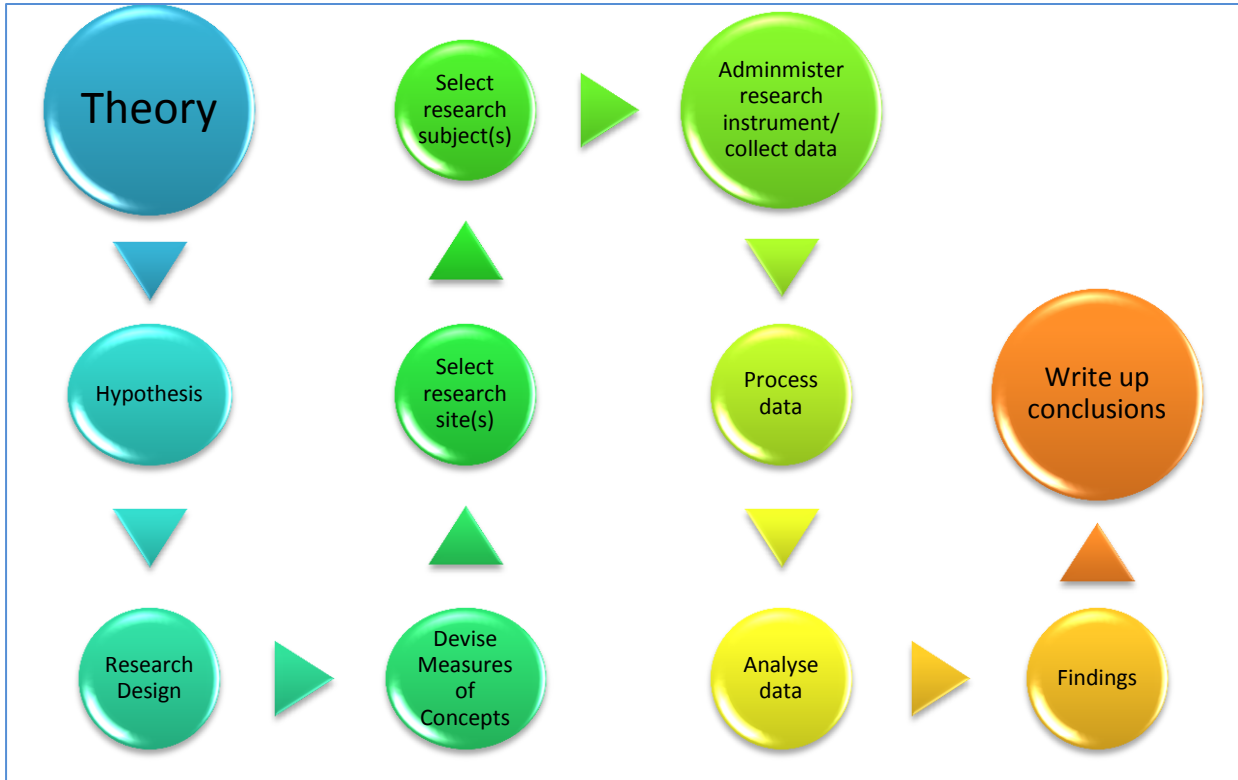


Figure 5-3: The process of conducting quantitative research

On the other hand, qualitative strategies concern the ways of evaluating and theorizing problems and approaches (McKie, 2002). They focus on the qualities of the studied phenomena rather than the numerical measurements of them. Qualitative methods assume that there is no single objective reality and hence the observed reality will be based on the interaction between the researcher and the investigated phenomena. These methods usually yield rich data or unanticipated findings depending on the collected evidence and explanation of the studied factors. The steps in conducting qualitative research are illustrated in Figure 5-4.

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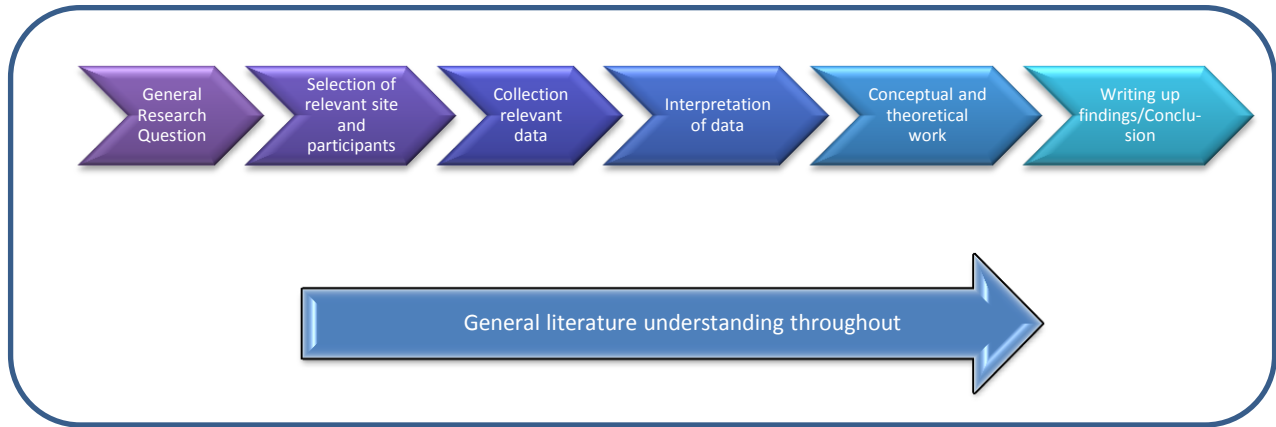


Figure 5-4: The process of conducting qualitative research

Table 5-3: The distinctions between and concepts associated with the quantitative and qualitative approaches.

Table 5-3: The distinction and the associated concepts to quantitative and qualitative strategies

Factor of distinction	Concepts usually associated with the qualitative methods	Concepts usually associated with the quantitative methods
Type of Reasoning	Induction Subjectivity Meaning	Deduction Objectivity Causation
Type of question	Open-ended Process-oriented	Pre-specified Outcome-oriented
Type of analysis	Narrative description Constant comparison	Numerical estimation Statistical inference

A research strategy may include archival analysis, survey, experiment, and observation (Yin, 1994). In this research, case study, observation, interviews, and survey questionnaires are used as research strategies. As pointed out by Yin (1994), when focusing on contemporary phenomena, the case study method will emerge as the most suitable research strategy. This study focuses on a contemporary problem. It identifies factors that affect today students’ learning in HE institutions in the Gulf states and defines how SC tools can solve these issues by introducing better and modern teaching and learning methods and ultimately promote learning. Yin (1994) mentioned that the case study methodology has been recommended by many researchers as an ideal instrument for understanding many context phenomena. Furthermore, the most important

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aspect of any credible research strategy is that the investigator should adopt a stance of neutrality with regard to the phenomenon under study (Patton, 1990).

5.5.1 Selection of the Case Study

Yin (2003) defined the case study method as an empirical inquiry that is conducted to investigate a contemporary phenomenon within its real life context. As summarized in the research strategy section, the case study approach is the method recommended by Yin (2009) for areas that are not well theorized. Thus, selecting a suitable case study organisation plays a key role in the success of the research project. The case study helps the researcher to examine the organisation that has the identified research issues with flexibility and in a lively manner in order to study the issues, especially in the stages of data collection and analysis. Patton (2002) justified the selection of case study as research tool by offering rich information about the researched phenomenon and by offering a useful manifestation of the phenomenon under research.

United Arab Emirates University in the United Arab Emirates (UAE) and Aspire Academy for Sports Excellence in Qatar are two governmental educational institutions that have the large share of their students coming from local students. The students are expected to reflect their own country culture in their behaviours. Also, in these institutions, male and female students are segregated among campuses spread over a wide geographic area. So, most of issues in the academic institutions in the Gulf region will be easily highlighted and challenging in these two institutions. This means that the choice will represent a significant case with enough decisive factors for study. These institutions are large institutions in terms of student enrolment and physical facilities. Moreover, UAE University is a very challenging case because of the soaring demand for enrolment, with the priority given to local students, who represent 80% of the student population at the university (UAEU, 2010). Aspire Academy for Sports Excellence is another significant case because of its characteristics. The academy educates athletes who are always busy with sports activities such as training camps, championships, travelling abroad for tournaments, and studying while participating in sports. They need to learn in very flexible and customizable environments. SC is expected to offer a great solution,

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with effective and flexible learning and assessment platforms. It is expected to develop a supportive and responsive learning environment.

Thus, the rationale for selecting this case study was to study the current situation in these institutions within particular class groups or communities and to highlight the clear issues of the students' learning. Some survey questionnaires and interviews will be conducted. Also an observation of the use SC and technology within these institutions will be done to collect accurate data about the real conditions of learning and teaching practices there.

5.5.2 Research Data

Two types of research data could be collected and analysed: quantitative and qualitative data types. Quantitative data requires quantitative research methods, while qualitative data requires qualitative methods. Fellows and Liu (1997) mentioned that the analysis of quantitative data yields quantified results that are extracted from the evaluation of the data according to the available literature and theories. On the other hand, qualitative methods concern the qualities of the phenomena under research rather than measuring it numerically. The analysis of qualitative data yields rich and complex results. The qualitative researcher focuses on understanding and analysing researched real-world phenomena within the context of a reality. Their beliefs emerge from their interpretivist style.

This research employs both quantitative and qualitative data and methods. The collected data will be generated from student surveys and questionnaires, interviews, observations, and focus groups. These data will be analysed based on the approved theories and best practices for using SC in education.

a) Data collection methods

The term method refers to the used tool in collecting data and analysing it. In the research studies that adopt the case study strategy, there are many collection methods that could be used. These methods include questionnaires, observation, interviews, focus groups, and gathering of documentation and artefacts (Gillham, 2000).

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b) Selecting the research methods and tools

Determining the appropriate data collection method for a study requires deep understanding of the task requirements to ensure that the appropriate measures are considered. The following points should be considered before selecting a certain research method/tool:

- ✓ When analysing gathered data using the method, any special requirements or difficulties in conducting the data analysis must be noted.
- ✓ In prototyping and user design evaluations, some human-factor issues might be raised and should be taken into account.
- ✓ Deep understanding of the task requirements results from selecting the appropriate measure.
- ✓ The cost of each method (in terms of time, effort, mental load, etc.) should be considered carefully. Each method has its cost, and usually researchers use more than one method together. For example, questionnaires might be used with observation. Observation itself might be used in combination with interviews to analyse user understanding and workload. So, considering the research goals and constraints helps the researcher to ensure the selection of the appropriate research methods and tools.
- ✓ Any advantages or disadvantages of the research method should also be considered.

The following sections introduce the used methods and tools with a focus on the advantages and disadvantages of these methods (questionnaires, interviews with students and instructors, focus groups comprising instructors and/or students, observation, workshop, experimental design/prototyping, and expert evaluation).

i. Questionnaires

As defined by Patton (2002), a questionnaire is used to collect information about the participants, such as age, gender, location, occupation, and their experience with using a certain tool or technology. The demographic information usually helps in defining the user type and the features of the group that completes the questionnaire. Using questionnaires in gathering data has the following advantages:

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- Questionnaires are cost-effective methods.
- Generally, the questionnaire is quick to complete.
- The needed time to organize and analyse the data from a questionnaire is usually short.
- The questionnaire serves in many cases when access to the targeted user is limited. Technology tools help in delivering surveys and collecting responses.
- It might include an explanation about its questions; so, there may be no need for additional explanation to the users.
- In case anonymity is required, the questionnaire can protect the identity of the respondent.
- Most questionnaires are compatible with automation. So, technology tools can provide a facilitator for the respondents in terms of delivery and response data entry. The automated questionnaire eliminates the manual data entry.

On the other hand, there are some disadvantages of using questionnaires in data collection:

- The collected information is usually not as rich as information collected by some other methods such as interviews and focus groups.
- Respondent bias might affect the collected data and plays a major role in the quality of the data. For example, some people tend to select the middle option all the time.
- Some question types might need high motivation from the respondents. For example, the open-ended question usually needs more motivation from the user to answer it. And sometimes users do not answer such questions accurately or fully.
- In some cases, responses to open-ended questions can be difficult to analyse and report.

Using questionnaires, the researcher can collect data about a set of factors in a short period of time. In the current research, the questionnaire has two parts. Part A consists of 4 sections:

Section 1 involves filling out a user profile including his/her gender, age, nationality, profession, number of years of using the Internet, and how much time he/she

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spends in using the SC websites. This section was developed in order to construct user categories with respect to age, gender, culture, and familiarity with the Internet and SC websites.

Section 2 concerns the social activities the users considers to be important when using online social services and, from this, the top topics he/she considers when engaged in using social websites and the tools most frequently used (e.g., wikis, blogs, social networks, podcasts). This section was developed to focus on user tendencies and familiarity with different social services, that is, activity preferences, tool familiarity, topic focus, and feelings about whether SC supports his/her activities and preferences.

Section 3 consists of questions about the benefits, drawbacks, and impacts of using SC in general. This section aims to define the different benefits of using SC from the users' perspective. It also concerns the drawbacks they may be aware of. These benefits and drawbacks could help in defining user perceptions about these tools. It also could help in defining user concerns that should be considered when implementing SC in any type of business. The Interviews section of this paper focuses on education; that is, it offers information about benefits and drawbacks but with a focus on the business of education.

Section 4 focuses on the values that might be considered when using social websites and the expectations and improvements that should be considered if such websites were to be developed or serve a newer generation. This section extracts some of the users concerns and values. This is an important section when considering the different cultural norms, especially in the Gulf States, on which this study focuses. In fact, the cultural norms represent a real barrier in developing collaborative learning in the Gulf States universities. People there are always careful about any type of interaction between men and women. Most of the universities segregate male and female students either by building separate institutions or by developing separate campuses for men and women within institutions.

Part B comprised two sections.

Section 1 involves collecting the user's demographic information.

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Section 2 deals with the different factors that might affect the implementation of SC in HE. Although this part was offered to the same sample of users, it was offered also to an expanded group of users to avoid any bias from the researcher based on the analysis of Part A. The information collected was scanned again to define the extra users and define the analysed user in Part A. Section 2 of Part B targeted the study of the different use-factors that might be considered when using social and new technologies at all. Reviewing the technology acceptance literature revealed that users of social services always pay attention to the following factors:

- **Privacy.** For any layperson using SC, security of communication is the primary concern when private information is shared.

- **User Reputation.** Blau (1964) generalised his hypothesis about personal engagement in social interactions, stating that they mainly seek approval, status, or respect. These three requirements reflect directly on the user's image or reputation.

- **Expected Relationships.** Individuals believe that they can improve relationships with others using the social service(s).

- **Communication Benefits.** It refers to the other possible benefits that the user can gain from using SC. Logic would suggest that this factor should be and will be the most important in determining the adoption level of SC in any organisation.

- **Collaborative Norms.** Social influence concerns the extent to which an individual believes that others feel that it is important for the individual to use the system. Social influence and social norms, as mentioned by Venketash et al. (2003), strongly influence knowledge sharing. This thought was not shared by Gunther et al. (2009). They suggested that it is not social influence but "Collaborative Norms" that have a positive impact both on knowledge contribution and knowledge seeking. This is because individuals perceive collaborative norms to be more informal than "Social Influence", where individuals fear their superiors. Moreover, the user of any new technology always pays attention to the following factors:

- **Codification Efforts.** The rationale behind SC is frequent updates. This would require efforts from the organisation's employees who have to split their time with the daily tasks (Orlikowski, 1993). From another perspective, SC tools can actually be a

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better means of communication as compared to instant messaging (IM), email, or phone calls.

- **Facilitating Conditions.** This factor is perhaps one that individuals would not think of during the implementation of a new application, but they would realize the initial experiences on the usability aspects of the application. In an experiment conducted by Gunther et al. (2009), researchers determined that employees did not want to move to another application to update Twitter. The tool needed to be integrated tightly with the existing infrastructure. We can then conclude that strong “Facilitating Conditions” are required for the right behavioural intention to use new technologies.

- **Signal-to-Noise Ratio.** Schroeder (1999) defines signal-to-noise ratio as the number of useful signals that can be transmitted through a medium as compared to the noise in an environment. A ratio greater than 1:1 means that the signal is stronger than the noise. Such a signal, which is stronger than the noise, is a better means to keep individuals informed.

The Interviews section focuses on exploring these eight factors in unstructured discussions solicited to collect useful thoughts about any other concerns or factors that might affect the use of SC in a HE setting in the Gulf States region.

Each person who completed the questionnaire from the case study institutions was asked to complete the questionnaire on a due date. The two questionnaires were offered online through SurveyMonkey (<http://www.SurveyMonkey.com>) and QuestionPro (<http://www.QuestionPro.com>) survey service websites. The analysis of these questionnaires is integrated in Chapter 6 of this research. We communicated with the users through email using the surveys’ links. Frequent notices were sent to remind respondents of the approaching deadline. Some instructors from the case study institutions facilitated the deployment process by offering it to their students during lectures. A full copy of questionnaires and their online links are included in Appendix 3.

ii. Interviews

According to the classification of Fellows and Liu (1997), three interview styles can be identified. These are structured interviews, unstructured interviews, and semi-structured interviews. In the first style, the interviewer administers a questionnaire and

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records the interviewee's responses. Some of these responses may lead the interviewer to ask some supplementary questions to obtain more detailed information or pursue new aspects.

The unstructured interviews start with a brief introduction of the topic by the interviewer, who then starts asking questions and records the interviewee's replies. It looks like a monologue between the interviewer and the interviewee, with some prompts to clarify meanings and ensure completeness of statements.

The third interview style, the semi-structured interview, is a style that fills the spectrum between the first two styles. Semi-structured interviews vary in form, from the questionnaire type to a list of topic areas to which the interviewee responds with the interviewer recording his or her views.

Interviews allow participants to express their experiences in their own words. The interview is like a social engagement or discussion between its parties. So, the quality of the obtained information is dependent on the personality and skills of the interviewer. During an interview, more deep information can be extracted; however, a skilled evaluator might be required to analyse the open-ended interview questions. In this research, during the data collection stage, nine interviews were conducted to investigate specific matters, which will be discussed in Chapter 6. All the interviews used in this study are of the semi-structured form.

iii. Focus Groups

As a research method, focus group represents small group discussions between a group of users staged to elicit opinions and information about their experiences. Cresswell (2005), Patton (2002), and Yin (2009) argued that focus group participants might be organisation stakeholders. They might be the same types of individuals or even different stakeholders from the case study institution. Some thoughts might emerge from the focus group individual discussions. It might also raise new concerns related to the topic under discussion. Each focus group has a moderator who has a specific set of goals, which help him or her lead the discussion toward achieving these goals. Focus groups help in filling the gap between professionals and clarify new topics for the included members. Some audio or video recording may help with coding the interview and,

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consequently, help the researcher to analyse the discussed points and thoughts. This study includes focus group discussions using a prepared interview template called FG_Template to fill the focus group sheets with the gathered information from discussions (Tables 5-4, 5-5, 5-6 and 5-7). The filled focus group sheets are attached in appendix5 of this thesis.

In this research, the focus group aims at collecting information about user requirements when using SC tools in the HE setting. The focus on the Gulf States was useful in defining needs with consideration of the existent cultural norms. It also included the expected SC tools that will be available if a new online course system were to be designed. The participants discussed their expectations of such new system capabilities to facilitate learning collaboration, secure assessments, develop continuing engagement of the students, and provide ease of use with mobile capability. Focus groups are recorded by video and included in the study resources DVD.

Table 5-4: FG_Template: Template used for conducting focus groups.

Focus Group:	(Theme)
Aim:	(Provide aim)
Objective statement:	"[the researcher] wants to assess [list: Technology acceptance factors] among [list: Students, instructors, staff, observers] in the case study institutions in order to inform [indicate what this information will be used for].
Pitfalls or advice:	<ul style="list-style-type: none"> -Do not generalize findings to the rest of population (without appropriate inquiry/ analysis) -Do not target seeking individualized responses (if so gather group consensus) -Aim for 5-8 participants per focus group -Conduct at least 1 focus groups for each variable of interest (e. g. Reputation, Privacy, Codification effort) -Conduct focus groups in different user types (Students, Instructors, staff, Observers) -Avoid mixing one sub-group with another that might inhibit expression of opinion -If the focus groups were audio taped, get a transcription of the discussion -Avoid compiling groups of people who associate very closely one another, if possible

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Activity checklist

1. Identify the elicitation questions/statements.

Table 5-5: Activity checklist.

Focus group team activities	Status (e. g. Completed/not completed/requires attention)
Plan the focus group <ul style="list-style-type: none"> o Location: o Participants: o Moderators: o List of questions/statements that need to discuss in the focus group 	

4. **Conduct the focus group.**

Table 5-6: Focus group activities 1.

Focus group team activities	Status (e. g. Completed/not completed/requires attention)
Conduct the focus group(s) After each focus group, the researcher debriefed and summarized the focus group responses that include non-verbal observations. <ul style="list-style-type: none"> • As the focus group, discuss and generate arguments as the researcher documents what participants said for each question and includes this in the summary report • Also note any other observations of interest or areas for improvement 	

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5. Analyse, Interpret and share findings

Table 5-7: Focus group activities 2.

Focus group team activities	Status (e. g. Completed/not completed/requires attention)
<p>A. Analyse and interpret findings based on the focus group objectives, how to organize the analysis and reporting of the focus group data, i.e. findings by specific objective or by issue or by question</p> <ul style="list-style-type: none"> • Look for emerging themes in the text discussion • Look for group consensus or dissenting views • Look for degree of conviction in responses • Capture any key similarities in groups or notable differences. 	
<p>B. Develop arguments based on your findings: The findings are to integrate with this research conducted as appropriately enhancing the body of the knowledge</p> <ul style="list-style-type: none"> • Describe findings by conducting an analyzing the transcript and note-taker's notes 	

iv. Observation

Observation is an effective method in case study research for collecting data on either a formal or an informal basis. Observations complement interviews with additional data about the topic under research (Powell, 1997; Gillham, 2000; Saunders et al., 2000; Yin, 1994; Jankowicz, 2000). Observations can be used as a method to observe the use of certain collaboration tools or the use of specific story-related ideas. In this research, three observation sessions were conducted in computer labs/classrooms at the case study institution in Qatar during the student activity time (free study time) to observe the use of the various SC tools including social networks such as Facebook and microblogging tools such as Twitter.

v. Workshop

Workshops provide the participants with opportunities to reach people from the other organisations concerned regarding the same topic and to consult with them about specific issues. So, it opens a window for group interaction between members who are

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somewhat isolated (Eison & Steven, 1995). Some workshop activities can be carried out using virtual systems and web tools, but the face-to-face workshop delivers more robust discussions and better commitment to the outcomes. The researcher conducted two workshops concerning the implementation of SC in Qatar University and Carnegie-Mellon University in Qatar to participants from around the Gulf States who were participating in a conference on emerging topics in the educational technologies. All participants were university educators, students, and technology experts. The workshops focused on the used strategies to implement SC into their work/organisations and the challenges they faced. The advantages included real-life practices and challenges and robust discussion of the topic; the disadvantages included the difficulty with collecting participants for the workshop. Being participants in regional conferences provided the opportunity to participate in the workshop and made it easier for the researcher to find that group of people from mixed organisations. Although the workshop as a research instrument might be not be justifiable for data elicitation in similar research projects, because of its high cost and time consumption, this particular opportunity might be considered to be an exceptional circumstance. It has provided a good opportunity for the researcher to find some needed consensus on the possibility of enhancing the teaching and learning practices in the Gulf States institutions.

vi. Evaluation and development of the user interface design.

Two types of evaluation have been used during the interface design of the proposed system prototype. One is based on the evaluation of the system users, and the second is based on the domain expert's consultation. In similar design situations, two methods of user evaluation can be used. One is to test one system/interface of the proposed designs by groups of users who might use the system and to highlight user needs and evaluate system usability. But in this case, many groups would be required and each group should include more participants to get more reliable results. The second method is for every user to test all of the design interfaces. This method requires fewer participants than the first method. The design evaluation produces two types of data: qualitative and quantitative. Both can be analysed to determine the better design for users based on the accuracy of task performance, matching the user needs and more better in

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usability (Galitz, 2007). The more rigorous design approach helps in deducing the cause and effect. Some extraneous factors might surface, and they should be controlled as much as possible. Some of these factors might not be able to be controlled, and this should be considered by the researcher. During this research, the design approach of the system prototype included clarification and analysis of the following tasks to ensure a rigorous design was in place.

1. Objective of the design
2. Situation of concern
3. Course of action
4. User analysis, which included:
 - ✓ User description and profile
 - ✓ User categories
 - ✓ User needs
5. Task analysis
6. Functional analysis
7. Requirements analysis
8. Conceptual design
9. Paper prototype

The sequential evaluation approach was used to test the design interfaces/user interaction and design usability. This approach includes participation of groups of users from the different categories, introduction of application-specific guidelines for them, and assignment of specific user tasks. Sequential task analysis and heuristic evaluation were used to develop and finalize the system design.

Nielsen and Molich (1990) defined the heuristic evaluation as the method that involves group of experts in evaluating the user interface designs (prototypes) by applying a set of relevant *heuristics* (design guidelines) while no representative users are participating in that evaluation. Then the discovered usability issues are prioritized and ranked to design/redesign the missing/problematic interfaces. Such heuristic evaluation by experts helps in highlighting obvious usability problems in the early stage before including the end-users to try out the system, and this saves money and time and fewer

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people are needed to conduct the tests. During that, experts are always concerned with making the final interface easy to understand by the novice users.

During evaluation, numerous sets of iterations were performed sequentially to ensure a step-by-step improved user interface. Before starting the user evaluation, typical heuristic evaluation was carried out to address any obvious usability issues. Also in the early design stages, a sequential evaluation approach was adopted in the form of an iterative “design then evaluate” process. This helped in concentrating the user evaluation on serious usability issues and kept the users focused on their exact needs and testing whether they had been met by the design. The involvement of the end users ensures that the user is satisfied with the design and, consequently, increases user acceptance, which is expected to reflect positively on the quality of work and user productivity. Nielsen (2005) discussed the “Usability Heuristics,” the important considerations when adopting such an approach in interface design, and published usability testing factors with analysis of the most known usability problems. During the prototype design, this approach was employed in parallel with expert heuristic evaluation.

5.6 Translation of the used research tools into Arabic Language

In cross-culture surveys, Brislin (1980) highlighted that the “back translation” is a common procedure adapted by the researchers in cross-culture contexts. In this research, bilingual translation was conducted between English and Arabic languages. The translation was conducted by an accredited bilingual staff. Then the translated version was checked against the English version by a PhD-certified English literature Arabic professor. And for confirming satisfaction with the translation and confirmation, the Arabic version was translated back to English and compared the new English version with the original one to ensure the validity of the translation process. The comparison resulted in minor variations that did not affect the overall meaning of the offered questions. After completing the translation checks, a field test was conducted with a group of users from the different categories (instructors, students, staff, and observers) to ensure comprehension of the translated questions and their relation to the whole subject.

5.7 Data Collection Strategy

One of the advantages of this study was that the researcher had full access to the case study institutions because of his membership in both of them. This made the researcher aware of the organisation culture in both organisations plus the Gulf States culture norms in general. That gave him also the opportunity to observe the use of SC closely with the students and colleagues from the teaching staff. The clear concern was the difficulty of recording all observations and the frequent interviews with people about the research topics. This encouraged the researcher to use a variety of research methods to collect multiple evidences of the phenomena under research.

Moreover, because of the mixed research approach (inductive and deductive), it was logical to utilize a set of research methods to ensure collecting data from different sources to help in improving the validity of the study findings. Thus, the researcher adhered to collecting and analysing the research data using a multimethod approach. Each of the data collection methods was considered as a part of a data collection approach that targets improving the quality of research data and the validity of research findings. Patton (2002) defined the combination of multiple data collection methods as “triangulation,” which is usually used to strengthen the study itself. Ghauri and Gronhaug (2002) claimed that triangulation improves the accuracy of judgments and results of the research. Similar comments on the improvements through triangulation were provided by many other researchers (Darke et al., 1998; Easterby-Smith et al., 1991; Gillham, 2000; Myers, 1997; Patton, 2002; Stake, 1995; Yin, 1994). Stake (1995) stated that there are four types of triangulation. Data triangulation (variety of data sources are being used), theory triangulation (various theories are being used), methodological triangulation (multiple sample types and sources are being used), and investigator triangulation (observers are being used).

This research included the interviews, observations, and focus groups that represent the data triangulation. It also used various theories of technology acceptance, which reflects theory triangulation.

The data collection stage includes two parts; the first is to collect information about the usage of SC in the case study institutions which included the first survey questionnaire, observation sessions and interviews with the end users. The second part

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included the second survey questionnaire, workshop and focus group. The logic behind these two stage parts comes from ensuring that the users are aware of the available SC tools and have some command or skills of using it in their life. This part comes before discussing the motivating factors of using SC with the end users. So, the second survey questionnaire was communicated with sub-group of the first part's survey respondents who expressed knowledge about SC and usage of it. I.e. The first questionnaire responses helped in identifying the second survey population. The first questionnaire was answered by 520 respondents and the second one was communicated with 436 of them again based on their personal information (Name and Email) which was collected in the first questionnaire. So, the first one worked like an audit of the user skills of using SC and the second one worked as analysis of the use-factors that affect the use of SC in educational context in HE in the Gulf States. The first part of the data collection stage included also interviews with randomly chosen users from the different categories (Students, Instructors, Staff and Observers), then the second part included included focus groups with users who have been defined as aware of using SC tools. This approach helped the researcher to better justify the analysis of the collected data.

5.8 Methods for Data Analysis

The following steps were introduced by Leedy and Ormrod (2001) as guidance for researchers to analyse the collected data in the case study research:

- Categorization of data: data should be categorized and classified into meaningful groups.
- Interpretation of single instances: specific documents, responses, and other data elements should be considered and examined for specific meaning in relation to the case study.
- Identification of patterns: the data and their interpretations are scrutinized for underlying themes and other patterns.
- Synthesis and generalizations: an overall portrait of the cases. Conclusions are drawn that may have implications beyond the specific case study that has been studied.

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Beside these steps, which were considered and adopted in the analysis of the data in this research to analyse the qualitative portion of data collected from the interviews, focus groups, and observation, the data analysis stage included usage of the statistical package software SPSS version 20.0 to analyse the quantitative portion of the data collected from the two surveys. The analysis of the quantitative data included:

- ✓ Organizing, classifying, and interpreting the collected data
- ✓ Representing the collected data in a graphic way for clear understanding of the data classification
- ✓ Performing confirmatory factor analysis to ensure reliability of the collected responses

5.9 Research Processes

The following table summarizes stages of the research process and highlights the research methods used in each stage.

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Table5.8: The research process

Stage	Research Theme	Tool/method
Stage 1: Critical Review of the Higher Education in the Gulf States	Research Problem Identification and Literature Review	Literature Review (Identifying Aim/Objectives)
Stage 2: Part1: Social Computing in Higher Education – tool review and best practices Part 2: Critical review of the technology acceptance theories	Literature Review	<ul style="list-style-type: none"> • Literature Review • Best practices
Stage 3: Defining methodology for data collection and analysis	Research Methodology	<ul style="list-style-type: none"> • Literature Review • Emerging theories
Stage 4: Part1: Exploring the use of SC in the case study institutions. (this include observing the factors that affect the use of SC in HE) Part2: proposing the research Hypotheses	Data Collection	<ul style="list-style-type: none"> • Literature Review • A Survey questionnaire will be conducted to collect information about the usage of the popular SC tools • Observation of the students’ use of the SC websites
Stage 5: Framework Development	Data Collection and Analysis	<ul style="list-style-type: none"> • Literature Review • Case Study Survey questionnaire to confirm the proposed framework factors
Stage 6: Prototype development and testing with end users and usability experts.	Data Analysis and validation	<ul style="list-style-type: none"> • Evolutionary prototyping process which includes testing with focus group of the end-users. • Heuristic Evaluation with usability experts
Stage 7: Testing with the IT experts to capture the implicit requirements for implementing the prototyped Online Course System (OCS)	Data Analysis and validation	Expert Evaluation of the prototyped interface and the proposed ICT Back-end needs
Stage 8: Pedagogic audit and verification	empirical Validation of the research findings	Demonstration in front of the focus group members who involved in stage 6 during the field work to get their reflection.

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5.9.1 Stage 1: Critical Review of HE in the Gulf States

In the first stage, a critical review of HE in the Gulf States is conducted in order to acquire knowledge about the real problems that face the HE institutions there and about the obstacles that confront these institutions in promoting student learning and improving the overall educational outcomes. This review includes a historical overview of HE in the Gulf region? How did it start? When were the universities established? Then it explores fourteen of the real problems faced by HE in the Gulf. This literature review leads to identifying the research problem and, consequently, formulating it in a generic way to identify the proper data gathering methods.

5.9.2 Stage 2, part 1: Social Computing—tool review

Stage 2 is mainly involves conducting a literature review of the relevant literature, research articles, and projects in order to acquire knowledge about SC applications and how they are being used in HE. It also extends to a critical review of technology acceptance theories, which will form the basis for studying the use of SC in the HE. During this stage, the literature review focuses on the definition of each available SC tool; how it can be used to consolidate student learning; what are the available best practices for using it in HE in the United States and Europe; and, from the educational perspective, what are the recommendations for using the tool to leverage the learning process. This literature review includes an overview of the benefits and opportunities of applying SC in HE with a summary of the literature regarding the potential benefits of that. Then the review moves to some strategies for pedagogical innovation in HE through the use of SC. After that, the review extends to the field of developing the educational organisation of the academic institutions using SC.

This stage fulfils the second objective of this research which is the identification of the potential impact of SC on the teaching and learning processes. Additionally, reviewing the best practices for using SC in HE helps in the stage of framework development because it highlights some thoughts on how students perceive the use of these tools in their daily learning activities and, consequently, fulfils the second objective of the research through understanding their mind-set when using it and defining the

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preferred and most frequently used tools. It also explores the most advantageous ways of implementing the technology, which consequently supports the prototyping stage as well.

5.9.3 Stage 2, Part Two: Critical Review of the Technology Acceptance Theories

In this stage, the literature review explores the available literature on technology acceptance theories. Nine of the most widely known theories and models of user acceptance of technology are reviewed with a deep discussion of the behaviour constructs in each theory. These theories were originally developed to measure some of the determinants of human behaviour regarding the use of new systems and tools (Al-Qaisi, 2007). The determinants are identified and summarized as a way of concluding the available research findings on the use of technology systems. One of these theories, the Unified Theory of Acceptance and Use of Technology (UTAUT), is introduced as the ninth model, and it already incorporates all of the proven research on the other models. So, UTAUT constructs are used in the data analysis stages as the core theory for the proposed constructs to describe the user acceptance of SC as educational technology and consequently to contribute in proving the validation of the final framework.

5.9.4 Stage 3: Definition of the Research Methodology

In this stage, the research methodology is described. It includes reviewing the literature of research methods that support social studies and e-Learning research. It starts by defining the research philosophy that defines the philosophical continuum of the research. Then the research approach, strategy, design, and tools/methods used to achieve the study goals and objectives are presented. Stage 3 includes the definition of the data collection and analysis methods used in this research. Finally, this stage includes the reliability and validity testing of the research with a summary of the considered ethical issues.

5.9.5 Stage 4: Skills audit of SC websites and factors that affect the use in HE

This stage comprises the main part of the data collection. A group of nine interviews with faculty members and students are conducted to collect information about using SC in their educational activities. Some countries, including UAE and Qatar, have begun to implement some of SC tools in their academic institutions. These initiatives

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have been in individual courses or by few instructors and students as a way of providing pilot work or as research projects. They have used some tools, mainly, wikis and blogs. Although they used these tools in an educational setting to serve mainly academic purposes; they focused on collaboration and most of the surveyed institutions missed grading student activities when using these tools. So, this stage is important because it addresses the second objective of exploring the students' interactions with SC tools.

According to definitions of the different styles of interviews in the data collection methods section, this stage is based on semi-structured interviews, which are conducted with faculty members and students in Gulf States' institutions.

After completing the interviews, some key interviewees with different roles, including students and faculty members, are nominated to be observed when using SC websites in separate sessions. During these observation sessions information about the user behaviour and preferences is collected. For example, it might be useful to understand whether the majority of social website users start the site surfing with reading notifications and announcements or by browsing others' input. This would help in defining a default course entry point for students which matches the majority of students' behaviour. This could help in bringing student attention to the most important content items or course events.

5.9.6 Stage 5: Framework Development

This stage aims to develop a framework that will help HE institutions to realize the potential benefits of using SC tools. For instance, this framework contains factors that should be considered when developing the new online course system, which adopts SC in HE. Other considerations will be covered in the framework in due time as a result of further literature review.

The main idea behind the framework development is derived from user acceptance theories. The technology acceptance model (TAM), theory of reasoned action (TRA), theory of planned behaviour (TPB), decomposed theory of planned behaviour (DTPB), motivational model (MM), unified theory of acceptance and use of technology (UTAUT), and an extension of the UTAUT model offered by Gunther et al (2009) play a key role in supporting the ideas that students and teachers will accept the usage of SC

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tools in order to gain better reputation, save time and effort through easier and faster codification, gain useful relationships with the other parties, ensure more privacy, and facilitate their study/work activities using SC tools. Gunther et al (2009) defined those benefits as the technology use-factors (namely reputation, codification effort, expected relationships, privacy concerns, collaborative norms, and signal-to-noise ratio) as extended constructs of the UTAUT model. The same constructs plus additional constructs will be added and tested in this research, namely the “communication benefits”. All the previous constructs are related to the main constructs of UTAUT: performance expectancy, effort expectancy, social influence, and facilitating conditions.

The UTAUT model aims to clarify user intentions when using information systems and related technologies in subsequent usage behaviour. The theory holds that the four key constructs (performance expectancy, effort expectancy, social influence, and facilitating conditions) are direct determinants of use intention and behaviour (Venkatesh et al., 2003). These four constructs depend on four factors: age, gender, experience, and voluntariness of use, which are posited to mediate the impact of the four key constructs on usage intention and behaviour (Venkatesh et al., 2003). In HE, all students are still learning and recently completed high school. So, they are all in the same age range and are expected to have comparable levels of experience. So these two variables will not make big difference in affecting the four main constructs of UTAUT and so that, they will be ignored in this research. Later, clarification will be provided.

In Chapter 6, each construct of the framework is discussed in detail with an explanation of each link. A set of hypotheses is presented and tested with users to, finally, yield in developing a framework for using SC in HE. Chapter 7 will highlight how the related constructs could be used in enhancing the e-Learning system design through prototyping a new online course system. The prototype focuses on using various SC tools in an effective way to improve collaboration between students and develop new course delivery methods. Such improvement proves successful instantiation of the framework constructs in the system prototype. Then a discussion of how such framework and system prototyping could solve the main problems that face HE in the Gulf will be introduced in Chapter 8 to measure the success of the proposed framework and prototype. This success will be the validation step of the prototype, which consequently validates the theoretical

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framework. The validation includes a literature review of user acceptance models and theories and the available best practices in the field of implementing SC in HE to help in avoiding the known issues and obstacles before prototyping the new system.

The main data collection step in this stage includes a survey questionnaire on the proposed framework factors. The survey deployment targets what the users will accept with regard to using SC in education. The survey results and comments lead to highlighting the user needs and preferences when using SC platforms. These needs and preferences will be recorded in preparation of the first draft of the system prototyping through the step of developing the prototype model. Rogers (2007) describes the paper prototype as a step in developing a new software or website that meets the user expectations and needs. It is a simple way of presenting models that provides a great deal of useful feedback to aid in developing a better design.

5.9.7 Stage 6: Prototype development of a new Online Course System (OCS)

In this stage, the system prototype will be developed and tested as a model for e-Learning systems. It employs SC tools in a way of supporting the teaching staff through enhancing the course delivery methods and support students to be highly engaged in their learning. This support comes through

1. A customizable learning environment that could be tailored to the student's interests and needs
2. Enabling useful collaboration and socialization tools
3. Well-organized content areas that match the user needs to be defined after performing the task analysis and usability testing of the new prototype

The system social tools help students to increase their awareness about the academic environment and about the courses they are registered for. Some of these tools support student learning through facilitating the following activities:

1. Communication with course instructors and other course members
2. Reflecting the new updates in course news, content materials, and student grades
3. Facilitating online collaboration with peers to discuss and share knowledge about course topics

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Rogers, Sharp, & Preece (2007) introduced the prototyping process in a number of stages, starting with defining the design objectives and paper prototyping. In a similar scenario, the prototype development process in this research starts by defining the objectives of the new design and why there is a real need to develop such a prototype. The second step is to highlight the situation of concern, then define a course of action to point out activities that could be done by users to benefit from the new system design. After that, a detailed user analysis is conducted to define the user profiles, categories, and exact needs. The new prototype should facilitate certain tasks to support users of the system to enhance the learning activities. These tasks are highlighted in a separate task analysis stage. The task analysis is followed by functional analysis and requirements analysis. These different types of analyses lead to a conceptual design of the different design elements, and then the initial paper prototype will be designed. The paper prototype will be supported by some design suggestions to help users to understand the new system functionalities and the design rationale. Finally, usability analysis will be conducted to confirm user acceptance and ease of use of the new course environment/system. In the case of design changes being needed, the paper prototype will be updated and a usability analysis will be conducted again to confirm the user acceptance again to the revised approach.

Some data collection about the use of the SC tools by students and instructors in order to define their exact needs and interests will be conducted. Understanding these needs will make it possible to brainstorm all of what is needed to be added to the course environment (on paper), then, using Photoshop. This will be the paper prototyping version. After that it will be useful to come back to the prototype and check the brainstormed thoughts and preliminary elements against the collected data and implement usability analysis with some students/instructors. Next, iterative testing with the pilot group will be conducted. After finalizing these iterations, heuristic evaluation of the prototype is planned to be conducted by an expert in human-computer interaction (HCI). It is expected that the expert evaluation will lead to better ideas that might improve the prototype. Figure 5-5 illustrates the prototype development process.

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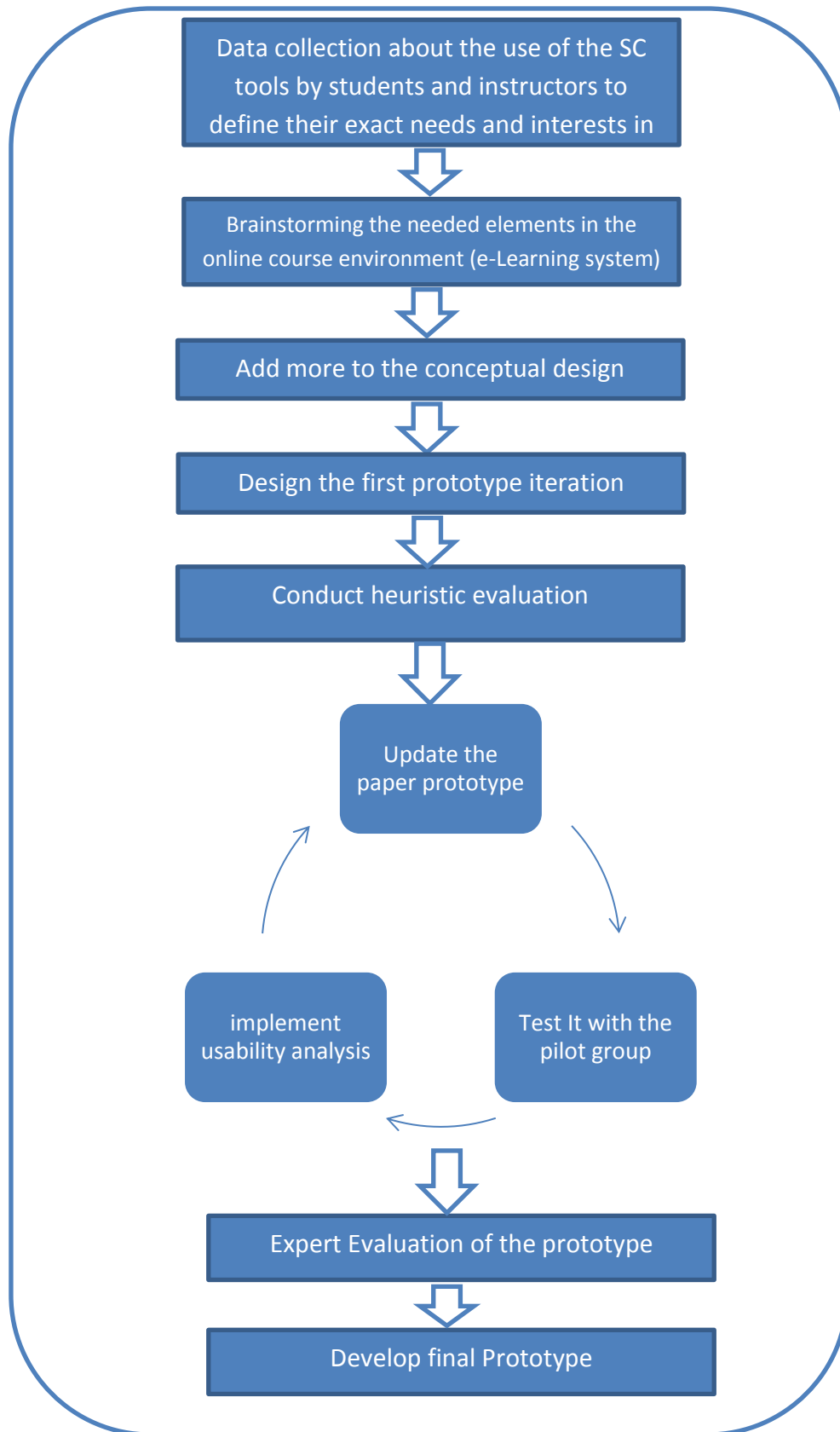


Figure 5-5: The process of prototyping the new online course system.

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5.9.8 Stage 7: Infrastructure and requirements for implementing the prototyped Online Course System (OCS)

The model delivery infrastructure and needs are defined during this stage. The new course system can be implemented using a multiconfiguration approach to serve small-, medium-, and large-scale institutions. Small-scale institutions are the institutions with total concurrent sessions less than or equal to 2,000, medium-scale institutions run up to 5,000 concurrent sessions, and large-scale institutions run more than 5,000 concurrent sessions. The number of concurrent sessions is calculated as per the number of users, number of courses, and number of full-time equivalents (FTEs). FTE indicates the workload of the student or instructor. The small-scale institutions can use single server implementation, which configures the web server, database server, and storage server on one server machine. Such a configuration helps small institutions to implement the system at a reasonable cost. Medium-scale institutions can be configured on two separate servers: one for application and web server and a second for database and storage. A larger system fits the need of large-scale universities or institutions. It utilizes a set of servers as application tier, another set of servers as database cluster, and a third tier for storage. The setup of the different tiers and the links between them are discussed in Chapter 7.

5.9.9 Stage 8: Pedagogic audit and validation

During this stage, the focus moves to ensure the credibility of the research findings and validating the proposed framework and prototype. Gill and Johnson (1997) pointed out that validity and reliability are common evaluation criteria for the credibility of research findings in the research methodology to justify its findings. A good practice in any research project is to provide enough information about the used methods plus justification for using such tools; this proves the credibility of its findings (Robson, 2004).

This stage includes an academic evaluation of the proposed system. A group of university professors is expected to pedagogically evaluate the prototype to ensure its validation and that it serves the expected outcomes. Semi-structured interviews will be conducted with faculty members and students to ensure that the new course system could

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serve as a proper online platform to facilitate content delivery, personal learning, socialization, and assessment in an easy way. The interview starts with an explanation of the interview objectives and the developed system prototype and a discussion of the methods used in the prototype evaluation. Questions focused on the pedagogy behind the content delivery and collaboration, validation of the proposed course system, and ways it could be applied to develop an effective e-Learning platform.

5.9.10 Stage 9: Conclusion

The ninth stage of this research puts summarises the results and makes recommendations for future work. This stage continues validating the research results through demonstration sessions in front of key faculty members from the group who contributed in Stages 4 and 6. They are chosen from the group that suggested enhancements and attended the prototype validation process.

5.10 Reliability and validity testing

The research validity is concerned with the truth of the research findings (Dooley, 1984). It refers to whether the identified research inputs actually produce the expected outputs and whether these outputs can be generalised beyond the immediate sample study (Robson, 2004). In fact, the research validity ensures research quality in any empirical research. Kidder and Judd (1986) summarised four tests that have been widely used in many research papers to establish the quality of the research. The four tests are relevant to the case studies. These tests are Construct Validity, Internal Validity, External Validity and Reliability. Some tactics have been identified for using these tests for case studies. Table 5-9 summarizes these common tests and tactics.

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Table5.9: The common validity tests with their relevant tactics

TEST	Case study tactic	Phase of research in which tactic occurs
Construct validity	<ul style="list-style-type: none"> • Use multiple sources of evidence • Establish chain of evidence • Have key informants review draft case study report 	Data collection Data collection Composition
Internal validity	<ul style="list-style-type: none"> • Do pattern matching • Do explanation building • Address rival explanations • Use logic models 	Data analysis Data analysis Data analysis Data analysis
External validity	<ul style="list-style-type: none"> • Use theory in single-case studies • Use replication logic in multiple-case studies 	Research design Research design
Reliability	<ul style="list-style-type: none"> • Use case study protocol • Develop case study database 	Data collection Data collection

The following summarizes how this research passes the four tests, applying the corresponding tactics.

5.10.1 Construct Validity

Yin (1989) described the function of the construct validity test as to identify correct operational measures for the studied concepts. The following sources of evidence have been highlighted by Yin (1989) for the “multiple sources of evidence” tactic to test the construct validity:

1. Interviews: Interviews with faculty members and students are also conducted in this research.
2. Direct observation: Direct observation of the student use of the SC sites is included in this research.
3. Participant-observation: Participant-observation conducted during the student’s observation stages.
4. Physical artefacts: Some artefacts were developed while conducting focus groups and prototyping the course model in the prototyping stage.

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Another tactic of the construct validity is the chain of evidence, which was defined by Yin (1989) as the links between the asked questions, collected data, and the drawn conclusions. This research passes this test because the proposed research questions were tested by SPSS for its correlation and validity to ensure covering the proposed research factors. The collected data was analysed then using a factor analysis approach to confirm construct validity. The Cronbach's alpha measure was also checked to ensure validity of the proposed survey questions in measuring the constructs under investigation. The drawn results were validated through instantiation of the developed framework, which was derived from the data analysis results.

5.10.2 Internal Validity

Internal validity identifies the true causes of the observed outcomes of the research study (Yin, 1989). In another wording, the independent variables of the research should be causally linked to the dependent variables. This indicates strong internal validity, which means strong justification of these links. In summary, internal validity involves causal control of the research variables.

In this research study, the studied independent variables included the technology acceptance factors, while the dependent variables are the successful implementation of SC in HE based on the user acceptance of SC technologies which is theorised by the conceptual framework for implementation. The framework represents an extension to UTAUT. It theorizes that, the pre-determinants of the UTAUT determinants can lead to the extended results after the UTAUT results. These prior determinants including the use of SC in HE and its links to the defined eight key acceptance factors, all are studied and validated in this research. In between the determinants and result, the other constructs are linked and validated by UTAUT.

5.10.3 External Validity

Yin (1989) defined the target of the external validity testing as establishing the domain in which the research findings can be generalised. Yin

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(1989) argued that in the case study research the investigator relies on analytical generalization in which he/she struggles to extend the research findings to some broader theory and achieves generalization.

To generalize the study findings, the theory should be tested in a second and possibly third neighbourhood and prove that it has the same results in the wider domain (Yin, 1989). This is ideal in multiple case study research such as this research which is studied in two case study institutions, one in UAE and another in Qatar. External validity is studied in detail in Chapter 8.

5.10.4 Reliability

Reliability means similar research outcomes should be obtained if the research were to be replicated (Hussey and Hussey, 1997). Considering this research, the HE problems in the Gulf States are clear and have been studied by many other researchers (Shaw, 1997), (Romani, 2009) and (Mahdi, 1997). The impact of SC on business is also studied and introduced in many other research papers including the research of Gunther et al (2009). It is highly expected that if any other researcher(s) applied the same research methods to investigate HE problems in Gulf States using SC, the research would result in similar findings.

5.11 Ethical Issues

Richards and Schwartz (2002) pointed out some fundamental ethical requirements of any research study. These requirements include:

- The particular research should result in tangible benefits, so it worth doing.
- The research study should be conducted by researchers with adequate levels of expertise.

From another side, McNamara (1994) highlighted five ethical concerns that should be considered when conducting any academic research, especially when collecting data from individuals. These five guidelines are

1. Voluntary participation. The research should ensure that all participation is completely voluntary. (A consent form has been submitted to every respondent that mentions clearly the ethical considerations including the

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voluntary participation. The research ethics panel in the research school approved the ethical evidences and forms.)

2. No harm to respondents. Any possible harm to the respondents must be avoided. This includes any embarrassment or uncomfortable feelings about the participation in interviews. Moreover, the researcher must ensure no harm in any research-related publications or data analysis. This research does not include any sensitive questions that might cause uncomfortable feelings or embarrassment for the respondents. All the deployed research methods included an introductory part and user agreement to ensure no harm to respondents and a desire to contribute to the research. Respondents were asked to feel free to not participate and to ask any question or freely communicate to the researcher if they have any doubt.
3. The researcher should ensure protection of the respondents' identity. So, anonymity and confidentiality must be ensured in all the forms of recordings and transcripts. The current research maintains anonymity of participants in all surveys and questionnaires and ensures confidentiality. No respondent can be identified on the basis of his/her response.
4. The researcher should disclose to respondents the purpose of interviews and which organisation is sponsoring them. This was explained clearly to respondents and interviewees before conducting sessions with them.
5. The methods and results of the research should be reported accurately. It is assumed that the researcher should report the weaknesses and problems that he or she experienced during research and any unbiased results of the study as well.

Ethical issues are considered to be essential evidence in demonstrating research credibility. It also plays a role in measuring the appropriateness of the research behaviour and relation with the subjects affected by the research (Saunders et al, 2000).

5.12 Summary of the Chapter

This chapter has introduced the various research approaches, strategies, methods and logic behind selecting these methods and approaches. The research design included

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the use of questionnaires, semi-structured interviews, observations, evaluations, evolutionary prototyping, and demonstration as research tools, with justification of why these tools were used. The research instruments are developed on a basis of literature and best practices review. The research methodology included both of the subjective and objective approaches. It leans toward inductive in terms of developing a model of using SC in HE but, on the other hand, reflects a deductive approach when it utilizes the available technology acceptance theories and their constructs to develop the final framework. The case study organisation is introduced as the primary research strategy to gather real data about HE and the usage of SC in the Gulf States. A process of nine stages was designed to show the research theme in each stage and the methods used to achieve it. Then the validity testing tactics were introduced to check the validity of the research findings and guarantee reliable research outcomes. Finally the ethical considerations were summarized to highlight the important ethical concerns in the academic research.

Chapter 6

Data Analysis and interpretation

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6.1.Introduction

This chapter presents the collected data in a way of analyzing the characteristics of SC users and their use of SC in HE in the Gulf States. This data will be analysed to extract the most important factors that play major role in the user acceptance of SC in HE, and encourage or discourage them to use SC tools for facilitating the learning and teaching processes. Then it goes through deep analysis of each surveyed factor with analysis of the collected results to end by developing new framework which works as theoretical base for implementing SC in the HE in the Gulf States.

The first step of the data collection included deployment of Survey questionnaire and interviews with students and instructors from HE institutions in United Arab Emirates and Qatar, plus observation sessions of the user activities when using the SC websites at all. The second step included another Survey Questionnaire and interviews with group of nominated users from the first step sample plus group of the management staff and student observers. After this stage and based on the analysis of the collected data plus literature review of the user acceptance of technology, a new framework for implementing SC in the HE institutions will be proposed. The framework provides conceptual model of how SC can leverage the teaching and learning processes. To deploy the conceptual framework, chapter 7 includes evolutionary system prototyping of suggested new online course system in which SC tools will be exploited. This stage includes expert evaluation of the suggested design and interviews with students and instructors to confirm the user acceptance.

The first step's survey, interviews and observations target the definition of the user background and his/her use of SC services, the user awareness about the known SC services, level of experience in using these services' websites, the frequent social activities that the user does on these websites, topics he/she looks for in the SC websites, benefits of using them, drawbacks, values when using these websites, impacts of using these sites, the user's social tendency and the mostly used social services of these websites.

The second survey (in stage 2) has been built on the base of the collected background from the first survey and user interviews which focus on observing the use of the SC services by the students and instructors in HE. The researcher nominated group of

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the surveyed and interviewed users and communicated them in the second survey about the factors that might affect the usage of SC in HE. The nominated group was chosen based on their experience of using SC websites and the number of hours they spend in using Internet in their life at all. The nominated group included 85 per cent of the first survey respondents, typically the top ranked users of SC websites and who have enough experience in using internet and web-based services.

Both surveys were offered in dual language, English and Arabic, to make it easier for the users to understand exactly what is required. Both of the two survey questionnaires are included in appendix 3 of this thesis. The majority of the surveyed users are Arab students. Some of them are studying subjects offered in Arabic Language especially in some colleges like College of Law, College of Education and College of Islamic Studies and Arabic language. Some users are already using the SC websites and have many posts in Arabic language. So, some of them preferred to have the surveys in Arabic. As mentioned in chapter 5 (the Research methodology Chapter) that the translation was conducted by an accredited bilingual staff. Then the Arabic version was translated again back to English and compared the new English version with the original one to ensure the validity of the translation process. The comparison resulted in minor variations that do not affect the overall meaning of the offered questions.

6.2.Data collection Part 1: Usage of SC in educational context in the case study institutions

This part includes presentation of the collected data about the usage of SC in general and in HE. It starts by listing and discussing the quantitative part through a descriptive analysis of the collected responses on the first questionnaire. Then it goes through the analysis of the qualitative part of data through interpretive analysis of the conducted interviews with the instructors and students.

6.2.1. Descriptive analysis of the collected data by the first applied survey questionnaire (Quantitative data part)

The description of the surveyed sample enabled the researcher to develop comprehensive view of the respondent profiles and evaluate to check if any further treatments like re-categorization are required.

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Based on the sample characteristics, including the experience of using internet and social networking services, two samples were elected from the United Arab Emirates University in UAE – Al Ain City and Aspire Academy for Sports Excellence in Qatar – Doha City. Each sample is located in different state in the Gulf area and this was chosen to ensure diversity of culture characteristics. Both of the two samples included all the user categories (students, teaching staff, management staff and student observers). These categories can be described as follow:

- 1. Students:** this sample included randomly chosen undergraduate and graduate students from the UAE University and Aspire Academy in Qatar.
- 2. Instructors/Teaching staff:** this sample included randomly chosen lecturers from Aspire Academy in Doha - Qatar and UAE University in Al Ain -UAE.
- 3. Non-teaching and Management staff:** this sample included randomly chosen staff from the administrative departments of Aspire Academy and UAE University.
- 4. Observers:** this sample included individuals who observe the students, chosen irrespective of relationships and industries. Individuals include parents, guardians, relatives.. etc. who have the basic understanding of the popular SC tools.

The data collection stage included 2 surveys, 9 interviews, 2 focus group discussions and 5 observation sessions. A total of 914 questionnaires in two surveys were answered completely by participants across the two institutions. This includes 588 students, 199 instructors, 78 management staff and 49 observers. Total of 520 respondents answered the first survey and 394 respondents answered the second one.

The descriptive analysis of the applied research instrument revealed the characteristics of the surveyed sample in terms of:

- IT background and years of experience in using web technologies.
- Culture and country of origin.
- Experience in using the SC tools and technologies.
- Demographics.

Prior to analysis, the survey responses were examined using the SPSS statistical software for accuracy of data entry, missing values, normality and outliers. Routine

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descriptive statistics procedures were carried out using the descriptive analysis tools in SPSS. The missing data were below 5 per cent of the collected answers. So, they were replaced by the mode value (Schumacker & Lomax, 2004; Hair et al., 2006). The findings of these statistics are presented next to the four user samples.

The following bullets list the collected data statistics and representation to highlight important characteristics of the surveyed sample in the side of using SC services. The level of experience in using Internet and computer showed that the two samples are using Internet more than 10 hours per week (97 per cent of the surveyed users). Most of them (98 per cent) have email accounts and (75 per cent) use Internet since more than one year ago.

- The demographic analysis of the two samples showed that, in the first survey there was 72 percent of male and 28 percent of female respondents (represented in Figure 6-1), while in the second one, there was 72.59 per cent of male respondents and 27.41 per cent was female, which is almost the same ratio.

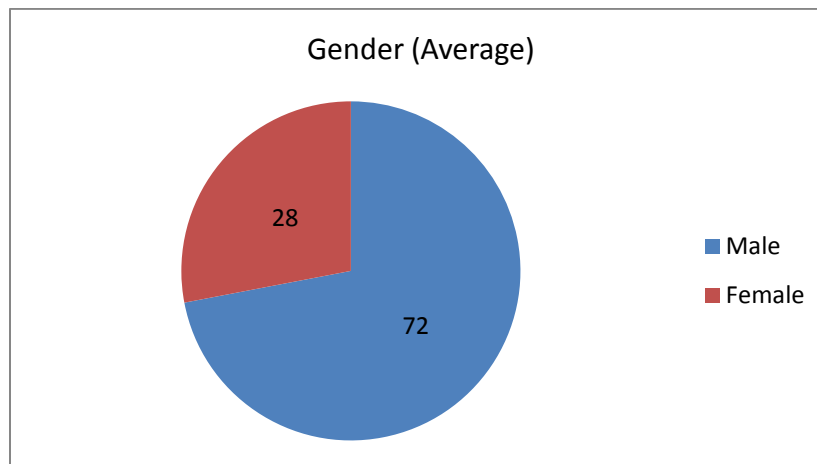


Figure 6-1: Respondents by Gender

- The surveyed samples included 433 respondents from United Arab Emirates (UAE), 318 from Qatar, 39 from Oman, 12 from Bahrain and 107 from other countries outside the Gulf States. This means 84.9 per cent are Gulf citizens and 15.1 per cent are from other nationalities but living in Gulf either to study or to

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work in the Gulf States. So, all the sample members are aware of the Gulf States' culture norms. The two ratios are represented in Figure 6-2.

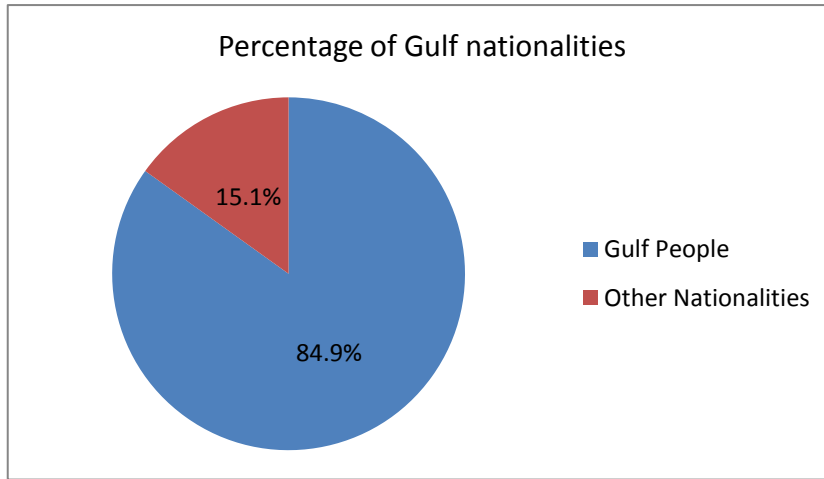


Figure 6-2: Respondents by Nationality

- When using SC websites, 'chatting with other members' was recorded as the top online activity by the survey respondents (67 per cent). This ratio reflects the high tendency of the university level students and staff to socialize most of time and keep communicating with their peers. The next common four activities included 'Browsing Profiles' with 58 per cent and 'Reading comments on profiles' with the same ratio. The third rank for the online user activities between the surveyed samples was 'Updating my Profile' with 57 per cent followed by the 'commenting on profiles' activity with 49 per cent, and 'search for new contacts' with 45 per cent. These statistics plus statistics about the other surveyed online activities are represented in Figure 6-3.

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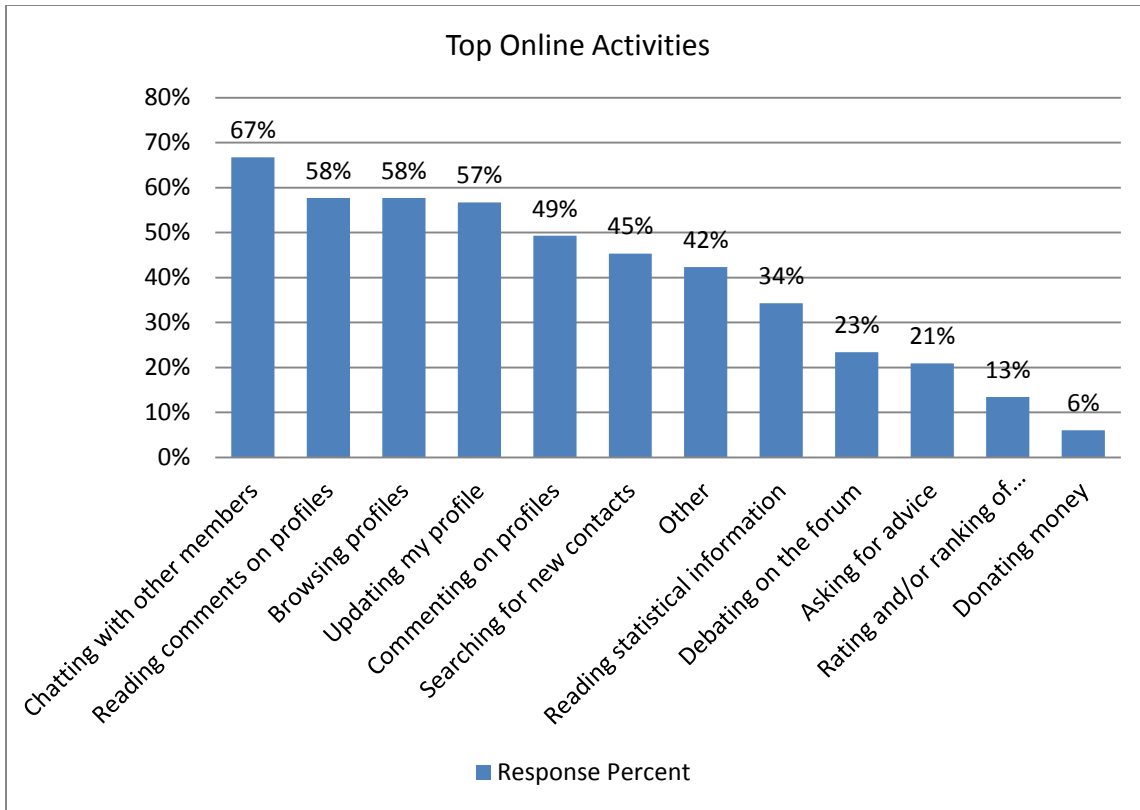


Figure 6-3: Top Online activities used by the respondents

- Many of respondents (72.9 per cent of them) agreed on the top three engaging topics when logging to the social networking sites to be ‘Access online content (like Audio, video or text files)’, ‘Send Notifications or instant messaging’ with 61.5 per cent ratio, and ‘Developing the online user profiles’ with 45.8 per cent. The top two ratios show clear desire to exploit the social networks in getting access to online content and communicate with other colleagues. The results about the engaging topics are represented in Table 6-1

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Table 6-1: the top three engaging topics

What are the top 3 topics are engaged with on the website ?		
Answer Options	Response Percent	Response Count
Access online content (like Audio, video or text files)	72.90%	348
Send Notifications or instant messaging	61.50%	293
Developing online user profiles	45.80%	218
Other	38.50%	184
Building online blogs, wikis or discussion forums	31.30%	149
Bookmarking / Tagging services	22.40%	107
<i>answered question</i>		477
<i>skipped question</i>		11

Figure 6-4 below illustrates these stats graphically.

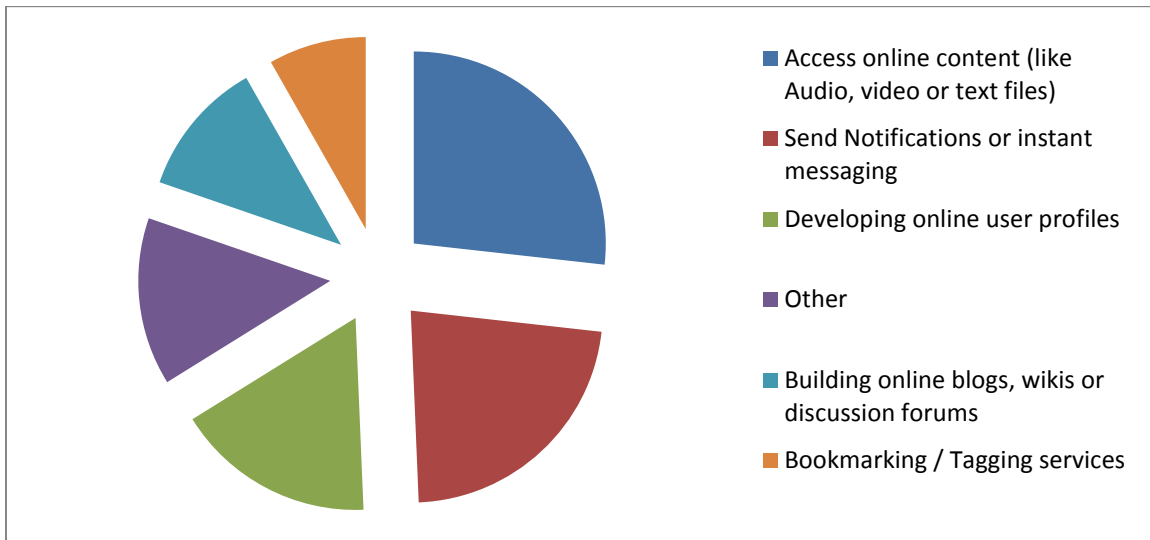


Figure 6-4: the top engaging topics

- The survey included list of benefits that might be gained from accessing the SC websites and asked the sample members to nominate the top five of them. The top five ranks included ‘Learning experience’, ‘Having fun’, ‘Developing knowledge about people’, ‘Meeting people with similar experiences’ and ‘Content exchange’ which all are related in somehow to the learning experience and socialization. These results show clearly the user tendency to learn and socialize while learning using the social networking services. The ranks of these benefits are shown in Table 6-2.

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Table 6-2: Benefits from using SC services

Benefit	Percent	Count
Learning experience	69%	337
Having fun	58%	282
Helps me develop my knowledge about people/things	57%	277
Meeting people with similar experiences	56%	272
Content exchange	51%	246
Keeps me informed with updates about people or interesting matters	49%	237
Making new friends	46%	226
Greater understanding of some topics through member posts or exchanging information with a friend	40%	196
Valuable tips	36%	176
Support and encouragement	27%	131
Other	23%	111
Personal advice from community members	18%	85

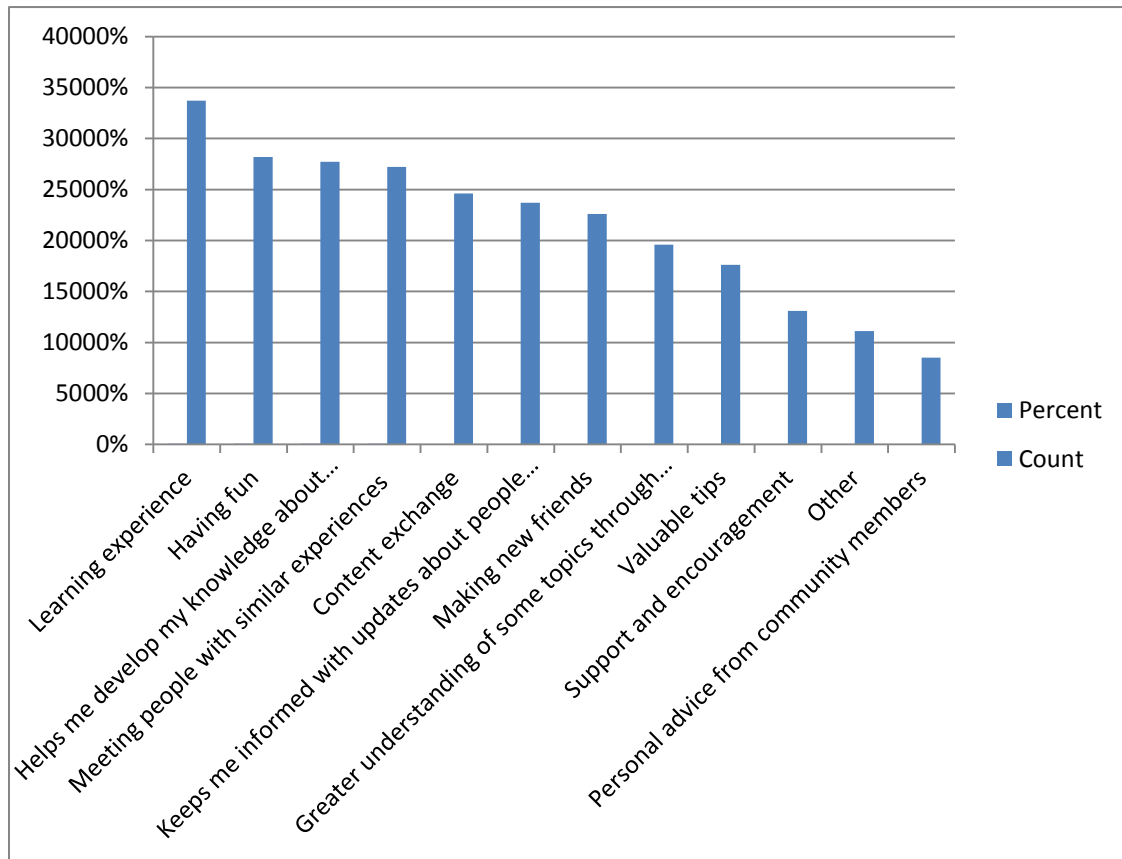


Figure 6-5: Benefits from using SC services

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- On the other hand, the drawbacks of accessing SC websites were surveyed and the collected responses reflected high concern of privacy, security of information and reliability of information. The collected answers are grouped and ranked in table 6-3.

Table 6-3: Drawbacks from using SC services

Drawback	Percent	Count
Risk of privacy; open access to my personal information	78%	381
Unwanted contacts	62%	300
Spam/inappropriate comments	59%	290
Reliability of information is limited	52%	254
Impact of joining the community on learning is limited	48%	234
Domination of small number of peers / opinions	38%	183
Peer pressure	38%	183
Intimidation/harassment	37%	178
Other	37%	178

Figure 6-6 below illustrates these stats graphically.

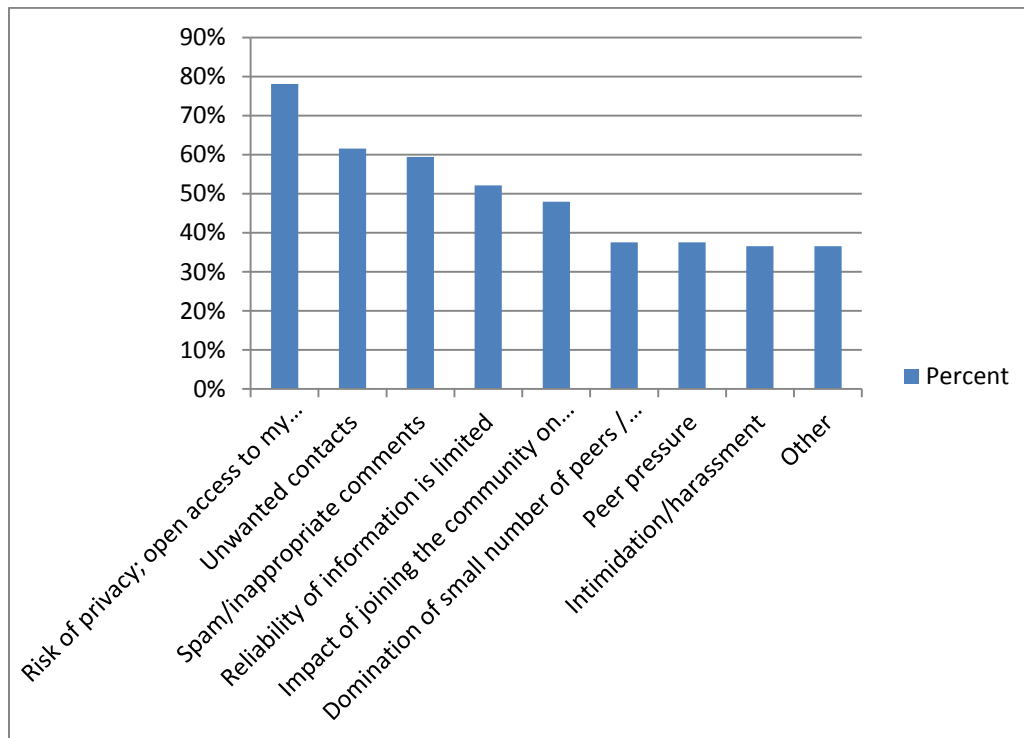


Figure 6-6: Drawbacks from using SC services

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- The most important 5 impacts of using SC websites were selected from list of impacts which have been ranked as shown in Table 6-4.

Table 6-4: Impacts of using SC services

Impact	Percent	Count
It added to my learning resources	65%	317
I have made new friends	62%	301
I enhanced my communication and networking skills	57%	280
I gained new collaboration platform(s)	54%	265
Improvement of my life communication skills	52%	254
I changed my learning styles	50%	244
My opinion on my learning resources has changed	36%	177
My outlook learning styles has changed	31%	151
I have less contact with some of my offline friends	21%	104

Figure 6-7 below illustrates these stats graphically.

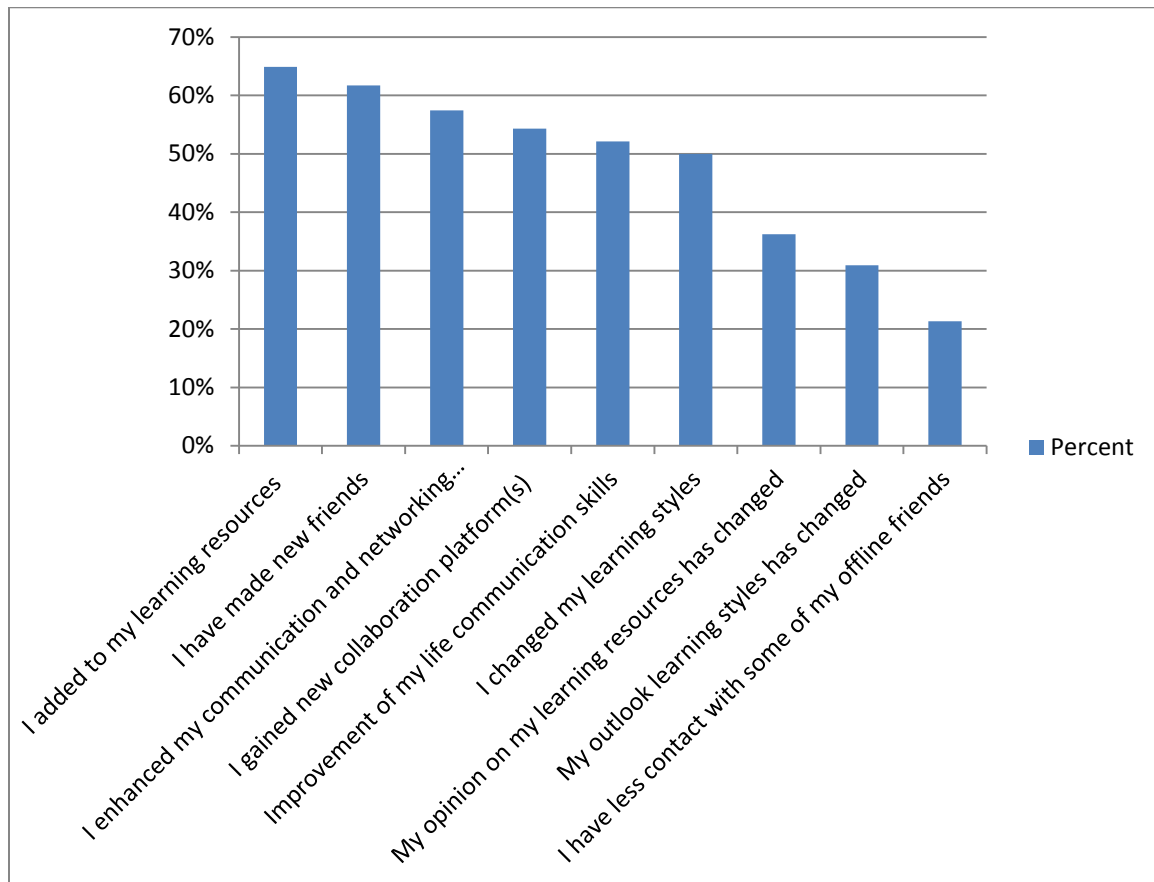


Figure 6-7: Impacts of using SC services

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- To confirm the cultural effect on using SC, the surveyed samples were asked to nominate the top five values that associate with the SC websites. The result was as shown in Table 6-5.

Table 6-5: Values considered when using SC services

Value	Percent	Count
Openness	52%	254
Sharing	45%	219
Respect	39%	188
Diversity	37%	178
Community sense	35%	173
Informality	35%	173
Self-support	35%	173
Professionalism	34%	168
Expertise	33%	163
Equality	32%	158
Confidentiality	19%	92
Security	19%	92
Other	19%	92
Engagement	16%	76
Acceptation	15%	71
Law compliance	14%	66
Recognition	13%	61
Tolerance	13%	61
Cohesiveness	13%	61
Reciprocity	12%	56
Solidarity	10%	51
Conviction	10%	51
Integrity	10%	51
Empathy	9%	46
Dedication	8%	41
Formality	6%	31
Empowerment	5%	25
Righteousness	4%	20

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Figure 6-8 below illustrates these stats graphically.

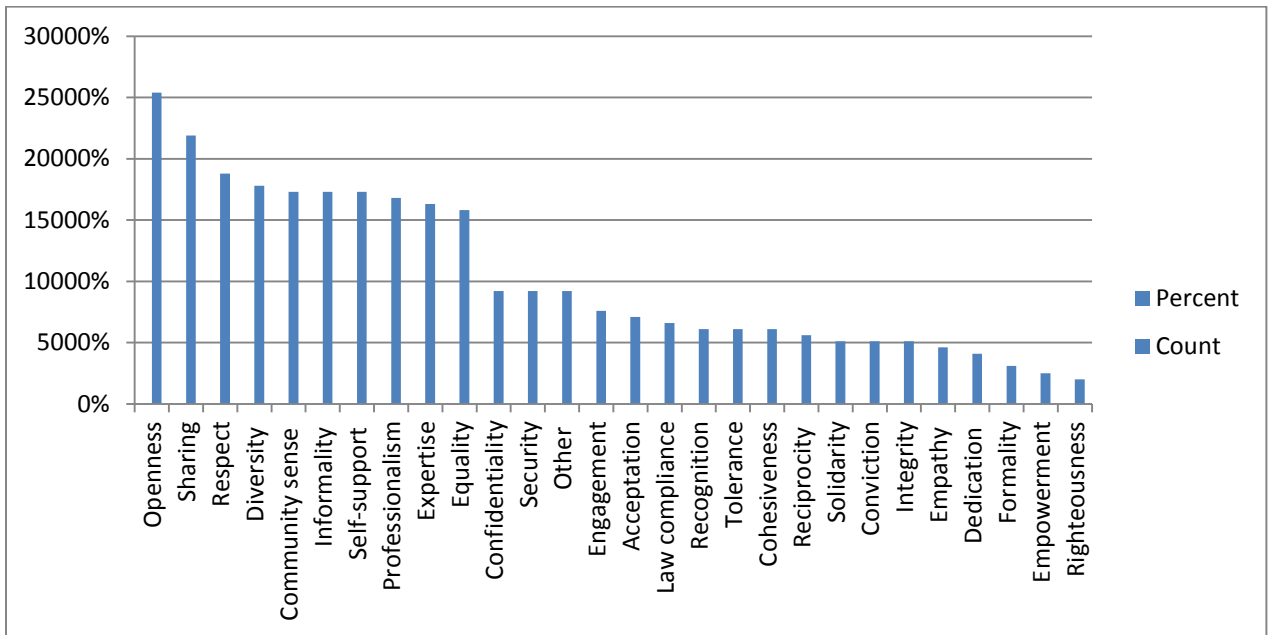


Figure 6-8: Values considered when using SC services

- Between the different SC functionalities, the mostly used three functionalities of SC services by the surveyed sample members were ‘Chat boxes’, ‘Forums’ and ‘Wikis’ as shown in Table 6-6.

Table 6-6: The mostly used functionalities of SC services

Functionality	Percent	Count
Chat box	49.2%	240
Forum	46.2%	225
Wiki	41.1%	201
Blog	39.6%	193
Upload photos/videos	33.0%	161
Other	31.5%	154
Voting tool	24.9%	122
Rating tool	18.3%	89
Map	15.7%	77
Tagging tool	14.2%	69

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Figure 6-9 below illustrates these stats graphically.

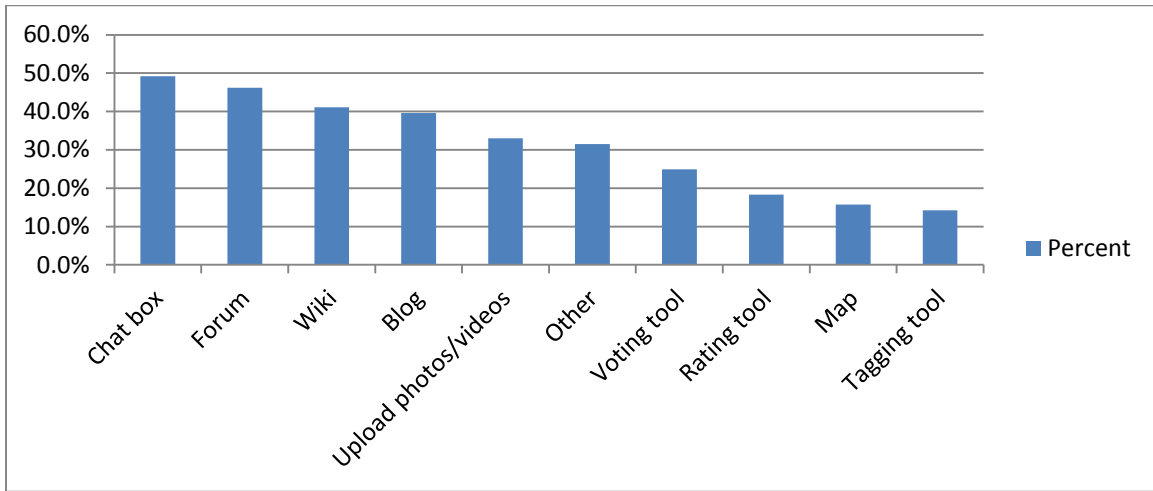


Figure 6-9: The mostly used functionalities of SC services

An essay question about recommendations for enhancing the SC websites services reported the following suggestions:

- More social activities that support the educational motivation are required.
- The search tools in the SC websites especially for learning content could be enhanced to facilitate the research activities on these sites.
- The online content of the SC websites needs enhancement through compressing it into more light weight packages. So, faster browsing and downloads are there.
- Extending the SC to integrate with the educational websites domain.
- Adding more gaming content.
- All social networks should be free services.
- More enhanced security and privacy.
- Integrity matters a lot these days and should be considered in the newer versions.
- More educational oriented Communities can be developed.
- Smoother video calling is required.

Many of the user answers reflect their interest in learning using SC services. As shown above, most of the answers included some words or ideas related to facilitating the access to content, enhancing the content itself, developing new integration between the

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education websites and social networks, keep working on enhancing security of content and privacy of users and developing the technical side of these websites to be more effective in learning and education at all. These concerns reflect the user care of developing the social websites to serve more in learning and socialization.

6.2.2. Analysis of observation sessions (interpretive analysis of the qualitative data part)

The student observations reflected high interest of students to socialize and network through the social websites. Many of them use the social websites for getting learning materials including pictures and videos. Some others keep themselves updated about the surround world through social networks and RSS feed news. They also use social networks for gaming and fun.

In the case study institution, Aspire Academy for Sports Excellence, the observation sessions included 81 students. Seventy three of them (92% of the observed students) use “Flickr” as main resource of pictures of matches and sports athletes. Some instructors assign them homework activities which require evidences by photos. For example, it was noticed that the ‘Sports Culture’ and ‘Sports Psychology’ subjects always include assignments in which students use Wikipedia, Flickr, Slideshare and YouTube to find related learning materials. All the observed students (81 students) have online profiles on Facebook with rich content of videos and photos of their contributions in matches, champions and tournaments. It also includes personal information, achievements and performance reports online. They like to share such information about themselves with their instructors, colleagues, coaches and other athletes around the world.

In the second case study organisation, United Arab Emirates University, the observation included 69 students. 41 of them from the College of Engineering (COE) who use the virtual worlds on Secondlife to get ready made models and learn 3D modeling. On the other side, 20 Students from College of Business and Economics liked the available presentations online on Slideshare and presentation tube. All of them submit course work supported with presentations from Slideshare. They see it useful resource for learning some study-related concepts. Computer labs in the Center for Teaching and Learning Technologies (CTLT) were also noticed busy with many students who socialize

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with their peers at the break times using Facebook, chatting rooms, and some other SC platforms.

The observation setting focused on nine of them who showed high acceptance of SC at the student side. They are always interested in the frequent updates about their learning and see it easy to learn in continuous engaging environment.

6.2.3. Interview analysis (interpretive analysis of the qualitative data part)

To guarantee deep understanding of the benefits SC might have in developing the teaching and learning processes in the HE in the Gulf States, group of 20 students and 15 instructors were interviewed in semi-structured interviews. The interviews were conducted in the United Arab Emirates University with 10 students (7 of them are females and 3 are male students) and 6 instructors; and in Aspire Academy with 10 students (all are male students) and 9 instructors. The first part of each interview included some pre-prepared open-end questions about the definition of SC, the available SC tools/services on the internet, the proper use of each tool/services, the gained benefits and the possible drawback of using SC in the HE in the Gulf States and the values that should be considered when implementing SC in HE in the Gulf States.

The second part included open discussion on the use of SC in HE in Gulf and if it can benefits all the stakeholders of HE in Gulf. Some questions were developed on the base of the collected answers in the first part of the interview (the structured part). And some questions were derived and based on the available practices of using SC in the other businesses. The general feedback on the interviews included the following noticeable points:

- The majority of instructors in both institutions (14 out of 15), especially those who come from Europe and the Western countries are already familiar with the concepts and functionalities of SC and, up to certain extend, use it in their class work.
- Some of the interviewed female students (four of them) had some considerations from their side about the use of SC between male and female students. Six of the seven females preferred using avatars and nick names to express themselves.

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- Between the whole students in both institutions, 13 students are new to certain SC services like the Tagging services, online office applications, and the virtual worlds' services.
- Most of students (16 out of 20) concerned the Privacy, Reliability of the SC tools and security of their information.

During interviews with students and instructors, similar concerns like what were collected from the survey responses were also collected. Around 93 percent of the instructors (13 out of 15) reported that they are already using the social networks in work-related activities to keep communicating with people from similar backgrounds and experiences. They talked about colleagues from other universities who work in the same field of academia and have useful posts and uploads in their profiles on the social networks. They expressed interest in communication with their students through the social websites and some of them mentioned about the importance of using these websites in academia to use and develop student portfolios for assessments and projects. All instructors (100 per cent of the interviewed instructors) talked about the collaboration with their colleagues and students through the social networking websites like Facebook.

6.3.Data collection Part 2: The key factors of acceptance for using SC in HE in the Gulf States

As introduced in chapter 5, the following factors have been highlighted as key factors for measuring the user acceptance of using SC in educational context. Each factor was either newly constructed (like 'Communication Benefits') or constructed from the UTAUT model (like 'Facilitating Conditions'). The following bullets summarize the definition of each factor to and how it is offered in this research.

- Reputation:** Donath (2001) defined the reputation of a person or group of people as an opinion or by another meaning a social evaluation of that person or group based on a set of criteria. It is considered as an entity for identification of that person or group.
- Expected Relationships:** It can be defined as the extent to which individuals believe that they can improve relationships with others using SC. SC on its own implies interactions and relationships among individuals.

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- iii. **Communication Benefits:** SC replaces ‘conversations at the cooler’, email and phone. Improving such communication via SC may lead to less email, less phone calls, less IM and less meetings. On commenting the communication through the SC platforms, Gunther et al (2009) correctly state that “this means less interruptions of the employee’s work flow and more time for task performance”.
- iv. **Signal-to-Noise Ratio:** this factor was introduced in chapter 5 with definition of Signal-to-Noise ration as the amount of useful signals that can be transmitted through a medium as compared to the noise in the environment. Individuals in organisations are coping with a lot of noise in terms of email, phone, IM, etc.
- v. **Codification Effort:** Signal-to-Noise Ratio has a friend in affecting the use on SC services which is the Codification Effort factor, both of which would negatively impact the adoption process of SC. The rationale behind SC is frequent updates. This would require efforts from the employees who have to share this time with their daily tasks (Orlikowski, 1993).
- vi. **Privacy Concerns:** As summarized in chatpter5, security of communication would be the primary concern when sharing of private information is concerned.
- vii. **Collaborative Norms:** As introduced in chapter 5, ‘Collaborative Norms’ is about the extent to which an individual believes that others feel that it is important for the individual to use the system. Gunther et al (2009) claim that ‘Collaborative Norms’ is shown as more informal than the social influence. This perspective helps in developing more informal communication between people involved in the social system. Such informal communication can result in the desire to learn and the desire to conduct research and development.
- viii. **Facilitating Conditions:** This factor is extracted from UATUT as key moderator of the user acceptance of using SC in HE. So, as explained in chapter 4 of this thesis, Facilitating Conditions (FC) *is the degree to which individuals believe that an organisational and technical infrastructure exists to support use of the system*. Based on the literature, when both performance expectancy and effort expectancy constructs are present, facilitating conditions become insignificant; and consistent with TPB/DTPB, facilitating conditions are also direct antecedents of usage (an attribute found also in MPUC). This effect is expected to increase with experience in using

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technology as users find multiple avenues for help and support. Hence, the influence of facilitating conditions on usage is hypothesized to be moderated by age and experience; such an effect would be stronger for older workers, particularly with increased experience.

In this research paper, the research focus is on, specifically, HE, where the age and experience of the majority of users are almost similar and semi equal. The majority of users are students from age 19 to 23 who already work together and easily transfer their knowledge and experience in-between. So, the age and experience will be ignored as real modifiers of the user acceptance. This makes the used constructs of the UTAUT model to be re-depicted as shown in figure 6-10.

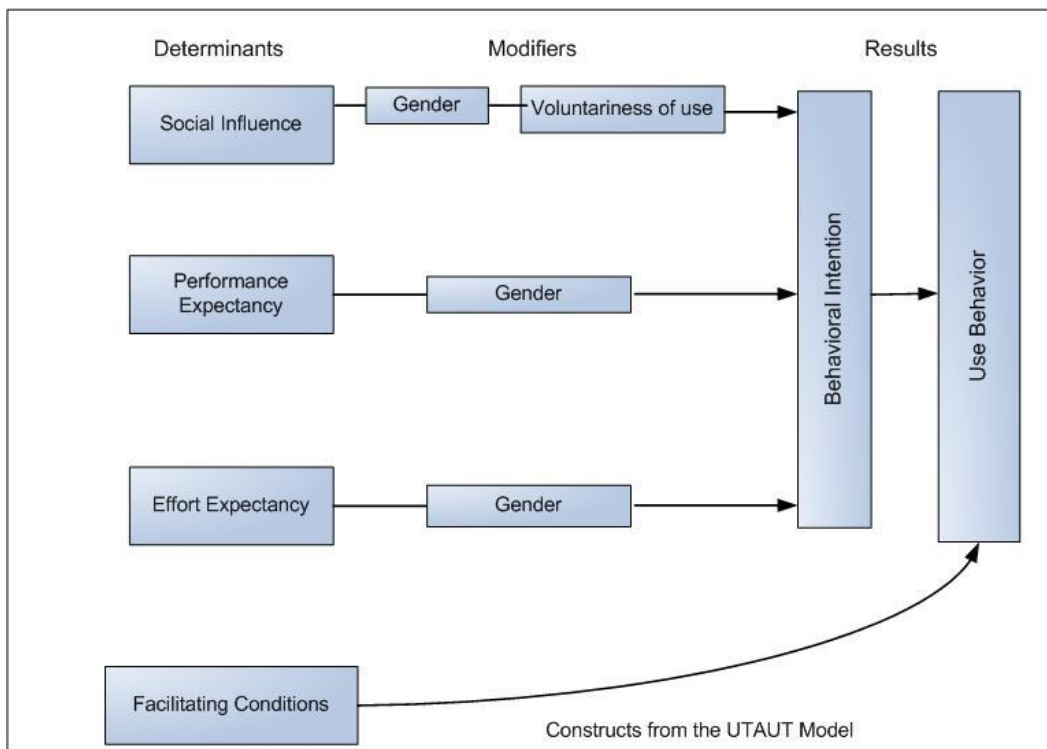


Figure 6-10: UTAUT after eliminating the age and experience modifiers

In order to analyse the user acceptance, the above eight factors were studied through proposing set of initial hypotheses, testing these hypotheses with the users by conducting survey questionnaires and user interviews, and analyzing the collected data to summarize the findings and set out the key factors that affect the user acceptance of using SC in HE.

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In this stage, the data collection included a survey questionnaire that was answered by a total of 389 participants across the two HE institutions in Qatar and UAE. This included 249 students, 52 instructors, 39 management staff, and 49 observers. The survey was designed and disseminated as online survey questionnaire and respondents were communicated via online means such as emails and face to face gatherings too. The respondents were from different HE institutions and included students, instructors, administrative staff, and observers. Respondents were identified to cover all grade levels, different majors, and different Gulf State nationalities.

6.4. Research Hypotheses

Based on the collected data from the first questionnaire and the observation sessions on the usage of SC in HE in the case study institutions and the interests of the users to use SC in their learning activities, it has been thought that users will accept the use of SC in HE. Also, since the observations consolidate the approach to hypothesize, it makes sense in this research to propose group of hypotheses and study them to confirm the user acceptance of using SC in HE. However, to which extend SC will be implemented and used successfully in HE, this will be studied based on these hypotheses in order to ideally implement SC in HE in the Gulf States and guarantee successful outcomes on the teaching and learning processes.

As per the technology acceptance theories introduced in chapter 4, the user acceptance of any technology is measured by the behavioural intention which leads to use behaviour. The UTAUT model proposed the ‘Performance Expectancy’, ‘Effort Expectancy’ and ‘Social Influence’ as three constructs which affect the behavioural intention and consequently the use behaviour. It included the ‘Gender’ and ‘Voluntariness of use’ as moderators of the mentioned three constructs.

In their research, the following factors are defined as determinants of the ‘Performance Expectancy’:

1. Privacy Concerns
2. Reputation
3. Signal-to-Noise Ratio
4. Codification effort

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5. Expected Relationships
6. Communication Benefits
7. Collaborative Norms
8. Facilitating Conditions

From the literature review, it was noticed that Gunther et al (2009) have studied six of these factors to test user acceptance of using Microblogging in business. The same six factors of Gunther's study plus the 'Communication benefits' and 'Facilitating conditions' are proposed in this study to be determinants of the user acceptance of using SC in HE. So, the total factors that will be studied/re-studied in this research with focus on the use of SC in HE in the Gulf States are the mentioned above eight factors. The link between the use of SC in HE and each factor is introduced with hypotheses on how it will be related to the performance expectancy, effort Expectancy and the Social Influence constructs. These three constructs affect the behavioural intention and consequently develop certain use behaviour as proved by the UTAUT theory. These hypotheses will be, then, tested in the second survey and interviews within the case study institutions with group of Students, Instructors, Administrative staff and student parents/observers.

- i. **Reputation:** A lot of contradicting studies have been done on the factor of reputation or image (used synonymously). Kankanhalli, Tan & Wei (2005) state that reputation from knowledge contribution has no influence on contribution Behaviour. Donath (1999) mentions that exact opposite i.e. reputation is a significant predictor of individual knowledge contribution. Blau (1964) generalised his hypothesis about the people engagement in social interactions to that they mainly seek for approval, status or respect. These three requirements reflect directly on the image or reputation of individuals. The findings from Gunther et al (2009) state that reputation is positively related to performance expectancy (to attain gains in job performance). They also suggest that individuals make deliberate efforts to engage in social interactions in search of approval and reputation and hence the positive relationship between reputation and intention. In this study, it is hypothesized that:

H1: a strong link between using SC in HE and gaining a more positive reputation for the user in his or her community,

H2: the better reputation affects the performance expectancy positively, and

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H3: the better reputation increases the Behavioural intention to use SC in HE

- ii. **Expected Relationships:** The obvious fact from SC is that knowing the right person to be in touch with is very important. Another important angle is of Socialization which refers to the process of inheriting norms, customs and ideologies. Expected Relationships can also be termed as socialization.

In universities and Academic institutions, students always look for developing useful relationships with their colleagues, professors and the other community members (Janasz and Sullivan, 2001). Usually, such relationships become more beneficial when its members exchange thoughts, ideas, learning materials, and many other benefits in terms of what can mentioned for the university students. Actually these students are already starting building their first steps of life experience through collaborations with the other parties. From the theoretical and technological perspectives, SC platforms expand beyond the social information processing to emphasize social intelligence as well (Wang, 2007). In fact, implementing SC in Academia helps students in developing more relationships with their colleagues and professors through its collaboration features and communication benefits. Therefore, in this study, it is hypothesized that:

H4: a strong link between using SC in HE and gaining beneficial relationships for the user in his or her community,

H5: the expected relationships affect the performance expectancy positively, and

H6: the expected relationships increase the Behavioural intention to use SC in HE.

- iii. **Communication Benefits:** When focusing on HE, it becomes more valuable to facilitate the communication and collaboration around learning. Considering HE, meeting of minds comes at its core, and SC definitely has potential impact on facilitating the meeting of minds regardless of bringing the bodies together. So, Communication between the different parties using SC platforms had has a high potential impact on enhancing the student learning in HE.

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In HE, SC helps all the university stakeholders in communicating each other from one side and the university itself from the other side. As instance, Faculty members could communicate their students easily through online notifications using microblogging tools like Twitter. Students could communicate each other or their professors in similar way or through posting on a blog or wiki. The university could communicate its stakeholders through online wikis or RSS feeds with the university news. All these examples reflect how SC facilitates communication in the academic environment and consequently promote the student engagement and awareness. In this study, it is hypothesized that:

H7: a strong link between using SC in HE and gaining Communication Benefits of that,

H8: the Communication Benefits is directly linked to the performance expectancy, and

H9: the Communication Benefits is directly linked to the ‘Social Influence’.

- iv. **Signal-to-Noise Ratio:** Status updates from SC Applications and requests to update information on an existing Wiki are just examples of more noise that the employees may have to encounter. With SC Applications in place, instead of receiving 20 emails a day, employees may receive 200 tweets a day (Gonzalez and Mark, 2004).

In Educational Context, these frequent updates mean keeping the student engaged in the different educational activities. Keeping students always updated with discussion entries, wiki and blog updates, new content uploads, assessment grades, course notifications and institutional announcements; all are useful examples of how to keep the student engaged and kept updated with the news and events related to their study. In the academic environment, the Signal-to-Noise ratio is highly expected to be very high and more than 1:1 because the noise itself refers to the frequent updates from the third parties; while, in the academic environment, all the noise is already related to education and university activities, which all support the student learning, engagement and awareness. So, it can be rightfully hypothesized that:

H10: a Direct link between using SC in HE and increased ratio of Signal-to-Noise (i.e. Signal > Noise),

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H11: the Signal-to-Noise ratio is inversely related to the effort expectancy, and

H12: the Signal-to-Noise ratio is directly related to the performance expectancy (weak link).

- v. **Codification Effort:** SC tools can actually be a better means of communication as compared to IM, email or phone calls. Considering the informality of communication with SC, codification effort will be reduced to a certain extent. Employees, in general, would find the process of continuous updates tedious as it would affect their task performance.

When spotting that on the academic environment, it will be little different. The continuous updates represent a learning facility and/or awareness of content changes. So, it will not be that tedious for students to receive multiple course notifications or university news because all are concerned with student issues and student learning support. On the other hand, the codification effort is low in most of the SC environments. For example, one of the great advantages of blogging and microblogging using platforms like Twitter or Jaiku, is their flexibility to exchange quick texts, URLs, audio and video links in flat text quickly with no time for formatting or adjusting syntax. So, the codification effort goes low and made it easier for students to exchange information and notifications easily and quickly. In terms of course content, it keep the students informed with updates and may be able to contribute in collaboration using their hand devices and mobile phones, which means more engagement and custom learning. In this study of SC, it can be hypothesized that:

H13: an inverse link between using SC in HE and spending more codification effort,

H14: the codification effort is inversely linked to the performance expectancy (weak link), and

H15: the codification effort is directly linked to the effort expectancy (logical hypothesis).

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- vi. **Privacy Concerns:** Real example of the privacy concerns factor can be given when Facebook came under a lot of security when users realized that they could not delete accounts they did not wish others to view. They could deactivate accounts but they still stayed on the Facebook servers. Facebook eventually changed this policy but this privacy concern had created a lot of concerns for its users. In the organisational context, employees privacy concerns would be about the level of control management would have over them with the implementation of SC. In an environment where continuous learning takes place, ensuring the security of such content will be the standing pillars based on which knowledge owners will collaborate with each other. The experiment conducted by Gunther et al (2009) suggests that employees “associate negative utility with such self-disclosure”.

When spotting this suggestion in the academic environment with condition of implementing SC under the umbrella of the implemented Learning Management System (LMS), or the university educational portal, that disclosure will be controlled by the student himself/herself using his university account credentials. So, students could contribute in online social activities using their accounts or anonymously as per the pre-configured environment by their course instructor. For example, a wiki for biology course might be created by the course instructor to help students expressing their thoughts and understanding about the course topic(s). Then they might use their student IDs/accounts to add posts and develop threads. So, using SC within the e-learning system could reduce the student privacy concerns, and consequently raise the intention to use. So, in this research on using SC in HE, it is hypothesized that:

H16: using SC in HE is linked to the privacy concerns. i.e. the users of SC in HE are concerned with privacy, and

H17: the privacy concerns are inversely linked to the behavioural intention (weak link). i.e. the more privacy concerns leads to less behavioural intention to use SC in HE.

- vii. **Collaborative Norms:** SC encourages individuals to express themselves. As per the definition of the collaborative norms, and considering the reflection of using SC on reputation, the student reputation will play the key role in firing the students’

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collaborative norms and consequently affecting their Behavioural intention. So, it can be hypothesized that:

H18: *using SC in HE is linked to the collaborative norms. i.e. the users of SC in HE are concerned with what the others expect from them, and*

H19: *the ‘collaborative norms’ is directly linked to the Behavioural intention. i.e. the more collaborative norms the user gains the more Behavioural intention to use SC in HE.*

H20: *‘collaborative norms’ is directly linked to ‘social influence’.*

- viii. **Facilitating Conditions:** This factor is perhaps the one that individuals would not think of during the inception of the new technology, but they would realize the impact on usability aspects of technology. In the experiment conducted by Gunther et al (2009), they figured out that employees in the tested organisation did not want to move to another application to update Twitter. The tool must be integrated tightly with the existing infrastructure. Factors like flexible budgets and the requirement of strong information assets are an integral part of the facilitating conditions.

In Academia, using SC in HE gives more flexibility for students to access the learning resources and keep engaged in their learning easily. It also facilitates communication between students and professors. It helps in delivering assignments and exchanging content as well. Frequent updates is one of the SC benefits. All these factors are facilitating tools to make learning easier and more engaging. Students usually concern the facilitation as they like quick responses which needs setup facilities. As per the life style of their age at all, HE students like to have all are ready, then they contribute in collaboration activities and add useful inputs. This means that strong Facilitating Conditions are required for the right behavioural intention to use. So, it can be hypothesized that:

H21: *using SC in HE is linked to the facilitating conditions, and*

H22: *the facilitating conditions are directly linked to the Behavioural intention.*

To sum up, these hypotheses consider the approved links by UTAUT as general base for using any technology. For example, if UTAUT hypothesizes strong link

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between the performance expectancy of the user when using certain technology and his/her behavioural intention, the same hypothesis continues with using SC as one of these technologies. I.e. as summarized before, all the links between the UTAUT constructs continue as they are in UTAUT when applying them in using SC in HE in the Gulf States. The outcomes of these hypotheses extends to additional hypotheses which link between the use behaviour, as result of all the UTAUT links, to better teaching styles, more individual and group learning activities, and enhanced assessment strategies; which all result in better student learning. So, when spotting the study of UTAUT on using SC in HE, the use behaviour is expected to reflect on the teaching styles, collaboration, individual learning activities and assessments, which all can be considered as extended results of the proved results of UTAUT. These reflections are represented in figures 6.14 to 6.21 by links between the use behaviour and the extended results. The following sections include testing these hypotheses in the case study institutions.

6.5.Data analysis part 2: the collected data on the technology use-factors

In this part, the collected data about the acceptance of using SC in HE in the Gulf states is analysed and discussed. It includes the analysis of the collected quantitative data through the second survey questionnaire plus the analysis of the qualitative part of data which was collected from the interviews.

6.5.1 Results from the second questionnaire: Analysis of the use-factors (Quantitative data part)

The second survey questionnaire was answered by 389 respondents. It included set of questions on every use factor of the hypothesized factors in this research either the factor was newly constructed or constructed from the UTAUT model. The following table displays the factor-question relationship. For instance, questions 3.1,3.2 and 3.3 were offered to collect user opinions about the significance of “reputation” as a usage factor. Similarly, questions 4.1,4.2 and 4.3 were offered to collect user opinions about the significance of “expected relationships” as a usage factor. The survey was offered in e-

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form using survey web service with randomization capability which helped in offering the questions in random order for each respondent. The survey is included in appendix 3 of this thesis.

Table 6-7: Hypothesized Factors – Related Questions

Use Factor	Related questions
REPUTATION	Questions 3.1,3.2,3.3
EXPECTED RELATIONSHIPS	Question 4.1,4.2,4.3
COMMUNICATION BENEFITS	Question 5.1,5.2,5.3
SIGNAL-TO-NOISE RATIO	Questions 6.1,6.2,6.3
CODIFICATION EFFORT	Questions 7.1,7.2,7.3
PRIVACY CONCERNS	Questions 8.1,8.2
COLLABORATIVE NORMS	Questions 9.1,9.2,9.3
FACILITATING CONDITIONS	Questions 10.1,10.2

Every question in the survey had 5 options of likert scale for the respondent to choose from. Each of these options was assigned a value shown as follows:

Table 6-8: Survey measures

Strongly Agree	5
Agree	4
Neutral	3
Disagree	2
Strongly Disagree	1

The data entry of this survey also passed some statistical pre-analysis procedures using SPSS to ensure the accuracy of the data entry process. As done with Survey1, the survey responses were examined against the missing values, normality and outliers. The routine descriptive statistics procedures in SPSS showed that the missing data were below

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5 per cent only of the collected answers. So, they were replaced by the mode value (Schumacker & Lomax, 2004; Hair et al., 2006).

The initial version of the second survey was altered many times and translated to Arabic to ensure easy understanding of its questions, and check if some questions can be reduced or merged together. The survey included group of questions per each use factor. For example, For each factor, the offered questions were titled Reputation1, Reputation2, Reputation3, Facilitating Conditions1, Facilitating Conditions2, and Facilitating Conditions3, where Reputation1 means the first question on the “Reputation” factor, which is defined as question 3.1. Similarly, question 3.2 represents Reputation2 and so forth. To ensure that the offered questions test the targeted factors, ‘Factor Analysis’ has been conducted using the statistics package software SPSS version 20. The factor analysis ensures that the offered survey questions are classified properly on the studied factors. It eliminates the redundant factors to generate the minimum number of factors or as called by SPSS, ‘components’. The factor analysis was performed using SPSS version 20.0, with manual definition of the required factors to be eight factors (as per the no. of factors under research). After eliminating the small values, the analysed question (or as called by SPSS, ‘components’) showed the highest factorization results as shown on table 6-9. It shows acceptable factorization statistics based on the question categorization in the survey. For example, Question 3.1 and Question 3.2 about ‘Reputation’ came under one component/factor, which means both of the questions are measuring one shared factor, which is the ‘Reputation’ in this research. This result ensures that Q3.1 & Q3.2’ answers express the respondents’ opinions on Reputation and consequently confirm that reliable data is collected to test the hypothesis based on it.

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Table 6-9: Factor Analysis – Rotated Matrix

Question / Dimension	Factor/Component							
	1	2	3	4	5	6	7	8
Reputation1	.630							
Reputation2	.811							
Reputation3	.673							
Expected Relationships1							.767	
Expected Relationships2							.666	
Expected Relationships3						.651		
Communication Benefits1								.712
Communication Benefits2								.643
Communication Benefits3								.580
Signal To Noise1			.874					
Signal To Noise2			.784					
Signal To Noise3							.569	
Codification Effort1						.865		
Codification Effort2						.603		
Codification Effort3			.821					
Privacy Concerns1		.874						
Privacy Concerns2		.804						
Collaborative Norms1				.742				
Collaborative Norms2				.749				
Collaborative Norms3					.721			
Facilitating Conditions1								.741
Facilitating Conditions2					.856			

After this stage of data accuracy testing, the final results were processed again by SPSS to check its internal consistency using the Cronbach's Alpha measure on the tested hypotheses' questions/dimensions. As defined by Gliem & Gliem (2003), Cronbach's alpha is a coefficient of reliability. In statistics, Cronbach's Alpha is used to measure the reliability or the internal consistency of a psychometric test score for a group of examinees. Gliem & Gliem (2003) claims that a reliability coefficient of .70 or higher as per Cronbach's Alpha is considered as "acceptable" in the social science research testing. In the collected data analysis, the SPSS calculations generated value of 89.5% of Cronbach's Alpha which reflects, as per the definition of Cronbach's Alpha test meaning, high level of reliability of the collected data.

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Table 6-10: Cronbach's Alpha coefficient

Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.895	.907	22

To confirm the reliability for all the proposed dimensions, Reliability testing was conducted by checking the “Cronbach's Alpha if item deleted”. The result is shown in table 6-10A below. It shows accepted levels of reliability for the survey questions after eliminating the irregular components.

Table 6-10A: Cronbach's Alpha if item deleted

Item-Total Statistics					
Question /Dimension	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Reputation1	30.66	85.426	.686	.660	.885
Reputation2	30.62	86.437	.607	.559	.887
Expected Relationships1	30.54	85.781	.635	.555	.886
Expected Relationships2	29.76	87.812	.419	.505	.894
Communication Benefits1	30.59	86.234	.603	.529	.887
Communication Benefits3	30.46	83.722	.705	.654	.883
Signal To Noise1	29.34	90.522	.192	.522	.807
Signal To Noise2	30.41	85.383	.630	.538	.886
Codification Effort1	30.29	85.258	.571	.405	.888
Codification Effort2	30.37	83.987	.676	.559	.884
Privacy Concerns1	30.48	84.677	.677	.650	.884
Privacy Concerns2	29.53	90.782	.185	.548	.807
Collaborative Norms2	30.39	83.283	.688	.590	.884
Collaborative Norms3	30.35	82.869	.717	.671	.882
Facilitating Conditions1	30.44	85.197	.699	.543	.884
Facilitating Conditions2	30.31	85.959	.617	.475	.887

The next step of data analysis included testing the correlation between the different questions to ensure correlation between the different variable dimensions. The

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results of correlation confirmed strong links between the different questions of the same variable. Six questions released correlation of less than 0.5 with their measured factors; so they were eliminated from the correlation table but considered as measures for the factor itself with representation as weak links. Table 6-11 below shows the correlation testing results.

Table 6-11: Correlation testing results

Question / Dimension	Reputation1	Reputation2	Expected Relationships1	Expected Relationships2	Communication Benefits1	Communication Benefits3	Signal To Noise1	Signal To Noise2	Codification Effort1	Codification Effort2	Privacy Concerns1	Privacy Concerns2	Collaborative Norms2	Collaborative Norms3	Facilitating Conditions1	Facilitating Conditions2
Reputation1	1.00	.610	.597	.507	.029	.463	.459	.553	.647	-.054	.211	.609	.637	.555	.604	.351
Reputation2		1.00	.567	.558	-.028	.521	.410	.488	.391	-.033	.175	.471	.515	.576	.467	.390
Expected Relationships1			1.00	.592	-.001	.571	.379	.534	.499	.022	.153	.520	.511	.468	.494	.515
Expected Relationships2				1.00	-.097	.581	.347	.573	.419	.035	.136	.561	.504	.560	.426	.430
Communication Benefits1					1.00	.623	.119	-.015	.081	.639	.583	.004	.014	.011	.166	.180
Communication Benefits3						1.00	.372	.549	.409	.085	.155	.532	.561	.526	.516	.421
Signal To Noise1							1.00	.659	.554	.031	.290	.425	.516	.484	.459	.316
Signal To Noise2								1.00	-.047	.034	.143	.581	.605	.634	.530	.450
Codification Effort1									1.00	.582	.616	.618	.692	.636	.549	.416
Codification Effort2										1.00	.580	.013	-.044	-.017	.104	.238
Privacy Concerns1											1.00	.655	.180	.179	.316	.317
Privacy Concerns2												1.00	.645	.624	.539	.506
Collaborative Norms2													1.00	.714	.582	.441
Collaborative Norms3														1.00	.514	.478
Facilitating Conditions1															1.00	.513
Facilitating Conditions2																1.00

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The correlation numbers in Table 6-11 prove that the different questions on the same factors successfully test the factor. For instance, there is a correlation level of 0.659 (65.9%) between “Signal to Noise1” and “Signal to Noise2.” Similar findings are between the other factors’ questions.

Using SPSS, custom table have been developed to express the whole dimensions based on the survey measures illustrated above (table 6-8). Table 6-12 below shows the results:

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Table 6-12: The whole dimensions based on the survey measures

Survey measure → Question/Dimension ↓	5 (Strongly Agree)		4 (Agree)		3 (Neutral)		2 (Disagree)		1 (Strongly Disagree)	
	Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %
Reputation1	275	55.70%	131	26.50%	80	16.20%	4	0.80%	4	0.80%
Reputation2	254	52.20%	144	29.60%	74	15.20%	17	2.10%	5	1.00%
Reputation3	272	55%	109	22%	40	8%	59	12%	15	3%
Expected Relationships1	326	66%	128	26%	30	6%	0	0%	10	2%
Expected Relationships2	228	46.50%	165	33.70%	83	16.90%	9	1.00%	9	1.80%
Expected Relationships3	257	52%	148	30%	49	10%	20	4%	20	4%
Communication Benefits1	296	60%	138	28%	49	10%	10	2%	0	0%
Communication Benefits2	247	50.20%	158	32.10%	68	13.80%	13	2.20%	8	1.60%
Communication Benefits3	272	55%	138	28%	30	6%	49	10%	5	1%
Signal To Noise1	104	21.20%	83	16.90%	98	20.00%	160	32.60%	49	9.40%
Signal To Noise2	242	49.00%	173	35.00%	64	13.00%	5	1.00%	10	2.00%
Signal To Noise3	44	9%	79	16%	222	45%	109	22%	40	8%
Codification Effort1	184	37.20%	169	34.20%	98	19.80%	33	6.70%	10	2.00%
Codification Effort2	199	41.10%	155	30.00%	113	23.30%	20	4.10%	7	1.40%
Codification Effort3	178	36.00%	99	20.00%	128	26.00%	59	12.00%	30	6.00%
Privacy Concerns1	107	21.70%	116	23.50%	115	23.30%	110	22.30%	46	9.30%
Privacy Concerns2	111	22.70%	88	18.00%	226	45.20%	58	11.90%	11	2.20%
Collaborative Norms1	219	44.20%	130	26.20%	122	24.60%	13	2.60%	10	2.40%
Collaborative Norms2	200	40.50%	150	30.40%	119	24.10%	12	2.40%	13	2.60%
Collaborative Norms3	153	31.00%	221	44.70%	106	21.50%	1	0.20%	13	2.60%
Facilitating Conditions1	197	39.80%	189	38.20%	96	19.40%	8	1.80%	4	0.80%
Facilitating Conditions2	69	14.00%	122	24.70%	156	31.50%	110	22.20%	38	7.60%

The results in Table 6-12 show the level of agreement between the respondents on each factor significance level in affecting the user acceptance of using SC in HE. For example, 275 (55.7%) of respondents strongly agreed on ‘reputation’ as an important

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factor in accepting SC in HE. While 131 (26.5%) agreed on that, 80 (16.2%) were neutral, 4 (0.8%) disagreed, and 4 (0.8%) strongly disagreed. To make it easier for comparing the levels of agreement for the different factors, Figure 6-11 illustrates the presented answers in table 6-12 (by hypothesis) and summarized by factor in figure 6-12.

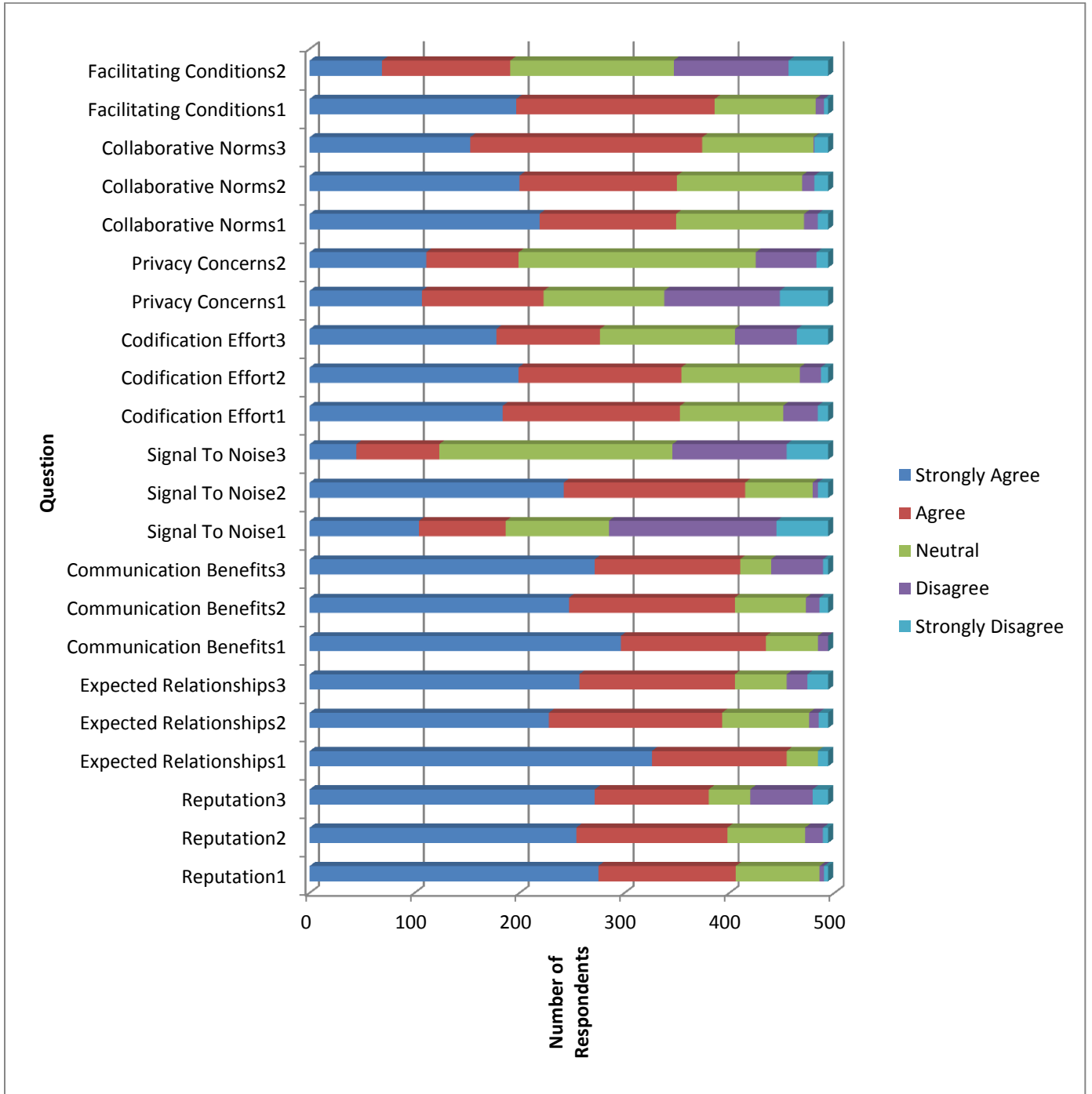


Figure 6-11: The whole dimensions based on the factor questions

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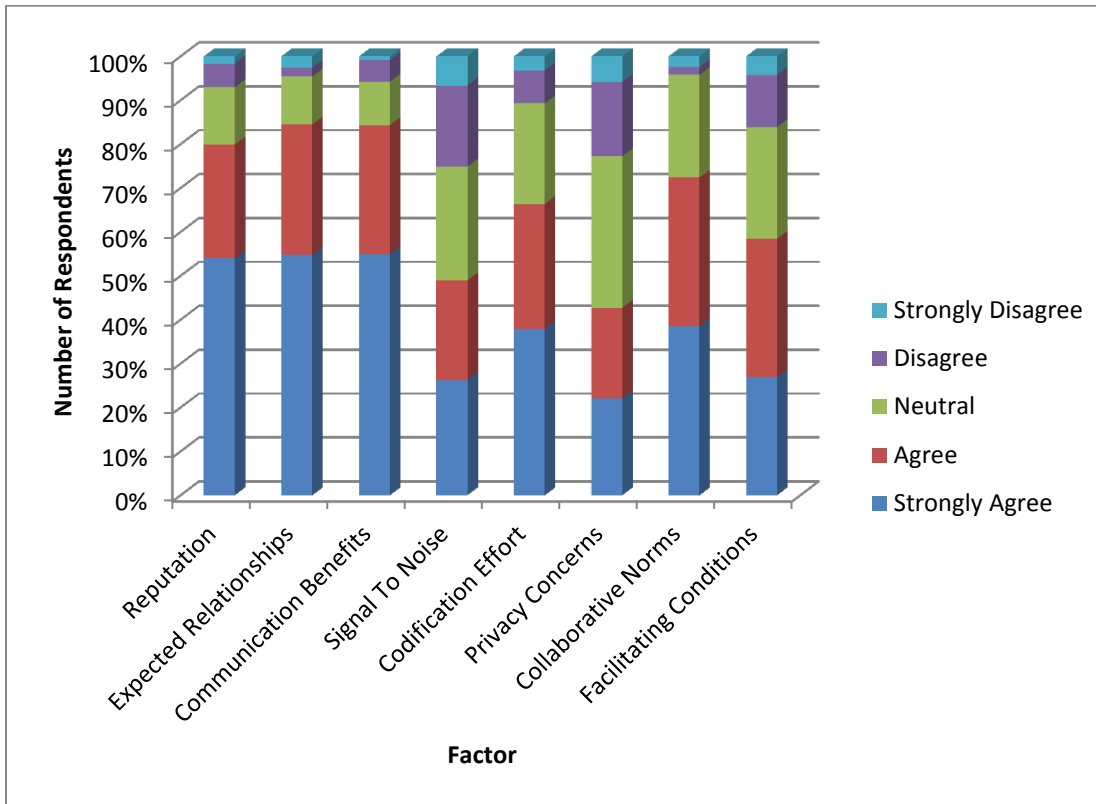


Figure 6-12: The whole dimensions grouped by factor

Table 6-13 illustrates the results from the analysis of all the received responses regarding the factors that affect user acceptance of using SC in HE, grouped by user category. To analyse these results, two variables will be used in the analysis of the collected data, “Optimism” and “Mode”. Psychologists define ‘Optimism’ as mental attitude that interprets any given situation on its best (optimum) case/status (Camerer & Lovallo, 1999). In this study the percentage of optimism defines the average of the extent to which individuals agree with a particular statement in the questionnaire. The possible optimism levels in the given answers are expressed by the “Strongly Agree” and “Agree” answers.

Cheng (1995) defined the “Mode” of group of values as the value that occurred the most number of times. In table 6-13, the mode identifies the response that received the most number of times. It was observed that all responses were consistent across all the surveyed samples (students, instructors, staff, and observers).

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Table 6-13: Factor analysis- part1

Question	Factors	Students (253)		Instructors (114)		Management (78)		Observers (49)		Average Optimism
		Optimism	Mode	Optimism	Mode	Optimism	Mode	Optimism	Mode	
3.1	Reputation	84%	4	90%	5	92%	4	88%	5	89%
3.2		78%	5	88%	5	86%	4	88%	5	85%
3.3		86%	5	84%	4	83%	4	74%	4	82%
4.1	Expected Relationships	88%	5	84%	5	80%	4	92%	5	86%
4.2		84%	4	84%	5	76%	4	82%	4	82%
4.3		74%	5	80%	5	82%	4	88%	4	81%
5.1	Communication Benefits	84%	5	88%	5	84%	4	88%	5	86%
5.2		80%	4	82%	5	86%	4	82%	4	83%
5.3		88%	4	76%	4	78%	4	74%	4	79%
6.1	Signal to Noise Ratio	94%	5	90%	5	94%	4	88%	5	92%
6.2		88%	4	92%	5	90%	4	94%	5	91%
6.3		33%	2	28%	3	25%	2	29%	2	29%
7.1	Codification Effort	82%	5	88%	5	80%	4	90%	3	85%
7.2		72%	3	76%	3	64%	4	66%	3	70%
7.3		88%	5	84%	4	84%	4	82%	4	85%
8.1	Privacy Concerns	65%	5	60%	5	75%	4	52%	3	63%
8.2		68%	3	84%	3	84%	3	50%	4	72%
9.1	Collaborative Norms	84%	5	88%	5	84%	4	88%	5	86%
9.2		82%	5	90%	4	80%	4	82%	4	84%
9.3		79%	4	92%	5	76%	5	71%	3	80%
10.1	Facilitating Conditions	24%	3	24 %	2	26%	2	22%	4	24%
10.2		28%	3	22%	2	30%	1	28%	3	27%

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6.5.2 Interview analysis (interpretive analysis of the qualitative data part of the use-factors)

To analyse the real reasons of accepting using SC in HE, nine interviews with 6 students and 3 instructors have been conducted. These students and instructors were nominated based on their clear understanding of the usage of the different SC tools in business and their familiarity with most of these platforms. The first part of each interview included some pre-prepared open-end questions about the factors that might affect the usage of SC in HE. The second part included open discussion on the UTAUT theory constructs and the psychological factors which might affect the usage of SC in HE in the Gulf States with consideration of the dominating culture norms in these countries. The interview included discussions about the classification of the Gulf States' culture and if such classification applies for the current youth generations; especially the university students who are familiar with SC and keep socializing almost all the time. Some questions were developed on the base of the collected answers in the first part of the interview (the structured part). Interview recordings are included in the attached DVD to this thesis. Appendix 5 refers to that too. The general feedback on the interviews included the following noticeable points:

- All users agreed on that the better reputation/image will motivate students to work more and more on increasing that image through more use of the SC technologies. It seemed as stimulator for students who always like to keep engaged with others and might feel leading their groups in that field.
- When talking about the 'Privacy Concerns', all of instructors see it as vital to keep their private information and the students' information as well secured and far from any harmful attacks. Especially for girls who already have bad impression about keeping some private information like contact information online and think that means others can hack them in some way. On the other hand, the male students expressed lower care about privacy. They consider the educational community will not have that important information about them. But when discussing the possible side effects, they express higher care about privacy in their learning.

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- The interviews included discussion about the requirements to successfully implement SC in HE in the Gulf States and the discussion around that reflected the following findings:
 - Proper communication infrastructure is required for high speed access to the internet for all the community members any time.
 - Mobile devices can facilitate higher engagement rates. All the students should be able to configure connections to the university network and services.
 - Reliable HW and SW are required to ensure high availability of the computer systems which facilitate the implementation of the SC in HE.
 - Security frameworks and systems should be in place to support extending the SC services to more course content, assessment and other critical information. Privacy can be higher with better security systems.
 - Technical expertise still required to handle such integration between the different SC platforms and the existent university systems.
 - Cloud storage might be required to serve as shared network storage system and be accessible be mobile devices.
- All the nine users agreed that the more benefits the user gain from using SC in HE, the better performance expectations from him/her. Two instructors argued that the higher performance expectancy is one of the gained benefits from using SC in HE. The ‘Expected Relationships’ was also discussed in similar context and raised similar concerns.
- The discussion about the ‘Signal-to-Noise Ratio’ factor revealed general consent between the involved instructors that the more noise from these tools might lead to less engagement in activities. On the other hand the students expressed acceptance of the frequent updates from the different parties in the educational organisation but feel happy with using ‘Social Hubs’ to filter any possible noise. Similar concerns were raised with the required ‘Codification Effort’ which might be required for replying many updates from different parties. They also feel convenient with the informal style of editing which is usually enough for typing and answering the SC updates.

6.6. Findings from the data analysis of the second data part

The following eight passages include discussion of the factors that have been proposed in this research and tested by the collected data from the survey results from one side and the validated factors by UTAUT from the other. The UTAUT model works as theoretical base linking the proposed factors with the validated results by UTAUT itself. Each proposed factor is linked to certain constructs in UTAUT with no relations to the others because of the nature of the linked factor and constructs. For example, the researcher suggested no link between ‘Reputation’ and the other UTAUT constructs, namely, ‘Effort Expectancy’, ‘Social Influence’, ‘Facilitating Conditions’ and ‘Use Behaviour’. Similar links are not suggested or tested between the other factors and the constructs of UTAUT because of no sense of that and also the interviewees agreed on those expectations.

The final result of UTAUT is the ‘Use Behaviour’ which means the usage of the technology. Gunther et al (2009) concluded that SC has the potential to leverage the teaching and learning experiences because of its potential to:

- Enhance the collaboration between the learners themselves and between the learners and their instructors.
- Help students to transfer their knowledge with their peers.
- Help learners to customize their learning times and styles.
- Facilitate modern teaching styles for instructors.
- Enhance the assessment system through the self and peer assessments.

So, when spotting the study of UTAUT on using SC in HE, the ‘Use Behaviour’ is expected to reflect on the teaching styles, collaboration, individual learning activities and assessments, which all can be considered as extended results of the proved results of UTAUT. These extended results lead to enhancements in the student learning. These reflections are represented in figures 6.14 to 6.21 by links between the use behaviour and the extended results.

i. **Reputation:** the initial hypotheses of this factor are:

H1: a strong link between using SC in HE and gaining a more positive reputation for the user in his or her community,

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H2: the better reputation affects the performance expectancy positively, and

H3: the better reputation increases the behavioural intention to use SC in HE

The survey results of the reputation-related questions show that there is a strong link between using SC in HE and getting better Reputation; this reputation increases the behavioural intention to use SC and consequently increase the performance expectancy positively (Average optimism levels of 89%, 85% and 82% across the samples as shown in Table 6-13). The above data are consistent across all samples, confirming the strong link of reputation with performance expectancy and with behavioural intention. In addition, numbers show that this factor has the strongest link among all hypothesized relationships. Hence, new link paths could be constructed as shown in Figure 6-13.

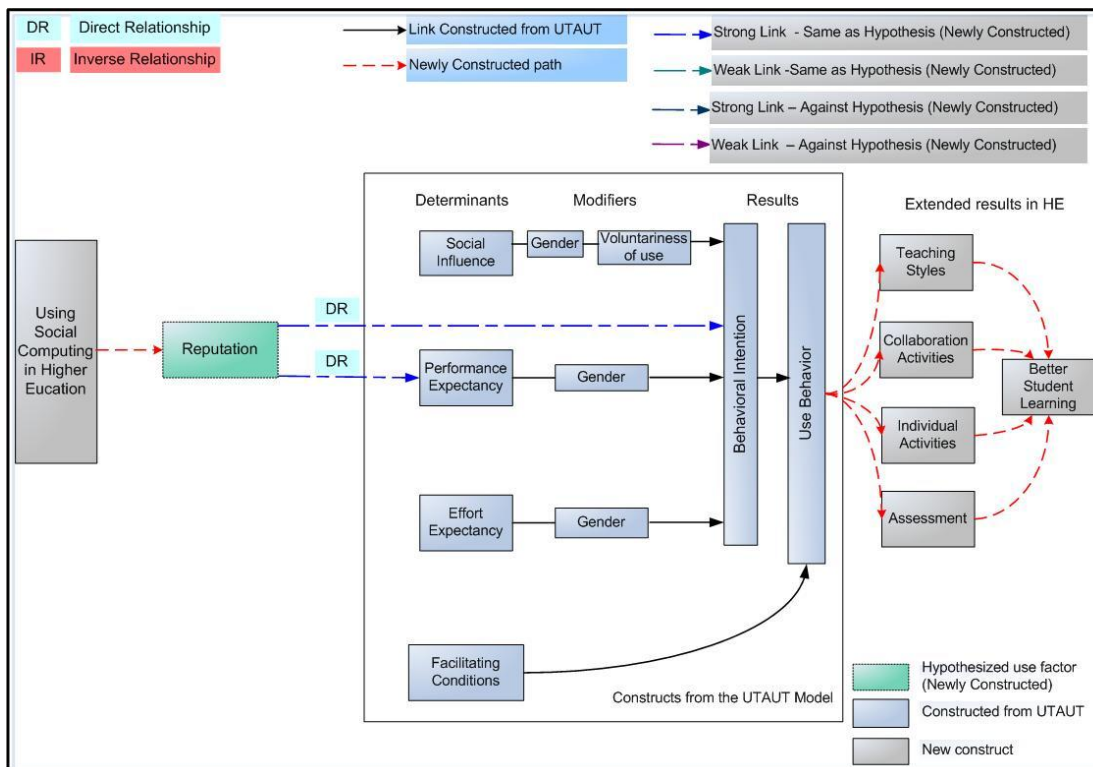


Figure 6-13: Reputation factor

ii. **Expected Relationships:** the initial hypotheses of this factor are:

H4: a strong link between using SC in HE and gaining beneficial relationships for the user in his or her community,

H5: the expected relationships affect the performance expectancy positively, and

H6: the expected relationships increase the behavioural intention to use SC in HE.

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The results from question 4.1 about the expected relationships are not as strong as reputation but still confirm strong relationships across all samples. An average mode of 4 with optimism level of 84% (as shown in Table 6-13) across all samples in question 4 shows the mind-set of all participants toward their behaviour to deliberately use SC to create relationships and receive benefits. Hence, a new link path can be constructed between using SC in academic institutions and the “Expected Relationships” construct. The responses of questions 4.2 and 4.3 confirmed also that building new relationships leads to developing more intention to use SC in HE (mode 5 and optimism 83%) and it will also push the performance expectancy to higher levels (mode 4 and optimism 82%). I.e. the “Expected Relationships” is positively related to the behavioural intention and performance expectancy. Figure 6-14 shows the new constructed paths.

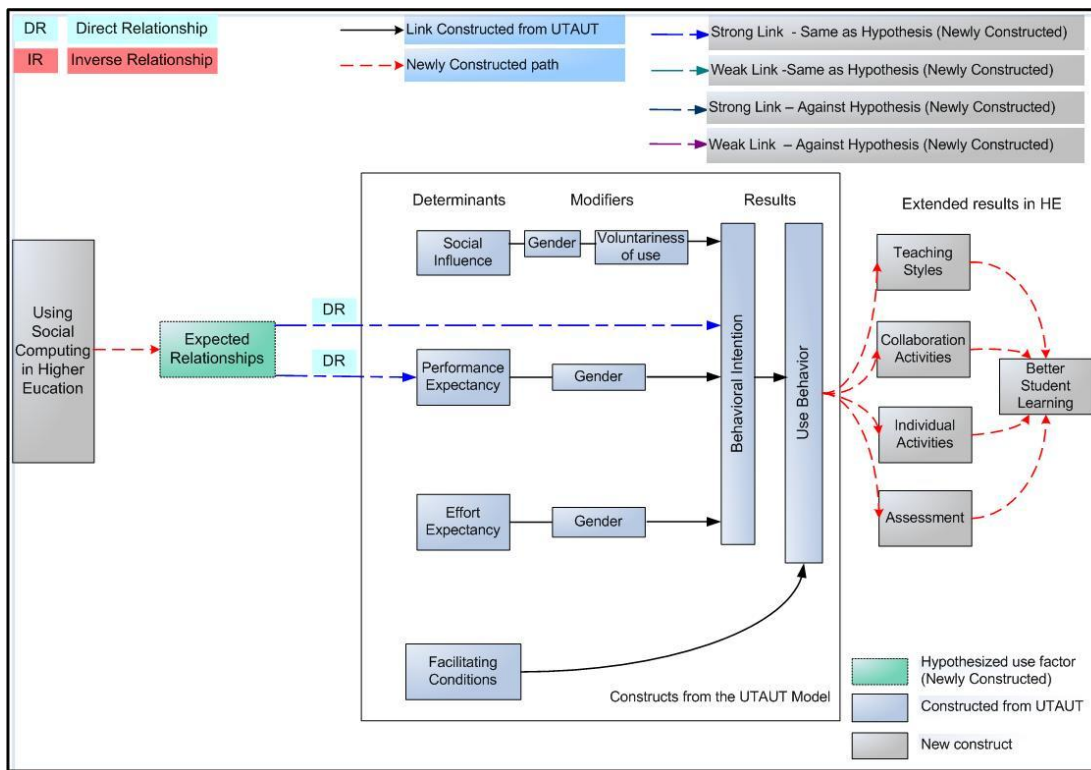


Figure 6-14: Expected Relationships factor

iii. **Communication Benefits:** the initial hypotheses of this factor are:

H7: a strong link between using SC in HE and gaining Communication Benefits of that,

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H8: the Communication Benefits is directly linked to the performance expectancy, and H9: the Communication Benefits is directly linked to the ‘Social Influence’.

The results from the first question 5.1 about the expected communication benefits confirm that the more use of SC in HE leads to better communication and more benefits of that communication (with mode 5 and optimism 86%). Answers of questions 5.2 confirm a strong relationship across all samples between ‘communication benefits’ and ‘performance expectancy’ (with mode 4 and optimism 82%), and answers of question 5.3 confirm a strong relationship between ‘communication benefits’ and ‘social influence’ (with mode 5 and optimism 81%). These results reflect user intention to use SC to communicate and acquire benefits from communication. New paths (direct relations) can be constructed between using SC in HE and the “Communication Benefits” factor, between “Communication Benefits” and “Performance Expectancy”, and between “Communication Benefits” and “Social Influence” in the UTAUT model. Figure 6-15 illustrates these paths.

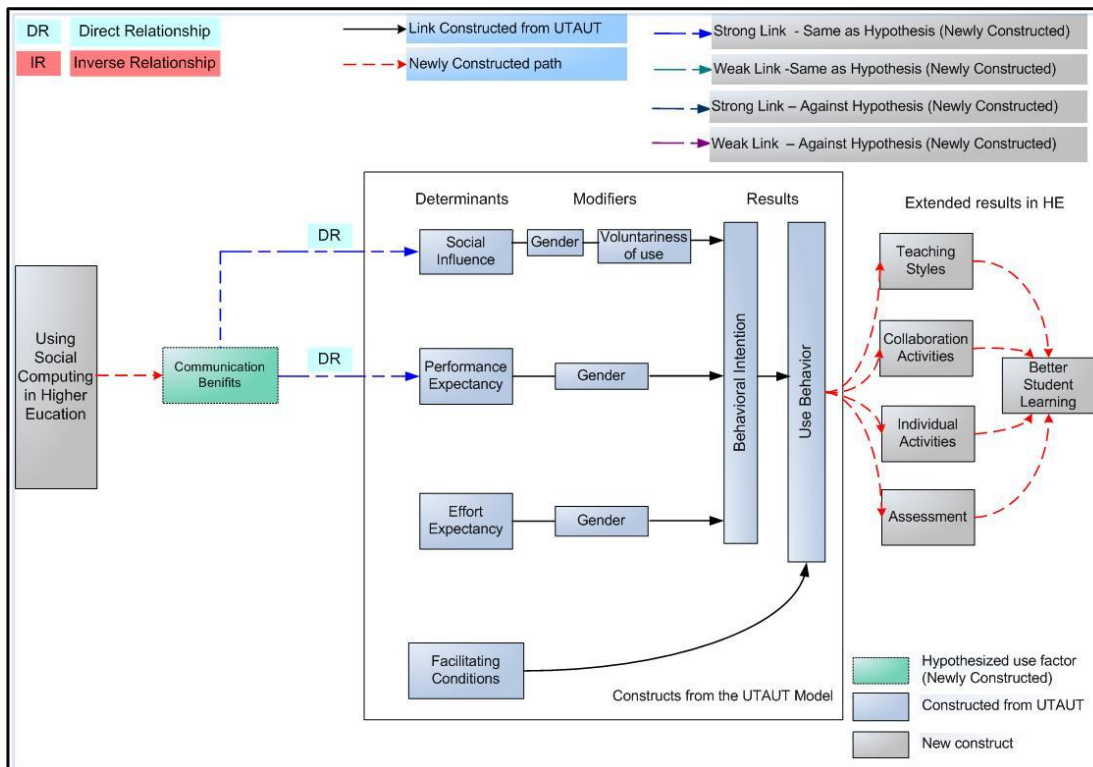


Figure 6-15: Communication benefits factor

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- iv. **Signal-to-Noise Ratio:** the questions about this factors started by the relation between using SC in HE and the expected amount of noise, then moved to confirming if the use of SC tools will DECREASE the quality of information exchanged among its participants, and ended by questioning if the use of SC tools is an efficient method to keep students informed about what they are learning. The important revelations from these questions had to reconsider the hypotheses about signal-to-noise ratio. The practical thought process from the reviewed experiences and literature made the researcher to develop the following hypotheses about this factor:

H10: a Direct link between using SC in HE and increased ratio of Signal-to-Noise (i.e. Signal > Noise),

H11: the Signal-to-Noise ratio is inversely related to the effort expectancy, and

H12: the Signal-to-Noise ratio is directly related to the performance expectancy.

Across all samples, the answers of question 6.1 revealed that participants believe that the signal-to-noise ratio will easily be greater than 1:1 when SC is used in HE (with mode 5 and average optimism of 92%). The average responses ranged from neutral to disagreement from the participants on using SC if the noise will be higher than the educational signal. This result confirms the need to develop SC networks and services dedicated for education. That will help users to benefit from using SC in HE with a lower ratio of noise.

When asked about the expected effort and performance when high levels of signal-to-noise being achieved, the collected answers of question 6.2 showed inverse relation between “Signal-to-Noise Ratio” and “Performance Expectancy” (with mode 5 and average optimism of 91%) which came against the initial hypothesis. Regarding the expected effort, the collected answers of question 6.3 showed direct relation between “Signal-to-Noise Ratio” and the “Effort Expectancy” which came also against the initial hypothesis (with mode 2 and average optimism of 29%). Hence, new link paths can be constructed between using SC and the signal-to-noise ratio, which is directly linked to performance expectancy and inversely linked to the effort expectancy. Figure 6-16 illustrates these paths.

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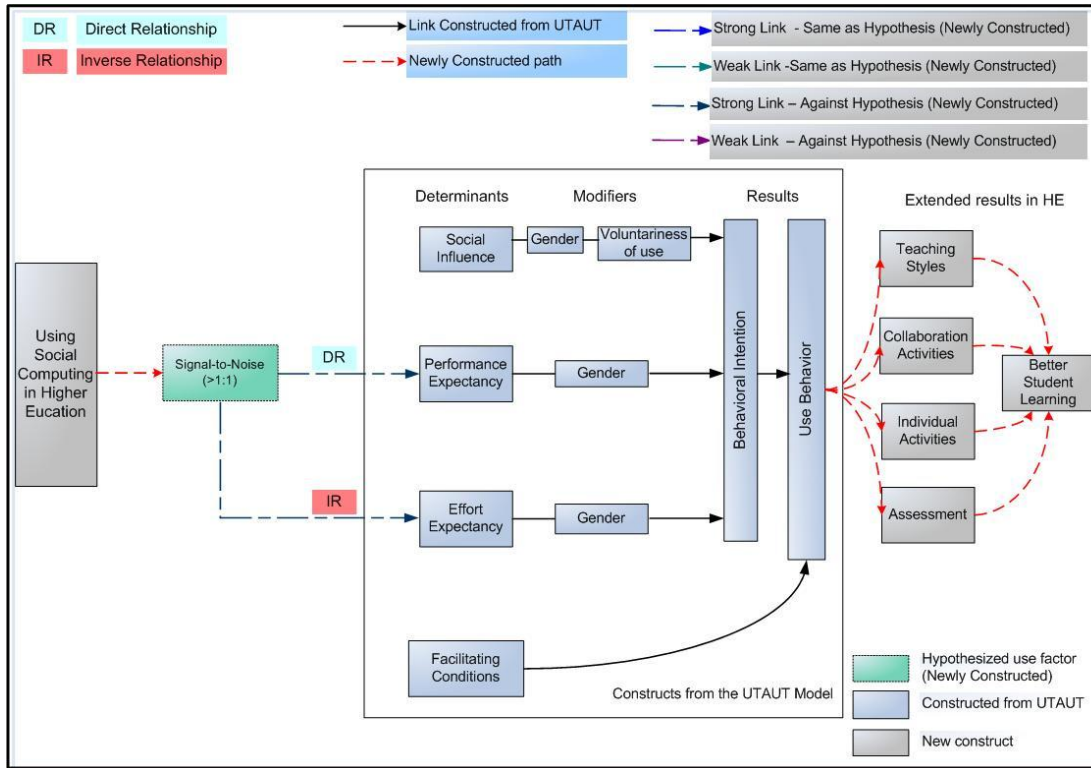


Figure 6-16: 'Signal-to-Noise Ratio' factor

v. **Codification Effort** : the initial hypotheses of this factor are:

H13: a strong inverse link between using SC in HE and spending more codification effort,

H14: the codification effort is inversely linked to the performance expectancy, and

H15: the codification effort is directly linked to the effort expectancy (logical hypothesis).

Responses to the codification effort questions show very strong agreement among participants on existing direct link between using SC in HE and codification effort from one side and an inverse link between codification effort and performance expectancy from the other side. Both questions for codification effort (question 7.1 on the relation between using SC and the required codification effort, and question 7.3 on the relation between codification effort and the performance expectancy) received modes of 5 with average optimism levels of 85% as shown in Table 6-13. So, a new link path can be constructed between using SC in HE and the codification effort, which is inversely related to performance expectancy. On the other hand, in addition to the collected

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answers of question 7.2 on the link between the codification effort and the effort expectancy, the logical sense confirms that a direct relation between “Codification Effort” and “Effort Expectancy” is possible. These paths are shown in Figure 6-17.

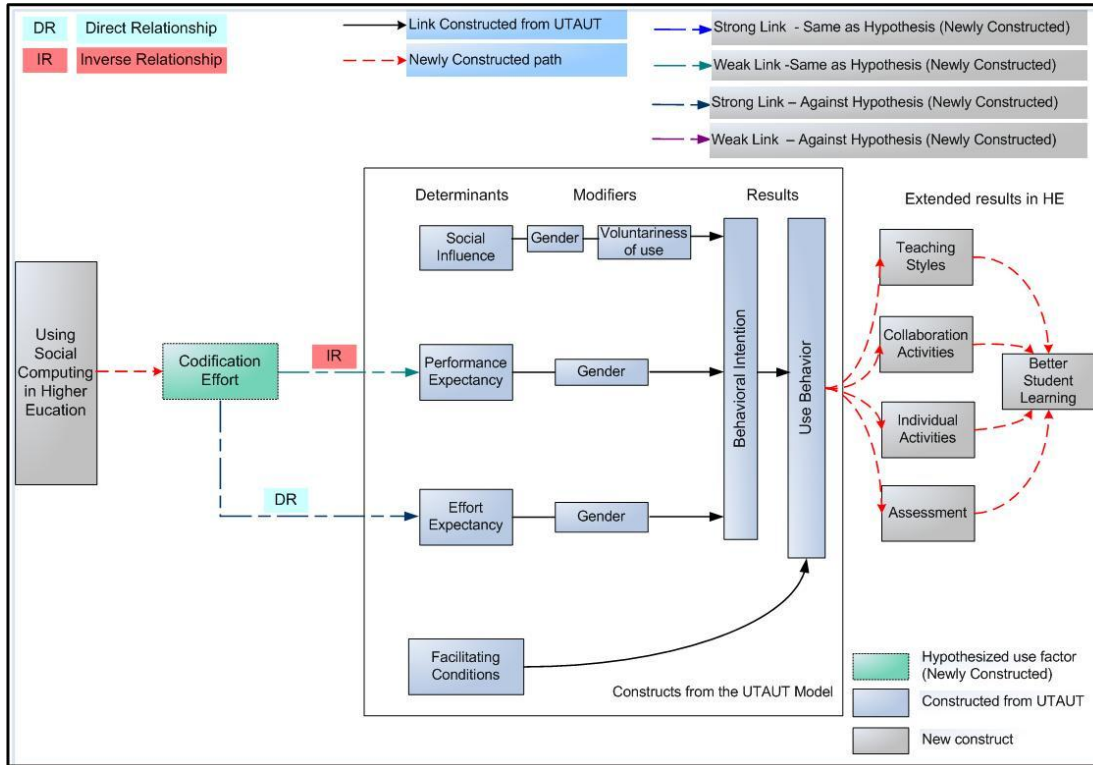


Figure 6-17: Codification effort factor

vi. **Privacy Concerns:** the initial hypotheses of this factor are:

H16: *using SC in HE is linked to the privacy concerns. i.e the users of SC in HE are concerned with privacy, and*

H17: *the privacy concerns are inversely linked to the behavioural intention. i.e the more privacy concerns leads to less behavioural intention to use SC in HE*

The second question about privacy (question 8.2) stated that there must be high levels of security in place for creating a positive mindset towards using SC tools in education. The answers consistently showed very strong agreement from most participants about that, but with low levels of optimism (average optimism level 72% as shown in Table 6-13) which confirm weak links with the behavioural intention. No other links are hypothesized with the other constructs of UTAUT based on the hypothesis that no behavioural

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intention leads to “no use” which means no need to study the performance, effort and facilitation related constructs. For the social influence, no clear link between privacy concerns and social influence can be hypothesized/studied.

In the context of privacy concerns, an average optimism level of 63% was recorded with mode 5 for question 8.1 about the existence of relation between the use of SC in HE and privacy concerns. Also 85% of the interviewed participants were neutral about the idea that the cost of security is more than the benefits one receives from deploying SC in HE. This could be due to a lack of actual implementation being done in Academia. So, link path can be developed between using SC and privacy concerns, which is inversely linked to behavioural intention as shown in Figure 6-18.

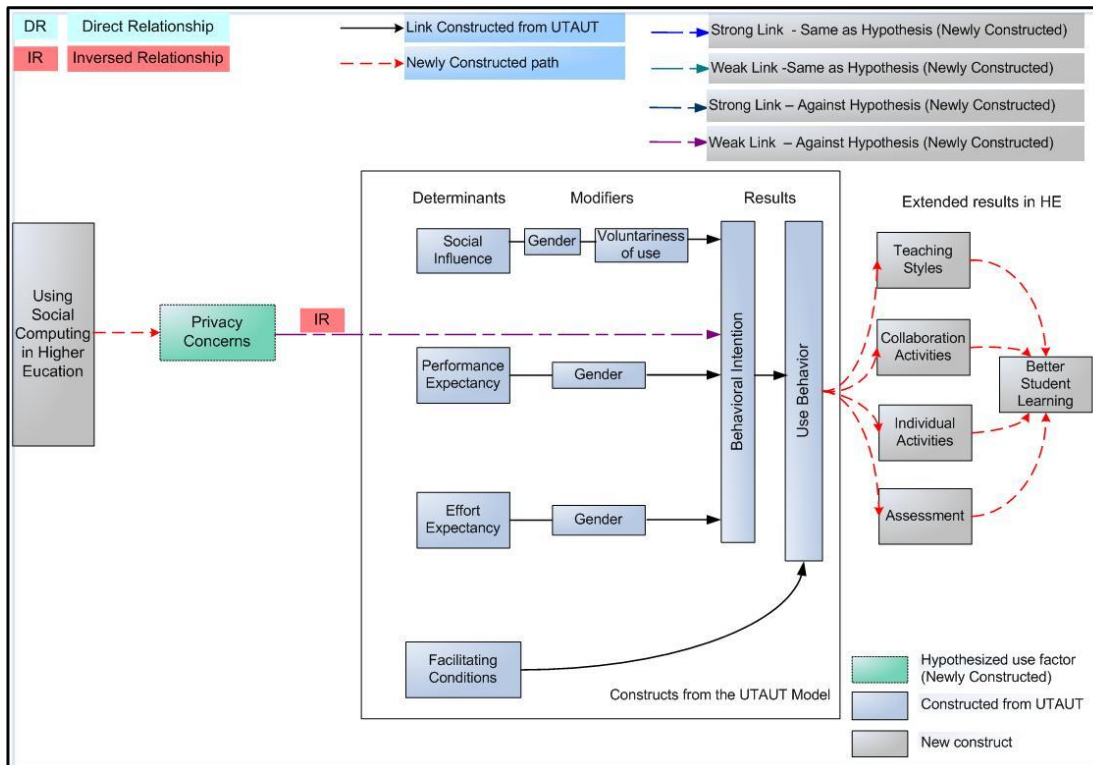


Figure 6-18: Privacy Concerns factor

vii. **Collaborative Norms:** the initial hypotheses of this factor are:

H18: using SC in HE is linked to the collaborative norms. i.e the users of SC in HE are concerned with what the others expect from them,

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H19: the collaborative norms are directly linked to the behavioural intention. i.e the more collaborative norms the user gains from using SC in HE the more behavioural intention to use it, and

H20: the collaborative norms are directly linked to the social influence.

Regarding collaborative norms, the answers of question 9.1, which is about the concern of the users about the collaborative which using SC in HE, reflected that it was important for the users to reflect good image for others when using SC in their educational activities (mode 5 and average optimism of 86%). This proves that there is a link between using SC in HE and the collaborative norms factor. The second question (Q 9.2) about studying if the time and effort required to continuously update the user information has to be shared with the other learning activities, received positive support from all samples (with mode 4 and average optimism of 84%). This is also approval for a strong link with the behavioural intention. The third question (Q 9.3), about if the collaborative norms increase the social influence of the user in his/her community, received strong agreement from all samples (with mode 4 and average optimism of 80%). These results confirm strong links between collaborative norms and behavioural intention from one side and between the collaborative norms and social influence from the other side. These relation links are illustrated in Figure 6-19.

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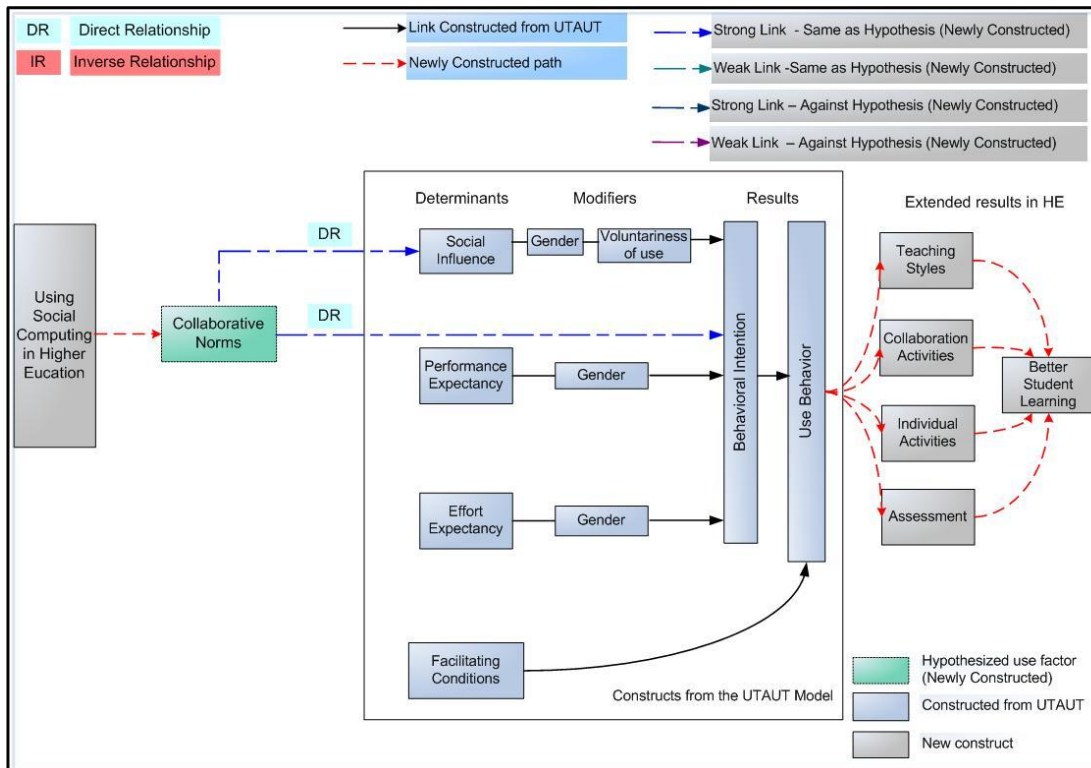


Figure 6-19: Collaborative Norms factor

viii. **Facilitating Conditions:** the initial hypotheses of this factor are:

H21: using SC in HE is linked to the facilitating conditions, and

H22: the facilitating conditions are directly linked to the behavioural intention.

The last two hypotheses are that strong facilitating conditions with regard to the infrastructure of the academic institution are required with a flexible budget for SC to flourish. The participants agreed that a flexible budget is necessary in implementing SC in HE. With an average mode of 4, questions 10.1 and 10.2 went strongly against this hypothesis (average optimism levels of 24%, and 27% as shown in Table 6-13). Based on the survey results, the participants summarized that SC applications would be used extensively regardless of the IT infrastructure of the organisation. The interview discussions included a clear tendency from all users to consider SC as a totally web-based technology; consequently, users would be able to use it regardless of the university's technology infrastructure. Although this is not absolutely true, since infrastructure capabilities, including the communication lines and security devices, might affect the level of use, this shows the readiness of the participants to use SC technologies with

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minimum capabilities. Although results were against the hypothesized link, they confirm the tendency of different stakeholders to use SC in HE. Hence, using SC can be directly linked to the “Facilitating Conditions” construct which is also directly related to the behavioural intention. Figure 6-20 illustrates this relation integrated with the UTAUT links between facilitating conditions and use behaviour.

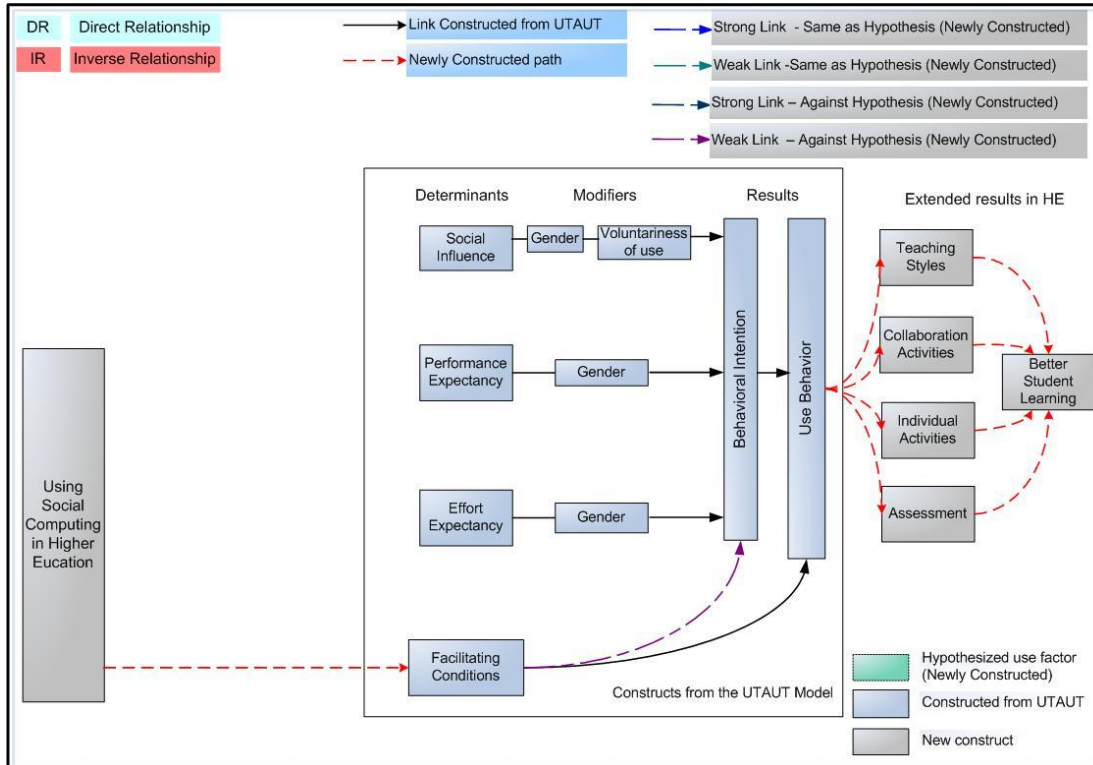


Figure 6-20: Facilitating Conditions factor

a. Framework Formulation (Putting it all together)

Table 6-14 summarizes the comparison between the results from analysis in this research and the hypothesized links based on the results from the deployed survey and interviews.

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Table 6-14: Factors analysis-part2

Q	Factors	Chosen Dependency	Hypothesized Link	Result from Analysis	Compare with hypotheses
3.1	Reputation	Using SC in HE	strong link	strong link	same as hypothesis
3.2		Performance expectancy	strong link	strong link	same as hypothesis
3.3		Behavioural intention	strong link	strong link	same as hypothesis
4.1	Expected Relationships	Using SC in HE	strong link	strong link	same as hypothesis
4.2		Performance expectancy	strong link	strong link	same as hypothesis
4.3		Behavioural intention	strong link	strong link	same as hypothesis
5.1	Communication Benefits	Using SC in HE	strong link	strong link	same as hypothesis
5.2		Performance expectancy	strong link	strong link	same as hypothesis
5.3		Social influence	strong link	strong link	same as hypothesis
6.1	Signal to Noise Ratio	Using SC in HE	strong link	strong link	same as hypothesis
6.2		Performance expectancy	<i>weak link</i>	<i>strong link</i>	<i>against hypothesis</i>
6.3		Effort expectancy	<i>strong link</i>	<i>weak link</i>	<i>against hypothesis</i>
7.1	Codification Effort	Using SC in HE	strong link	strong link	same as hypothesis
7.2		Performance expectancy	weak link	weak link	same as hypothesis
7.3		Effort expectancy	strong link	strong link	same as hypothesis
8.1	Privacy Concerns	Using SC in HE	strong link	strong link	same as hypothesis
8.2		Behavioural intention	weak link	weak link	same as hypothesis
9.1	Collaborative Norms	Using SC in HE	strong link	strong link	same as hypothesis
9.2		Behavioural intention	strong link	strong link	same as hypothesis
9.3		Social influence	strong link	strong link	same as hypothesis
10	Facilitating Conditions	Using SC in HE	strong link	strong link	same as hypothesis
10		Behavioural intention	<i>strong link</i>	<i>weak link</i>	<i>against hypothesis</i>

By integrating each of the studied factors with the UTAUT constructs, a new model can be formulated to predict the reasons that should be considered when

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implementing SC tools in HE. So, the following conceptual model can be presented to show the factors that affect the use of SC in HE as tested in the Gulf states' institutions. Figure 6-21 illustrates the framework constructs and how they are related to the original UTAUT constructs. It also shows how SC is linked to these constructs in a way that proves user acceptance of using its tools and consequently results in promoting learning levels.

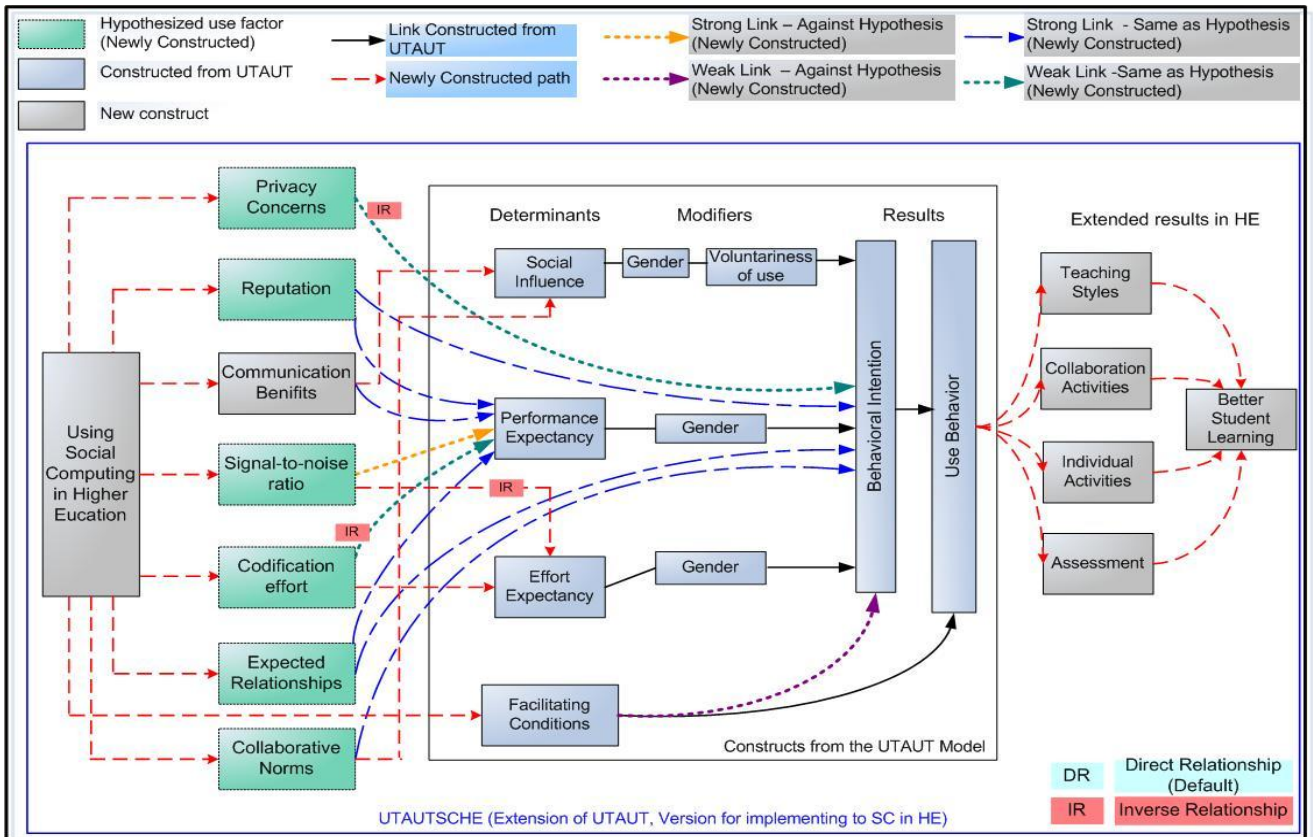


Figure 6-21: Conceptual Framework for implementing SC in HE in the Gulf States.

6.7. Summary of the chapter

In this chapter, the acceptance factors that might affect the implementation of SC in HE institutions in the Gulf States were studied. Set of hypotheses were generated based on the existing theories of technology acceptance, and then data collection was conducted to study the proposed hypotheses. The user acceptance of SC was studied through eight factors which might affect their behavioural intention to use SC and their

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use behaviour. These factors are: Reputation, Expected Relationships, Communication Benefits, Signal-to-Noise Ratio, Codification effort, Privacy Concerns, Collaborative Norms and the Facilitating Conditions. The used research methods included Surveys and interviews. Based on the findings of these methods, using SC in HE in the Gulf States is linked to all these factors. This means that it affects its relation with the behavioural intention and consequently the use behaviour . Inverse relationships between the Privacy Concerns, Signal-to-Noise Ratio and Codification effort from one side and the behavioural Intention from the other side were concluded either through direct or indirect relationships. The rest of factors had positive relationships with the behavioural Intention either in direct or inversed links. To sum up, new theoretical framework has been developed to collect all these relations together and prove the existence of great opportunity to leverage the teaching and learning processes in the HE in the Gulf States through enhancing the level of student learning and engagement by implementing SC in HE.

Chapter 7

The Online Course System
(OCS) Prototype

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7.1 Introduction

In this chapter, a prototype of the new online course system will be explained as a measure towards pragmatic validation of the conceptual framework produced in Chapter 6. The system prototype instantiates the conceptual framework via embracing a subset of functionalities that are derived from the different constructs of the conceptual framework. As an example, a social hub, which works as a filter for any unwanted threads, through defining rules for that, has been included in the system to enhance the signal-to-noise ratio. Similarly, different writing platforms like blogs, wikis, and discussion boards, which use different writing styles from casual to formal writing, have been included to minimize the required codification effort. So, the system prototype is built on utilizing the popular SC tools in order to enrich the virtual learning environment with more collaboration and socialization activities that help students to learn in an easy way, with facilitation of the learning resources. The prototype investigation delves into the literature of system prototyping and its validation. The prototyping process utilizes the data that were collected from the students and teaching staff with an evolutionary approach in which a group of surveyed instructors and students were involved.

The prototype employs SC tools to support the teaching staff in leveraging their course delivery methods to promote student learning. This support comes through a customizable learning environment that could be tailored to the student's interests. It also comes from enabling useful collaboration and socialization tools. These tools help the students to increase their awareness about the academic environment at all and about the courses they are registered in. Some of these tools help communication with the course instructors and peer colleagues. Some others will reflect the new updates in course news, content materials, and student grades. A third group will facilitate collaboration with peers in discussing and sharing knowledge about course topics.

The prototyping process goes through procedural prototyping steps. After defining its objectives, the process starts by analysing the user categories and user requirements and then developing a conceptual design that includes all the required functionalities in the new online course management system. The conceptual design goes under paper prototyping to generate an interface of the system. The prototype is tested through an evaluation by a group of users (including students and instructors). According

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to the user evaluation, the prototype is reviewed and updated accordingly, which reflects on the original conceptual design and the prototype design. Then it will be retested for usability and user satisfaction. This evolutionary process continues until a satisfactory version, which undergoes a process of final testing and validation, has been developed. After that, the final design is proposed for technical evaluation to define the technical requirements, which is required for implementing it in the final system product.

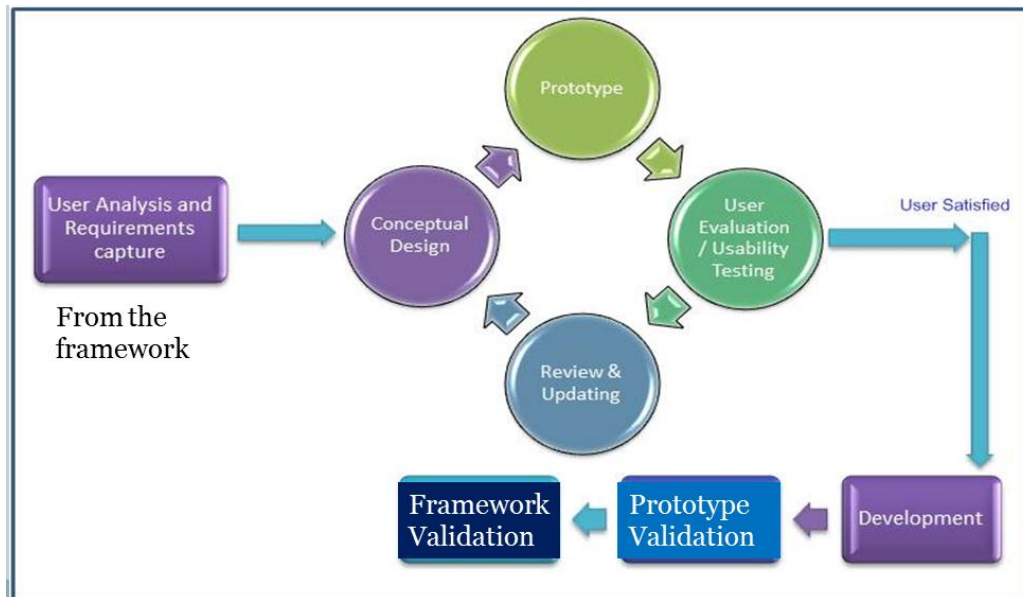


Figure 7-1: The prototyping process.

7.2 From Framework to Prototype

In validating the research on Information systems, Hevner et al (2004) argued that prototyping represents the practical validation of ensuring valid research findings. This research uses the prototyping technique as practical validation of the developed conceptual framework. So, to develop the new system prototype as an instantiation of the framework factors, the following list explains how this research utilizes the different SC tools that foster collaboration and facilitate content sharing in a way of developing user reputation, developing relationships between the different parties, ensuring user privacy, reducing the required effort for codification, increasing the Signal-to-Noise ratio, developing collaborative norms, enhancing the expected relationships and facilitating the required conditions for implementing SC in HE in the Gulf States.

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- ***Developing Reputation and Collaborative Norms:*** Donath (2001) defined the reputation of a person or group of people as an opinion or by another meaning a social evaluation of that person or group based on a set of criteria. It is considered as an entity for identification of that person or group. On the other hand, ‘Collaborative Norms’ is about the extent to which an individual believes that others feel that it is important for the individual to use the system. Gunther et al (2009) claim that ‘Collaborative Norms’ is shown as more informal than the social influence. This perspective helps in developing more informal communication between people involved in the social system. Such informal communication can result in the desire to learn and the desire to conduct research and development. So, it makes sense in this research to include the collaboration and communication tools that facilitate the interaction between the course communities, which consequently reflects on the reputation of each of its members and the developed collaborative norms between them. These tools include chat boxes, microblogging tools (like Twitter), Instant Messaging (IM) boxes, Blogs and Discussion Boards which all are part of the SC domain. Future developments of the proposed system (OCS) might include also any other emerging SC tool(s) that foster collaboration and affect the development of user reputation and collaborative norms. So, based on the framework factors of Reputation and Collaborative Norms, those SC tools will be added to the OCS prototype.
- ***Signal-to-Noise Ratio:*** this factor was introduced in chapter 5 with definition of Signal-to-Noise ratio as the amount of useful signals that can be transmitted through a medium as compared to the noise in the environment. Individuals in organisations are coping with a lot of noise in terms of email, phone, IM, etc. In this research, using SC tools like Social Hubs and building blocks for integrating the different SC tools within the proposed system (OCS) can provide the practical guarantee in decreasing the amount of noise compared to the beneficial posts (represents Signal). So that, OCS interface will include Social Hub and ‘Course Community’ list to ensure higher ratio of Signal-to-Noise.
- ***Codification effort:*** On commenting the communication through the SC platforms and how it can reduce the required effort for codification, Gunther et al (2009)

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correctly state that “this means less interruptions of the employee’s work flow and more time for task performance”. To enrich OCS with such tools that help in minimizing the user codification effort, the SC tools that need less codification effort will be involved. These tools include blogs, Microblogging tools, IM and discussion boards.

- ***Privacy Concerns:*** in the context of ensuring privacy and supporting users with protection of their information, the suggested system (OCS) is mainly based on developing it in dedicated, secured and separate environment far from the public SC networks and tools, but with back-end integration of these tools within the system itself. This development ensures higher security and consequently user privacy.
- ***Communication Benefits and Expected Relationships:*** Social Networking tools like Facebook and LinkedIn, IM, microblogging, Peer-to-Peer assessment tools, online content editing tools like Google Docs and bulletin boards are included in OCS to facilitate communication and collaboration. As per the task analysis of the prototype (introduced in section 7.7 of this research), these tools will help in achieving benefits and useful interaction.
- ***Facilitating conditions:*** this includes sharing the online course content in easy to access way. That content includes course-related photos, video, discussions, blogs, assessments... etc. SC tools like Flickr, YouTube, Discussion Boards, Blogs and Wikis are included in OCS to easily handle the content sharing and collaboration. So, the design of OCS will include those SC tools to ensure facilitating conditions within the course environment.

7.3 Prototyping the SC Platform

In the following pages, the prototype design will be introduced. The prototype is based on the idea of using SC tools for facilitating learning through collaboration, awareness, frequent updates, content sharing, a customizable learning environment, and more engagement of all course students. The core objective of the new system is to keep the students engaged with their learning community of colleagues and instructors. This

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engagement is based on user acceptance of SC as an emerging technology. Although there are already existent Virtual Learning Environments (VLEs) and systems that supports e-Learning with tools from the available SC platforms, there are clear miss of integrating these tools and the other SC tools in these systems.

7.3.1 SC in the existing VLEs

The following section includes review of the existing VLE systems in a way of highlighting the issues of miss using SC effectively, with explanation of how the proposed system (OCS) in this research address these issues.

Table 7.1: Review of the existing VLEs

Product	Use of SC tools
<u>Blackboard</u>	The new version (Bb Learn version 9.x) included the mashup technology for importing SC content from YouTube video, Flickr, Slideshare presentation, NBC content and Scholar bookmarks. No clear functionalities for using the other SC tools
DesireToLearn	Use of shared quizzes and question library, ready to link to SC tools with no built-in functionalities for using the SC tools.
Web CT	Old versions have no built-in functionalities for using the SC tools. The new version has been merged with Blackboard Learn.
<u>SharePoint</u>	Ready for developing SC web parts. No clear functionalities for using the other SC tools
<u>StudyWiz</u>	Very good tool set for collaboration, specifically tools for Forums and Wikis
<u>Moodle</u>	Excellent supportive online community communication. No clear functionalities for using the other SC tools
<u>Frog</u>	Weak Forum Tools. No use of the other SC tools
<u>SLG</u>	No functionalities to help using of SC at all.

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Most of the existent e-Learning systems have the capability to link with the SC tools and websites. But there are no integration between these systems and the SC platforms in a way of securing the user posts, ensuring the user privacy, avoiding the high noise, assessing the user collaboration and aggregating these evaluations and assessments with the course grade centre. The proposed OCS system in this research is designed to include the following integration and security features:

- 1- Back-end integration with the different SC platforms based on the availability of the integration building block that are provided by the SC platform vendors.
- 2- This integration ensures security of the SC tool data. The security is also provisioned by implementing proper security frameworks for HE technology systems. This enhances the security of the system at all.
- 3- Registering the user posts into the OCS database to ensure security from one side and to use these inputs in other tables for reporting, like grade centre reporting tables.
- 4- Integrating the assessment of the user posts on the SC websites into the course grade centre. This enhances the assessment technique within the course and evaluates the self-learning of the student.

With these features, OCS could be used with guarantee of information security, user privacy, higher signal-to-noise ratio, less codification effort and with proper facilitating conditions that help students to collaborate and share course content easily and beneficially. In this way, many SC platforms can be embedded into the OCS system; even the emerging SC technologies can be tested for that integration and benefits to users, then add in future developments of the system.

7.4 Rationale for collaborative SC platforms

Some cultural norms make it harder or even do not allow for male and female students to collaborate and interact together in class. Most of the Arab Gulf universities have separate campuses for male and female students. The course instructors spend more efforts and time to facilitate teaching on both sites for male and female students.

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Although a few of those institutions are using the new learning technologies, such as video conferencing, there are still no real benefits of using these tools at its potential.

Another concern arises from the segregation of male and female students over geographically remote campuses: the low level of awareness of university news and events between the students' communities. For example, the university might announce a life skills training or language courses in some building or campus, and many students are not aware because they do not visit that location and there is no wider communication of the offering.

A third concern can be highlighted when assessing university outcomes in the labour market. Many graduates get into trouble in the work environments because of their low-level or misconception of the real benefits of collaboration. There is no real adaptation to the new trends of social media and web 2.0 technologies. These technologies have become available and are usable in many business organisations.

7.5 Impacts of the prototype on the use of SC in HE

The idea behind this system prototyping is to develop a collaborative environment for students and instructors to communicate, collaborate, exchange knowledge, and raise their awareness of course content updates, future events, and any other course- or university-related news. The new course design includes areas for many of the new emerging SC tools. These tools will be presented in such a way as to make it easier for students and instructors to find or distribute information and updates about their studies. Implementing such a course system will help the students and instructors to

1. Easily find information about their courses online on their social media networks profiles, microblogging tweets, RSS channels, or on their mobile and movable devices
2. Keep informed with any course updates either in content or any other news, including new assessments and grades
3. Find course resources like vodcasts and podcasts on the internet easily
4. Customize their learning styles, or schedules as per their convenience, so, they stay engaged all the time and follow up their lessons easily

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5. Contribute in developing the course content through editable course wikis and journals to feed their experience about the course to their colleagues and even future prospective students
6. Develop new rapport and meet new people from the learning community
7. Share content and exchange files with colleagues
8. Access information and informal learning
9. Engage in communities and express themselves with the others
10. Foster group collaboration and help in achieving project work
11. Help instructors to support students with additional learning materials and resources

7.6 User Analysis

In human computer interaction (HCI) designs, the user analysis represents a crucial aspect because it helps to formulate reliable findings based on user characteristics and the task they will perform (Dillon, 1996). Karat (1991) and Norman (1986) place great emphasis on understanding the user profile, user categories, and user needs. To that end, the design teams analyse the task and user characteristics including the user categories and the user needs at early stages of the product development process. They consider that understanding the user needs, abilities, and categories is important before deciding on any design options. This section includes the user analysis of the system under prototyping. The next section introduces the task analysis to ensure understanding of the system users and the tasks they will perform.

7.6.1 User Description and Profile

The expected users of the new online course are university students, instructors, and other university stakeholders who could access the online learning resources and news. The main focus is on the students and instructors who are expected to have a big share in using the e-Learning course activities. Both the students and instructors can be described with the following characteristics:

1. They have, at least, basic computer skills to use internet and web-based applications.

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2. Considering the instructors' work nature and the age of the university students, they are expected to have high interest in online communication and collaboration and are, especially, students who tend to form communities and work together.
3. They are expected to share information and contribute in discussions, group assignments and projects, and work in groups.
4. They tend to socialize with colleagues and to have representative profiles of their personalities.
5. They are interested in the new trends of technologies including social networking technologies.
6. Most of the students are Generation Y students (demographic born between 1982 to early 2000s). McCrindle (2005) defined the following characteristics of Generation Y students:
 - a. Technologically savvy
 - b. Have an increased use and familiarity with communication technologies, social media, and digital technologies
 - c. Walk around the university campuses between classes, talking on their phones or listening to iPods or even doing that during classes
 - d. No real memory of life without computers and cell phones
 - e. Have always gotten bored easily
 - f. Are a generation of remote controls, hyperlinks, Facebook, and endless hi-tech college-student distractions

7.6.2 User Categories

The users of the online courses are classified per their institution roles. A variety of roles exist in all HE institutions, including students, instructors, observers, management staff and guests. In order to manage their access to the proposed course system, they will be classified into the following groups and assigned access privileges as per each group:

1. Undergraduate university student. These are students who are taking their courses onsite or online through distance learning programs

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2. Postgraduate university student. Some are full-time and some are part-time students. The full-time students usually attend lectures on campus; however, the part-time students join online sessions or study remotely using the virtual learning environments or distance learning sessions.
3. Instructors or faculty members. They usually use the online courses to distribute class content materials including videos and podcasts, assign homework to students, conduct online assessments, announce events and exams, grade students, communicate with students, offer office hours to support their students, develop an awareness of course updates through instant communication with students, and collaborate with students about the different course topics.
4. The other stakeholders of the university, like management staff and student observers who usually need access to generate or read performance reports, follow course issues, and may be checking for applied university standards.

Each category of the system users will have a certain limit to access the system content. The university students and instructors will have access to the system application and database; however, observers will have limited access to these resources. Figure 7-2 below illustrates the layered approach of user access for the different user groups.

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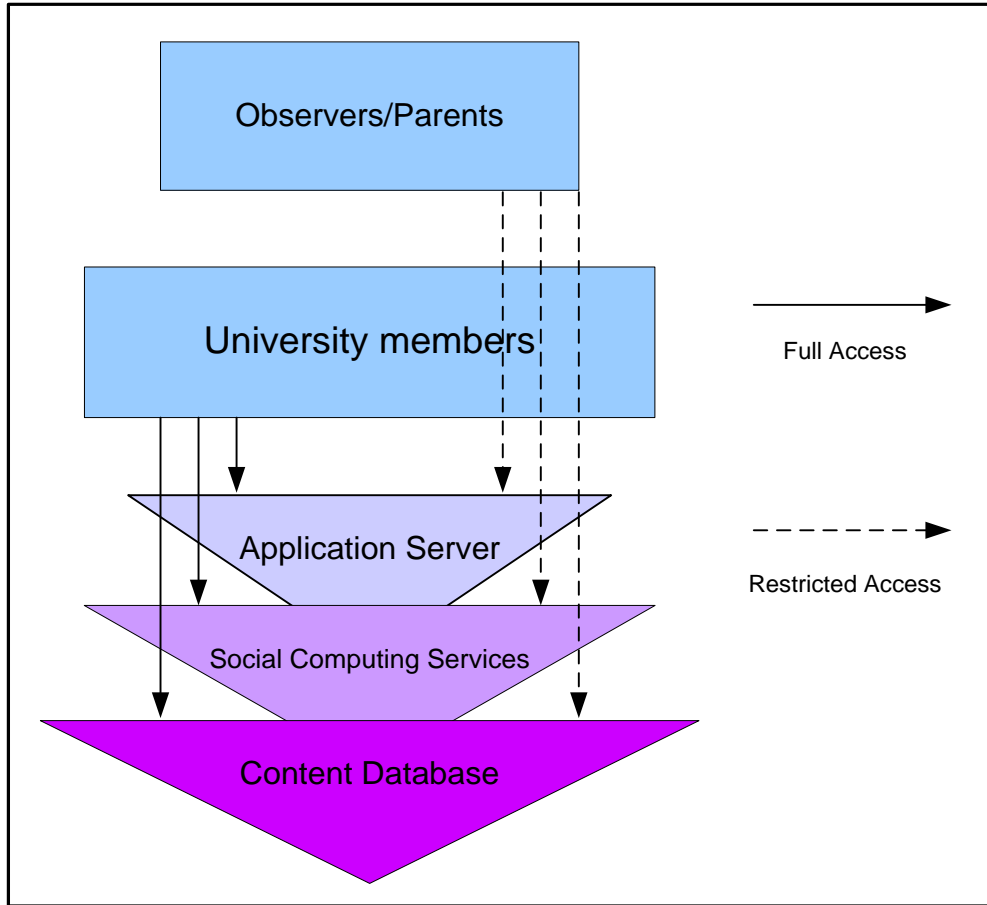


Fig. 7.2 Layered approach and user access types

7.6.3 User needs

The main needs of the students and instructors involve following up their course work and institution needs. These needs include:

- Downloading/uploading class materials
- Engaging in the online discussions and collaboration sessions
- Adding/checking new notifications and course announcements
- Following up calendar events
- Taking/developing a variety of assessments including tests, surveys, and assignments
- Checking subject grades and performance reports

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- Working with colleagues online on projects and other course work that use online software such as online presentations and docs
- Watching vodcasts, listening to podcasts, or downloading similar files
- Editing journal entries, editing wikis, or typing in a blog or microblog
- Doing activities that are required by their instructor, for example, locating certain content on YouTube, Second Life, and similar useful sites
- Defining bookmarks and tagging useful websites as learning resources, which helps them to customize their learning by extending it beyond the predefined course content to include interesting resources from their choice

As described before, the current university students are Y-Generation students who tend to socialize and have fun through collaboration within their communities. So, online communities emerge as a need for them to collaborate and do group work. Figure 7-3 illustrates the expected user needs from the online course system.

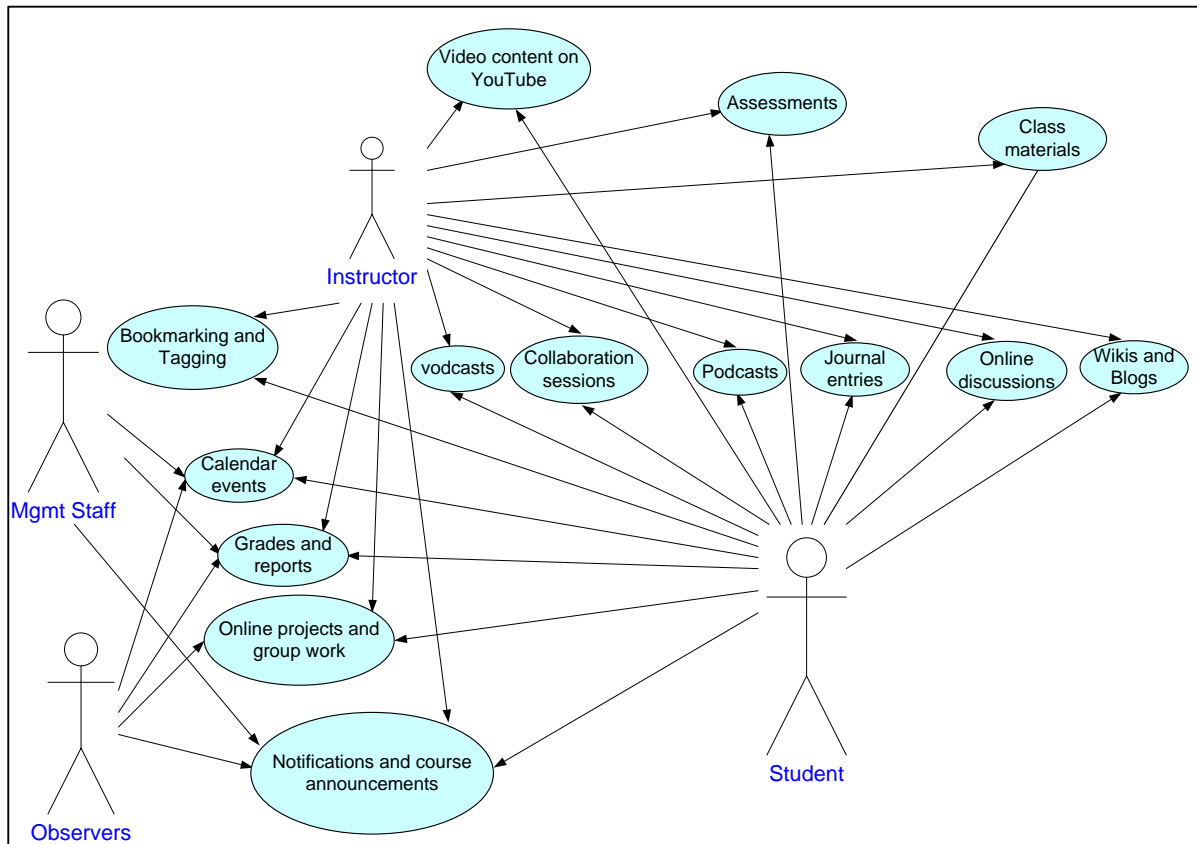


Figure 7-3: UCD (use case diagram) of the user needs.

7.7 Task Analysis

Preece, Rogers, and Sharp (2002) claim that when practitioners and researchers build user-centred systems, they take into account the natural human limitations to make the system itself intuitive and pleasurable to use. Central to the design of such systems is to understand what the users want to do, what they will actually do, what their tasks are, and analysing the nature of these tasks. The “task analysis” refers to the way people do their jobs. It includes determining what they will do with the system/product under development, what things/elements they will use and what they must know to do that.

In this research, the suggested prototype design is based on facilitating the following tasks for the course members:

1. Upload/download course content files
2. Develop discussion forums and make it easier for instructors to grade the student posts on it
3. Create blogs and wikis and grant the students the privilege to edit and develop their content
4. Make the instructors able to import content from the SC websites including YouTube, flicker, and the other mashups websites
5. Assign students access to online office applications such as Google docs within the course content areas
6. Add RSS feeding channels to the course and assign students separate areas in which to comment or ask about its feeds
7. Link the course content with the virtual web environments like Second Life to make it easy for instructors to virtualize some course activities when needed and support student learning and imagination through virtual reality worlds
8. Add media sharing websites and content like podcasts and vodcasts to the course to enrich the course content with a variety of methods that might contain at least one method that matches each student learning style (Media sharing websites contain many audio and video files and they include YouTube and Flickr as well.)
9. Tag some website and add it to their favourite lists

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10. Socialize with their colleagues teaching the same course to discuss more about the course related issues like course times, course topics, assessments, course events, and course content
11. Add content files, add notifications, edit content modules, upload assignments, add/take assessments, check for grades, deploy course surveys, and communicate with the other people in the course.

As per the introduced user analysis (in the previous section), the users of the online course system are all stakeholders of HE, who are expected to have the required basic computer knowledge to use the system and do the tasks required of them. The system usability and ease of use are expected to develop an interface that will facilitate completing the defined tasks for system users.

The activity diagrams below (Figure 7-4a and 7.4b) illustrate the defined tasks of the online course system under prototyping, in general, and as per user role.

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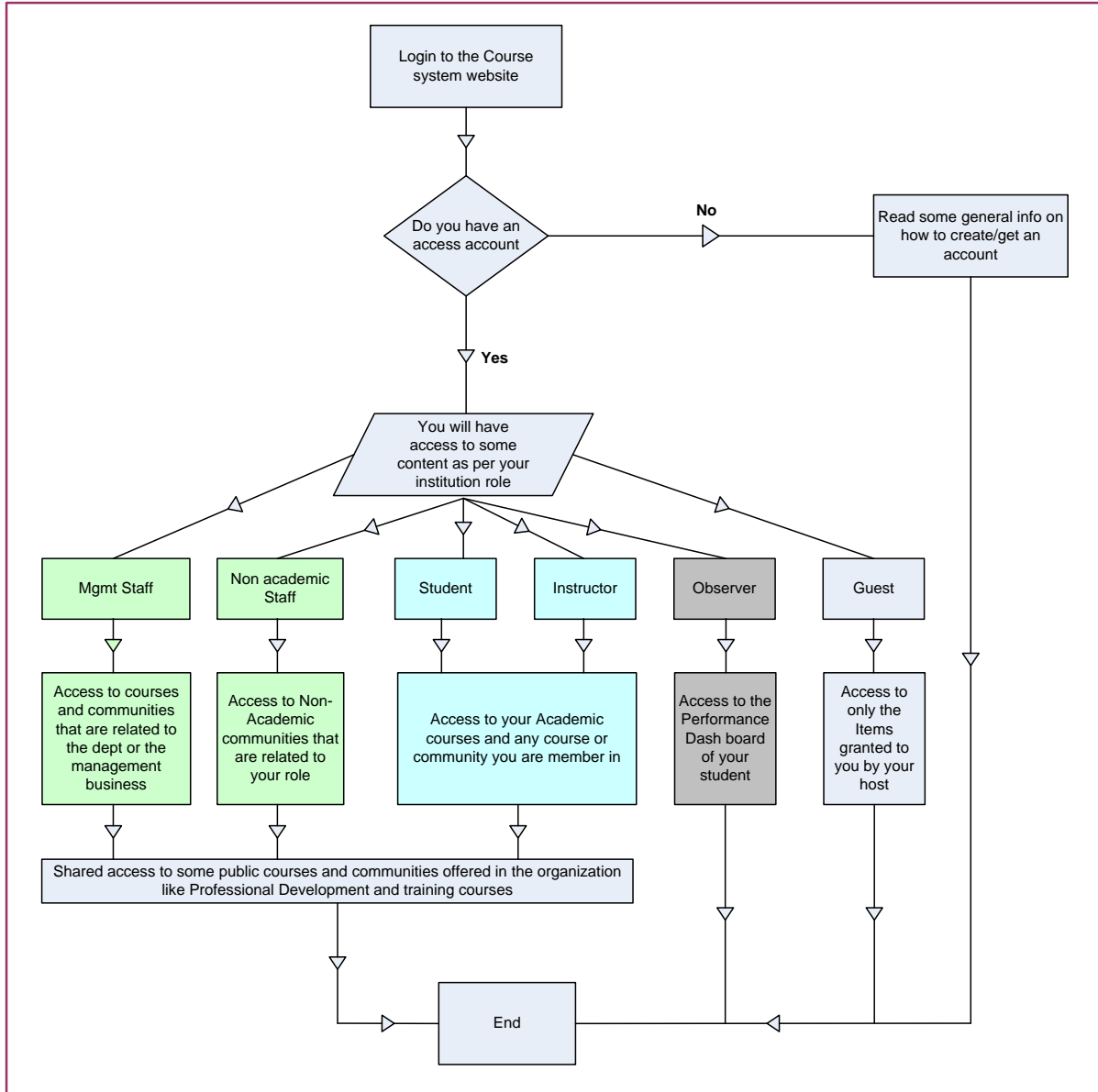


Figure 7-4a: Activity diagram for the defined tasks of the online course system per user role.

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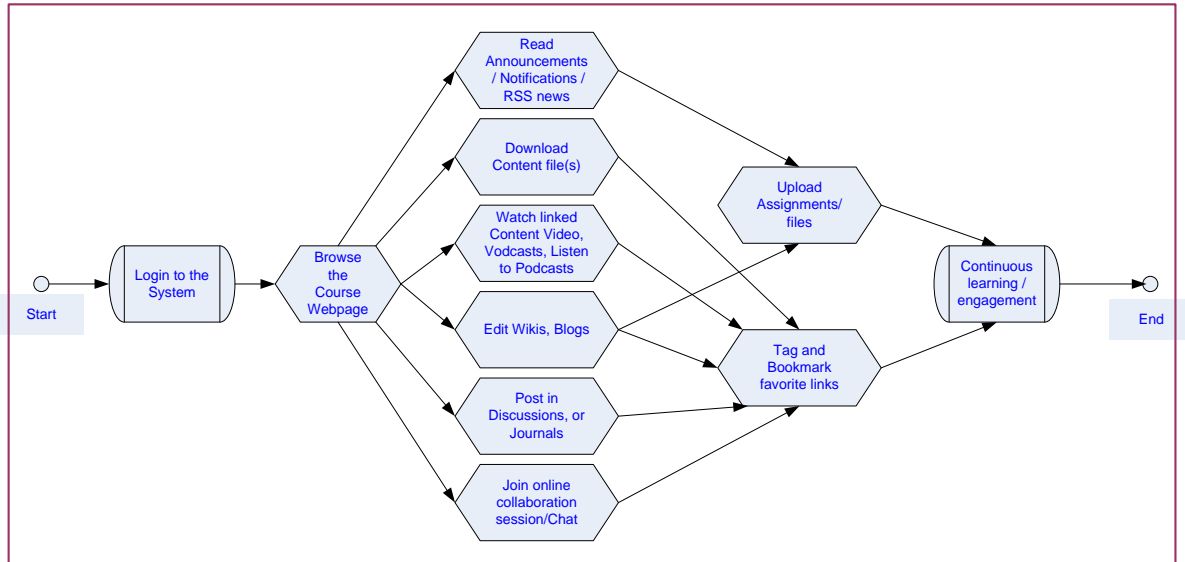


Figure 7-4b: Activity diagram for the defined tasks of the online course system.

7.8 Functional Analysis

The new course-system interface is designed as the front-end of the Relational Database Management System, which records every hit by users. This system will be technically designed to integrate with the external social website systems like Facebook and YouTube. Such integration will help instructors to secure their course content and grade any collaboration on the content that was imported from these social websites into the course. This integration is expected to be implemented and organized with these websites' owners to guarantee proper performance and avoid any copyright violations. It also might be useful to prepare the course website code to integrate with the most known virtual learning environments (VLEs) and students information systems (SISs) to make it faster for the organisation that has such systems to implement the course system on their servers, migrate the available data to the new system, or integrate it with the other systems.

All course materials such as files and folders will be hosted on a separate storage server. The storage server will be connected to the database server in such a way as to make it faster to access course content as per the user request. Storage area networks (SANs) are the suggested solution for that. Firewalls and security systems could be configured to protect the course system and ensure security for student information and

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uploads. It could be a simple or a complex configuration for security and website setup according to the organisation's needs. For example, some universities might publish course websites on their virtual local area network (VLAN) only, which might need fewer security implementations than another university that publishes on the internet.

All the student posts and grades would be saved in separate tables in the database to segregate them from the course content data. This would make it easier for the instructor to recycle the course when the academic year ends and reuse its content with another group of students later. For example, discussion board entries could be saved in a database table called Discussion Entries and grades saved in another table called Student Grades. In this way, performance reports could be generated easily and the student monitoring screens could be designed more easily.

The back-end database system will be configured to integrate with the existing student information system (SIS) in the university to make it easier to handle student enrolments and faculty assignments. This integration might be extended to include the student grades extraction to the SIS to make it easy for the university administration to unify the student information data sources and find all about the students in their SIS. In case of such integration, it could extend to include a user directory system to unify the student account authentication source, that is, develop a single sign-on module for the university that guarantees a secure environment, and make easier for students and instructors to log on to the course website because they will not have to recall many different account credentials. The Unified Modeling Language (UML) diagram below (Figure 7-5) illustrates the functional design of the proposed course system.

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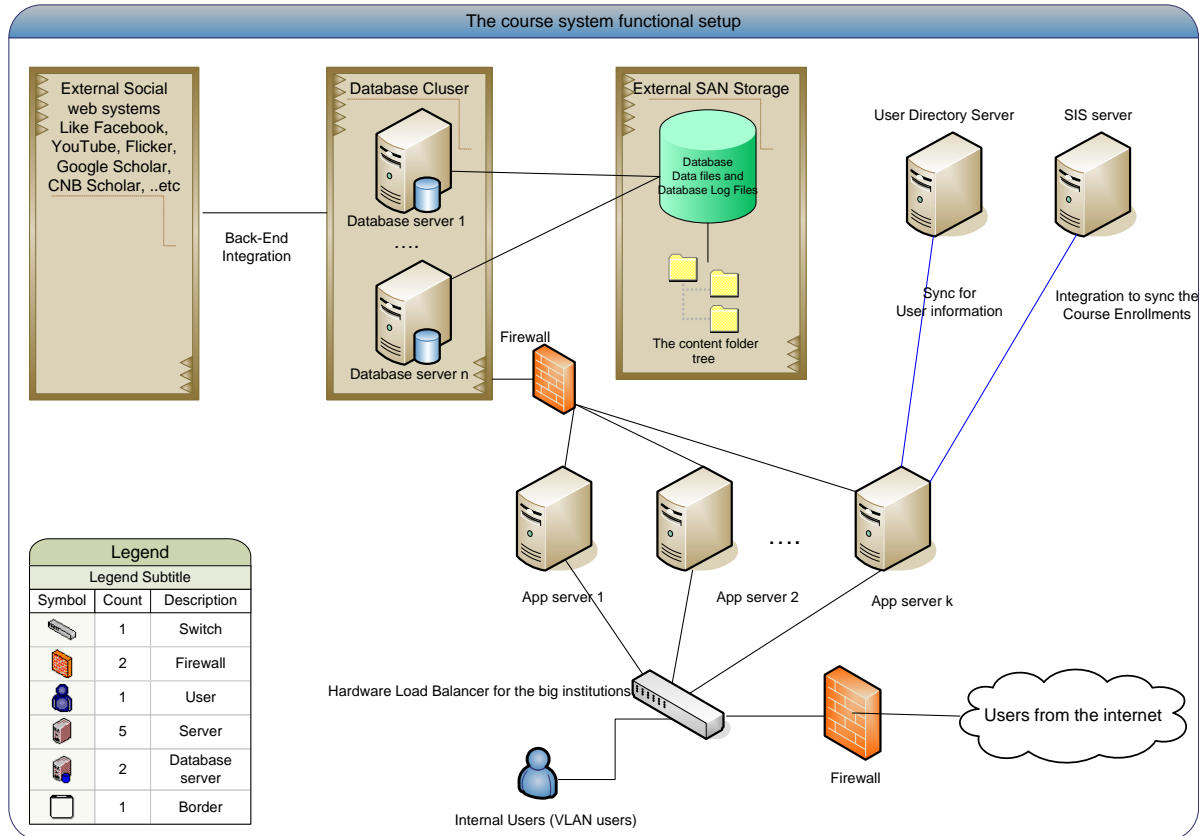


Figure 7-5: UML diagram of the functional analysis.

7.9 Conceptual Design

Beyer and Holtzblatt (1998) stated that the Conceptual Design in Human Computer Interaction (HCI) theories are concerned with transforming the requirements of any system into a conceptual model. They defined it as fundamental to the interaction design. One reason is because there is no definitive detailed characterization of the conceptual models, because they take many different forms, and the conceptual design makes it easier to understand by exploring different approaches to it (Rogers, Sharp, & Preece, 2007). In web systems, the conceptual design illustrated the system components and functions (McCrindle, 2005). Fig 7.6 illustrates the suggested conceptual design of the prototype under research.

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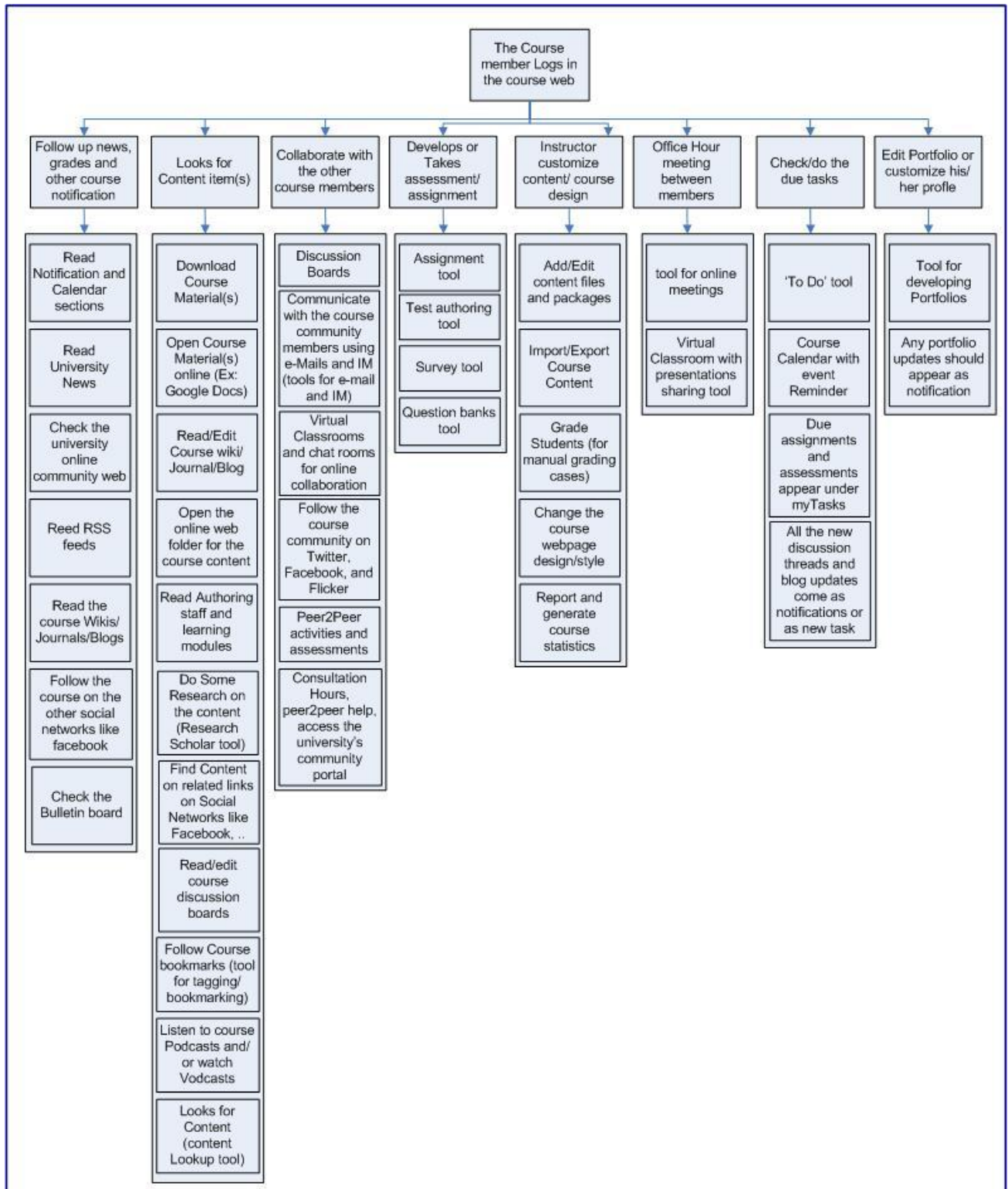


Figure 7-6: The conceptual design of the course system prototype.

7.10 Paper Prototype

Snyder (2001) stated that “paper prototyping” is useful for gathering data about concepts and terminology, navigation/workflow, content, page layout, and functionality. In this research, the paper prototype is conducted to gather data about the design of the new online course system, which contains a representation of all the mentioned issues by Synder.

Since it will be a learning environment for students, it makes sense to design the course website to be student-centred in terms of content access, community activities, assessment, collaboration, and notification. The user-centred design process focuses on developing software that meets the users’ expectations (Rogers, Sharp, & Preece, 2007). User-centred systems have many methods of prototyping new designs. One main method is paper prototyping. As mentioned by Rogers (2007), paper prototyping is a method of usability testing that is useful for websites, Web applications, and conventional software. In this research, paper prototyping will be conducted to design the course system based on user needs and wishes and for ease of use. The paper prototyping started on paper by sketching an initial design, then it was designed on the computer using the design package Adobe Photoshop to give it a clear sense of the computer interface and website design. Then the computerized version was offered to twelve university students and instructors from the surveyed group in the first and second surveys with a detailed explanation of all its functionalities. Then the users were asked to use it and report whether the design satisfied the following points:

- Has enough functionality to make the learning process easy and motivating
- Includes the most desired functionalities by the university users
- Collects many of the socialization activities besides the course work activities
- Makes it easier for instructors to keep the students engaged in their learning
- Facilitates course content development for the instructors
- Benefits other users (such as management staff and students’ observers) with sufficient and a proper notification system with a variety of notification ways.
- Reflects new pedagogical styles in HE
- Supports the mobile learning
- Clear and easy to use

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Once the user requirements, content, and features were mapped out, it was easy to design the first iteration/version of the prototype. Figure 7-7 illustrates the electronic version of the initial prototype of the suggested online course system.



Figure 7-7: The initial prototype of the suggested online course system.

7.11 Heuristic Evaluation of the Initial Version of the Prototype

Nielsen and Molich (1990) and Nielsen (2005) defined heuristic evaluation as a method by which a group of usability experts are involved to evaluate the user interface separately, one-by-one. They apply a set of relevant design guidelines, called heuristics. In this stage of evaluating the usability, no representative users are involved. When the involved experts address certain usability issues, these issues are collected, combined, ranked, and prioritized for iterative redesign of each discovered issue. This process of early discovery of the obvious usability issues has the advantage of reducing the design usability testing cost in terms of time, people, and money before offering the system to

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the end user for many user tests. The usability experts are usually concerned with the final user interface, which should be, as per the expert opinions, easy to grasp by novice users of the system. In this research the heuristic evaluation was conducted during the data collection stage by usability experts. They applied a set of heuristics and design guidelines for initial evaluation, which included the following (extracted from Militello, 2000):

- **Flexibility and efficiency of use:** through which the system can cater to the novice and experienced users and allow them to tailor frequent actions
- **Aesthetic and minimalist design:** ensures that the interface and screens do not display any irrelevant information.
- **User control and freedom:** through which the user can use the proper action and have an emergency exit in case of choosing a wrong action
- **Consistency and standards:** whereby the system follows the platform conventions and does not use different wording or technical language from similar systems
- **Match between system and the real world:** whereby the system uses the same language (of education) as the users in the real world and does not use system-related words
- **Recognition rather than recall:** whereby use of the system does not need a high level of memorization from its user. (The user should not need to recall or memorize certain information to be able to use the system. Instructions of using the system should be visible or easy to detect, understand, and retrieve whenever appropriate.)
- **Help and documentation:** available and easy to search, although the system can be used without help and documentation.

Usability experts applied the above heuristics and discovered some issues in the initial version of the prototype design. The issues were covered before undergoing usability testing with the user representatives.

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7.12 Prototype development process

A series of prototype versions were developed to ensure satisfaction of user needs and build on a consensus between the maximum number of users from the nominated sample. Step-by-step, the user requirements were developed into new functionalities. Figure 7-8 depicts the evolutionary approach in developing these functionalities through the different versions of the prototype.

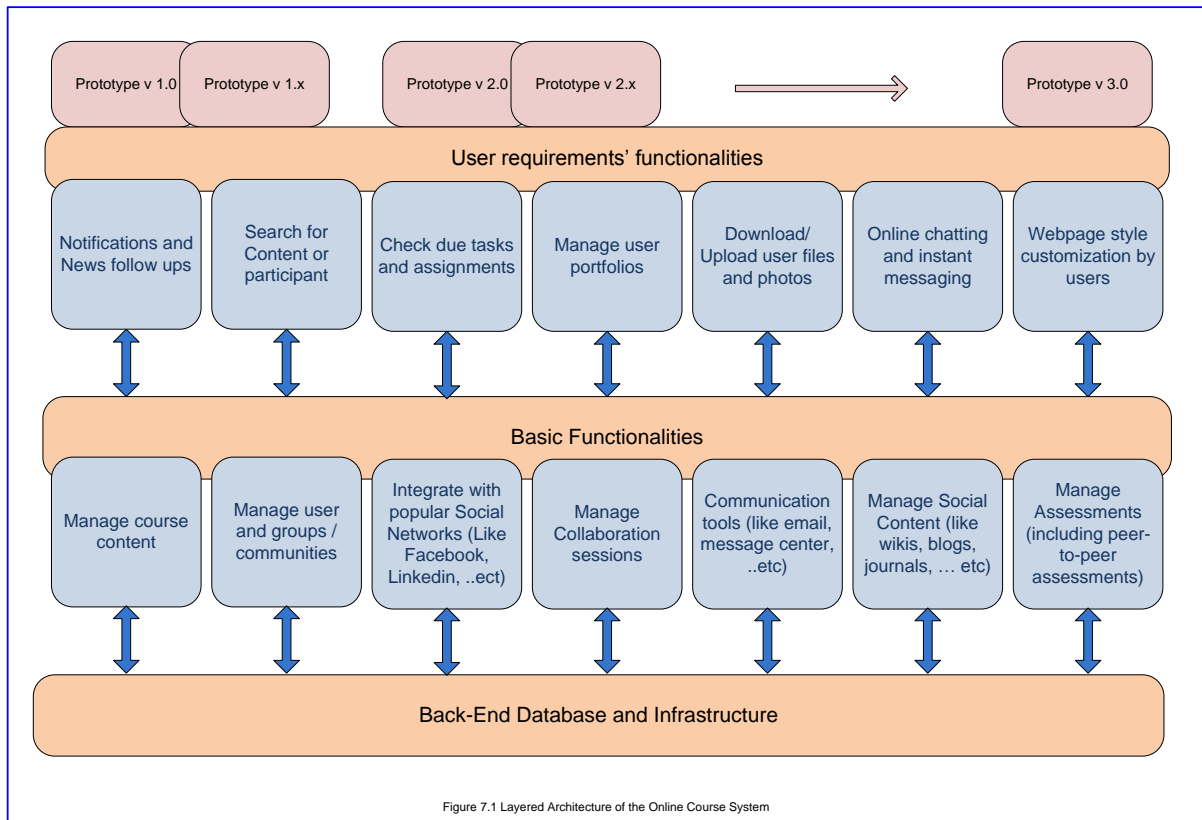


Figure 7.1 Layered Architecture of the Online Course System

Figure 7-8: The evolutionary approach in developing the system functionalities.

As shown in Figure 7-8, the online course system facilitates seven basic functionalities including content management, user management, integration with a set of the known SC platforms, collaboration sessions, communication tools, SC content items, and assessment management. Each functionality works as a basic task that the system will facilitate and might represent the basic functions of the online course system. In addition to these functionalities, and as per the user requirement analysis, an additional layer of

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functionalities will be defined to enrich the system with more social functions. These functions include the following:

1. All types of notifications (IM, announcements, RSS feed updates, microblogging services, due tasks and calendar events, and all the other social networks' notifications)
2. Data mining tool. A tool for intelligent and quick search to discover all the system content and the other websites' content
3. Create, edit, and manage user profiles (For example, a student profile might be created to collect personal information, academic information, achievements, photos of the student, and projects the student does. It might be called student portfolio to be more comprehensive.)
4. Content area for each student in which the student can manage his or her class files and other owned files.
5. Online collaboration session manager, usable by the instructors and students to chat and/or manage virtual classrooms, distance learning sessions, and office hours/makeup lessons.
6. Control option over the course webpage style for customizing the look and feel of the system in an acceptable view to ensure more motivation and affinity among student users.

The following table (table 7.2) illustrates the change in the proposed system functionalities over time from version 1 through version 3. These changes were defined based on the collected data during the usability analysis with the end users.

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Table 7.2: Prototype functionality changes over time

Prototype version 1 (Suggested Functionalities)	Prototype version 2 (User-Defined Functionalities)	Prototype version 3 (Tested and accepted functionalities by end users)
Easily find information about their courses online on their social media networks profiles, microblogging tweets, RSS channels, or on their mobile and movable devices	Downloading/uploading class materials	Upload/download course content files
Keep informed with any course updates either in content or any other news, including new assessments and grades	Engaging in the online discussions and collaboration sessions	Develop discussion forums and make it easier for instructors to grade the student posts on it
Find course resources like vodcasts and podcasts on the internet easily	Adding/checking new notifications and course announcements	Create blogs and wikis and grant the students the privilege to edit and develop their content
Customize the learning styles, or schedules as per the user convenience	Following up calendar events	Instructors can import content from the SC websites including YouTube, flicker, and the other mashups websites
Contribute in developing the course content through editable course wikis and journals to feed their experience to their colleagues	Taking/developing a variety of assessments including tests, surveys, and assignments	Assign students access to online office applications such as Google docs within the course content areas
	Checking subject grades and performance reports	Add RSS feeding channels to the course and assign students separate areas in which to comment or ask about its feeds

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Table 7.2: Prototype functionality changes over time (Cont'd)

Share content and exchange files with colleagues	Working with colleagues online on projects and other course work that use online software such as online presentations and docs	Link the course content with the virtual web environments like Second Life to make it easy for instructors to virtualize some course activities when needed and support student learning and imagination through virtual reality worlds
Access information and informal learning	Watching vodcasts, listening to podcasts, or downloading similar files	Add media sharing websites and content like podcasts and vodcasts to the course
Users engage in communities and express themselves with the others	Editing journal entries, editing wikis, or typing in a blog or microblog	Tag some website and add it to their favourite lists
Foster group collaboration and help in achieving project work	Doing activities that are required by their instructor, for example, locating certain content on YouTube, Second Life, and similar useful sites	Socialize with their colleagues teaching the same course to discuss more about the course-related issues like course times, course topics, assessments, course events, and course content
Help instructors to support students with additional learning materials and resources	Defining bookmarks and tagging useful websites as learning resources, which helps them to customize their learning by extending it beyond the predefined course content to include interesting resources from their choice	Add content files, add notifications, edit content modules, upload assignments, add/take assessments, check for grades, deploy course surveys, and communicate with the other people in the course.

7.13 Final Design Iteration of the Prototype

During meetings with the instructors and students, the proposed tools and features were clearly defined with a focus on how it will be used by the user. It has taken some time to explain how the design will support the user goals and illustrate that by sketching, iterating, and discussing the user ideas. The discussions focused on how to develop the suggested ideas with a proper design and to guarantee user satisfaction and comfort with regard to the design decisions and the interface of the system.

The design was iterated three times with versions 1.0, 1.1, and 1.2. The revisions included minor changes in the design style and colours. Then version 2.0 was defined with changes in the system functionalities. Figure 7-9 shows version 2.0.



Figure 7-9: The prototype design, version 2.0.

More ideas were contributed to enhance the interface design. These ideas included changes of colours, adding known brand logos, and extra functionalities. The new added functionalities included notification boxes and a Social Hub, which will collect, related

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announcements from various sources to save users time and avoid lower ratios of signal-to-noise. More sketching was conducted to iterate newer versions of the design. The last developed iteration was version 3, which is shown in Figure 7-10.

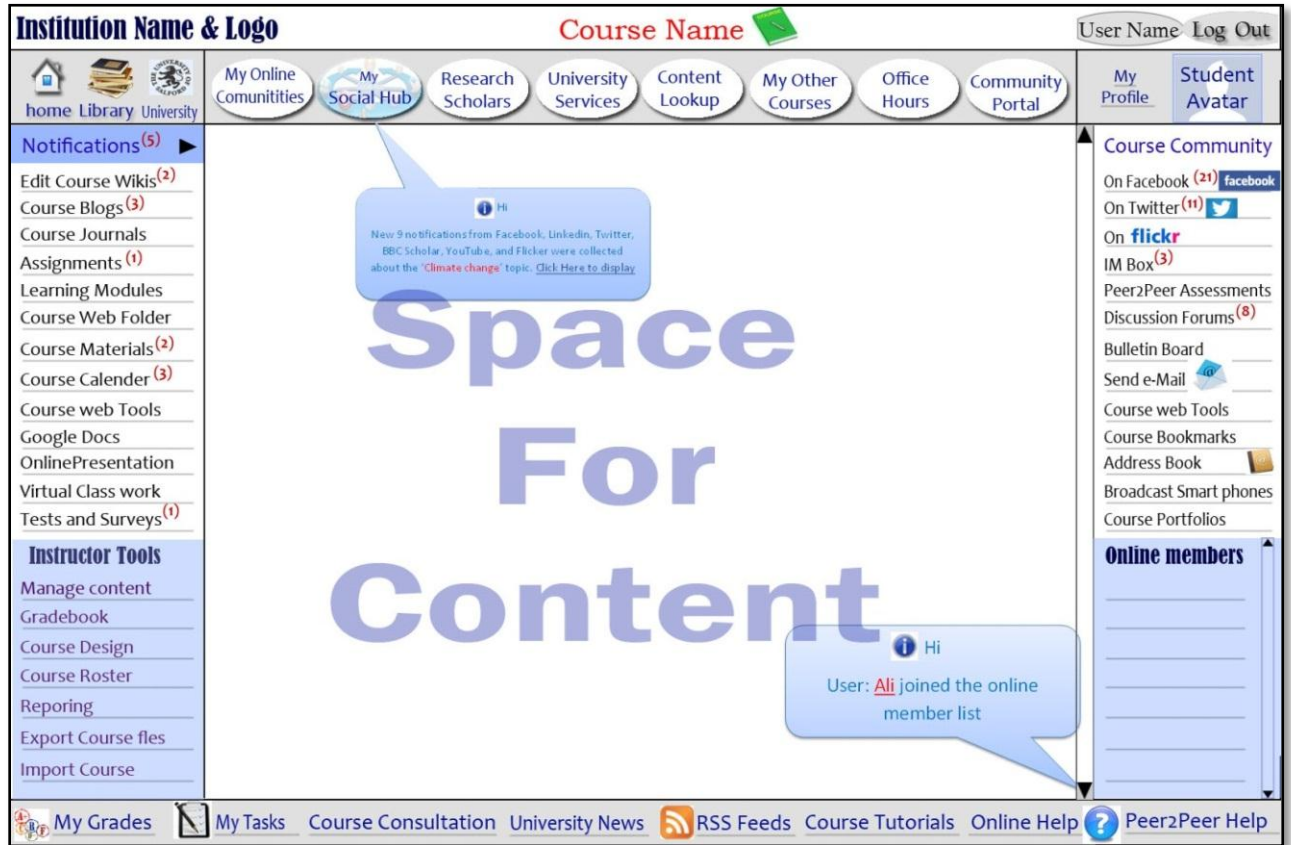


Figure 7-10: The prototype design, version 3.0.

Version 3.0 was retested with three instructors and three students to confirm consistency between user opinions of how it could enhance the user experience with the system comparing it to the previous versions. The users agreed on that consistency, which was evaluated by the researcher and considered as enough of a sample for initial usability testing of that version of the prototype.

The final design of the prototyping process, with a full example of the expected design elements on the system screen, is provided in Figure 7-11. The screenshot demonstrates the course design of a sample course (macroeconomics course) conducted in a sample university (University of Salford).

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The screenshot shows a web application for 'Macro Economics SP1 (ID: ME201120)' at the University of Salford. The user is logged in as 'Karen'. The interface includes a top navigation bar with various links like 'My Online Communities', 'My Social Hub', 'Research Scholars', 'University Services', 'Content Lookup', 'My Other Courses', 'Office Hours', and 'Community Portal'. A left-hand menu lists 'Notifications (5)', 'Edit Course Wikis (2)', 'Course Blogs (3)', 'Course Journals', 'Assignments (1)', 'Learning Modules', 'Course Web Folder', 'Course Materials (2)', 'Course Calendar (3)', 'Course web Tools', 'Google Docs', 'Online Presentation', 'Virtual Class work', and 'Tests and Surveys (1)'. Below this is an 'Instructor Tools' section with links for 'Manage content', 'Gradebook', 'Course Design', 'Course Roster', 'Reporting', 'Export Course fles', and 'Import Course'. The main content area features a 'Welcome to the MERIT Community!' message from Sarah Ricketts, dated December 20, 2011 - December 27, 2011. It provides contact information for Sarah Ricketts and Vian Ahmed, and links to support pages. A second message from Sarah Ricketts discusses 'The Library and Computing Services', providing contact information for Maggie Smart and links to library resources. A right-hand sidebar includes 'Course Community' with social media links (Facebook, Twitter, Flickr), 'IM Box (3)', 'Peer2Peer Assessments', 'Discussion Forums (8)', 'Bulletin Board', 'Send e-Mail', 'Course web Tools', 'Course Bookmarks', 'Address Book', 'Broadcast Smart phones', and 'Course Portfolios'. Below this is an 'Online members' list with names: Sameer, Naser, Mohamed, Chris (Instructor), Lubna, Jasmine, and Khaled. A blue notification bubble in the bottom right corner says 'Hi User: Ali joined the online member list'. The bottom navigation bar includes 'My Grades', 'My Tasks', 'Course Consultation', 'University News', 'RSS Feeds', 'Course Tutorials', 'Online Help', and 'Peer2Peer Help'.

Figure 7-11 The prototype design: expected screenshot.

7.14 Analysis of the Final Version's Content and Features

The suggested design follows the user-familiar theme webpage with a menu on either side of the page. It matches some daily-use programs and websites such as Microsoft Outlook and Amazon.com. The left-hand side menu includes all the links that are related to browsing, displaying, adding, or editing course content. It contains a unified course menu that can be accessed by any course member. Underneath the menu there is an area for Instructor Tools, which will be displayed only for the users with the “instructor” role. This gives the instructor control over the course content with the possibility to grant extra permissions to the other user roles, such as student. On the top of the left-hand side menu, links to the other learning resources such as Library and the main university portal website are displayed to facilitate access to all the available learning resources and content.

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At the database level, it is supposed that every course member will be assigned a course role (e.g., student, instructor, observer, teaching assistant, grader, guest), which defines the user's default privileges in terms of content access and browsing course items.

The right-hand side menu displays all the communication, collaboration, and other SC tools. It also has an area for online chatting, which displays any online course member. Every member can customize his or her profile to edit personal information, profile settings, and online status, that is, the course members can change their status to offline if they are not interested in showing themselves to be online. The user might make himself/herself showable for some members only. Any of these tools could be controlled by the instructor (the course leader) to make it available or not for the fewer-privileges roles, such as "student." AT the top of the right menu, the course member might define an avatar to represent himself/herself to others.

The central content area displays whatever has been selected from the course menu items. At the top of the content area, the course name and ID are displayed to identify the whole page. There is a top bar that displays useful tools like "My other courses," which displays the list of courses that the course member is enrolled in. it allows the course member to switch to any other course he or she is registered in. There is also "My social hub," which provides access to notifications from different sources and websites and allows the user to filter them using keywords and to link them to certain topics. The keywords might be defined from the notification metadata or as per its subject. The Social Hub helps in minimizing the number of access times to the notification section and avoids higher ratios of noise. It also collects many notifications together which is expected to increase the signal ration and add to the learning resources for the students. Another link for a "research scholar," which displays the "scholar website" for searching inside scientific libraries and journals, will help students find extra learning resources. Another search tool, "Content Lookup," will appear depending on a data mining tool that looks inside the whole system's database for any given keyword.

Some other useful links are for the central university IT services ("University Services"), for the university public web portal ("Community Portal"), for course office hours "Office Hours," and for links to initiate online virtual classrooms during these

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hours (“My Online Communities,” which displays the other pre-defined communities that the course member is in). “My Profile” can be used to edit the member’s profile.

In the bottom of the course webpage there is a link bar that contains extra useful links for course tutorials, peer-to-peer help, online help from the system administration staff, school events and news, and “RSS feeds,” for any pre-defined feeds either from the instructor as course leader or by the login member. It also includes a “My tasks” link, which displays all the tasks that were identified for that member, either by assignment of instructor or even self-defined, and issues reminders.

In general, the proposed design aims to make it easier for course members to find important links easier. This makes the look and feel logical for users and easy to understand, even without prior training on how to use it.

7.15 Infrastructure and Requirements to Implement the Prototype System

The new course system requires three tiers of infrastructure. The first tier includes the front-end web server(s), which receive(s) client requests and distinguish(es) between the two types of requests. These two types are:

1. Request on the webpage itself, by browsing and selecting its items. Such requests could be answered by the web server itself with no need to move to the other tiers.
2. Requests that collect data from the database system. Examples include grades, student enrolments, and due assignments. Such requests will be forwarded to the next or the second tier.

The first tier might include one or more web servers according to the system implementation analysis, which includes the definition of the number of users, number of online courses or course sections, the expected number of concurrent sessions, and number of the user hits. In case of multiple webservers, a load-balancing switch could be installed in the front of the first tier servers to distribute the load on the different servers and balance it in order to achieve optimum system performance.

The second tier includes the database server(s). This tier might include one or more database servers as per the institution size, the expected number of hits, and user concurrent sessions. In case of multiple database servers, a clustering technology could

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be used, and this is available in most of the enterprise database systems like ORACLE and MS-SQL server. The database cluster ensures high system performance and reporting.

The database server stores the data records that include links to any content file or package. The content files and packages are stored on a third tier of storage servers. The third tier includes a storage server such as the storage area network (SAN) servers, which could be configured to include a hard disk array that hosts the whole system's content. The hard disk array should be configured as per the implementation analysis that defines the institution needs. The advantage of extending the number of hard disks in the array is that it could be expanded relatively easily, especially when uploading heavy content files like high-quality videos and audios.

In front of the first tier and between the second and third tier, a firewall system will be installed to guarantee a secure environment. The idea behind the whole configuration is to develop a scalable and rich online learning model. An expert will evaluate the prototype and its needs for implementation to guarantee validity and system reliability. Figure 7-12 illustrates the three tiers and the whole architecture, which takes advantage of the latest technologies available today for the enterprise web-based systems.

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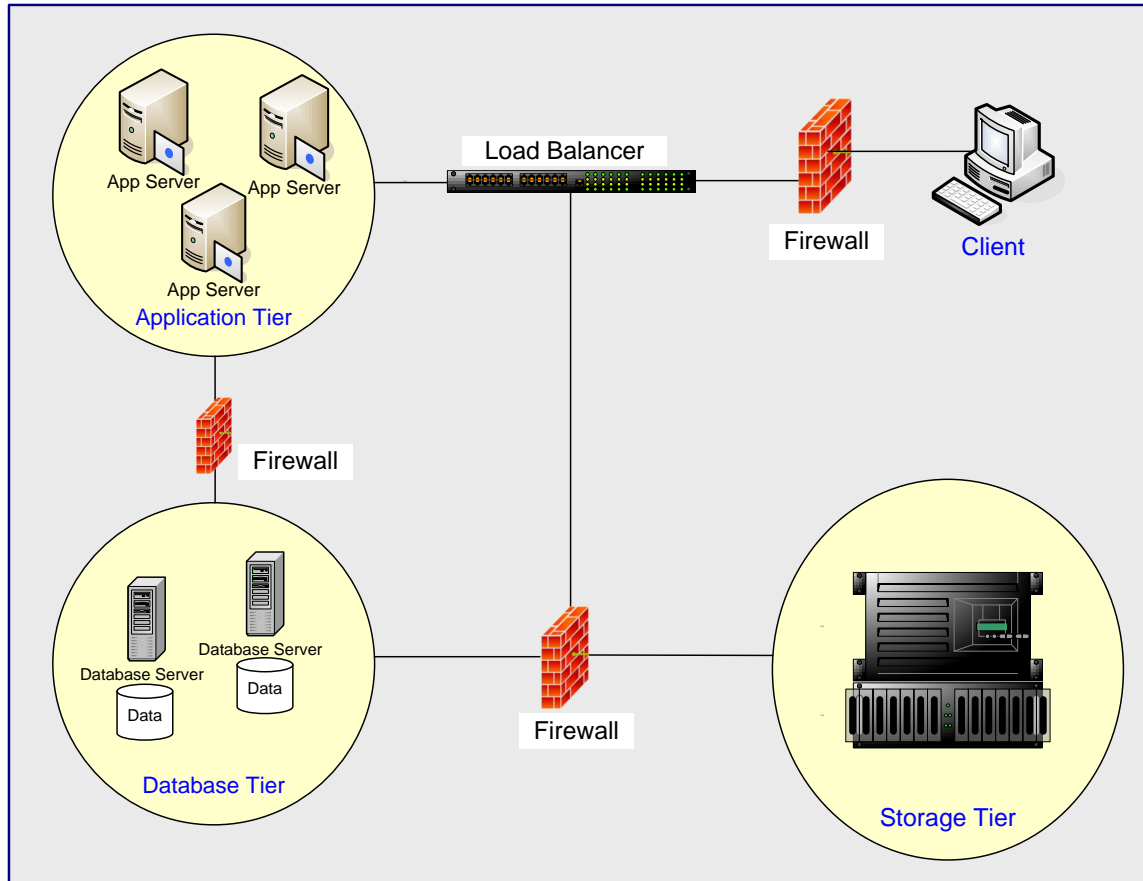


Figure 7-12: System architecture for the online course system (OCS).

7.16 Validation of the Prototype

The validation of the prototype comes from validating the system; or by another meaning success of the system itself. On the other hand, successfully validating the prototype will lead to validating the conceptual framework itself, that is, the process of validating the framework will go through an intermediary step of validating the prototype first, which comes from validating the system itself. Figure 7-13 shows the whole validation procedure.

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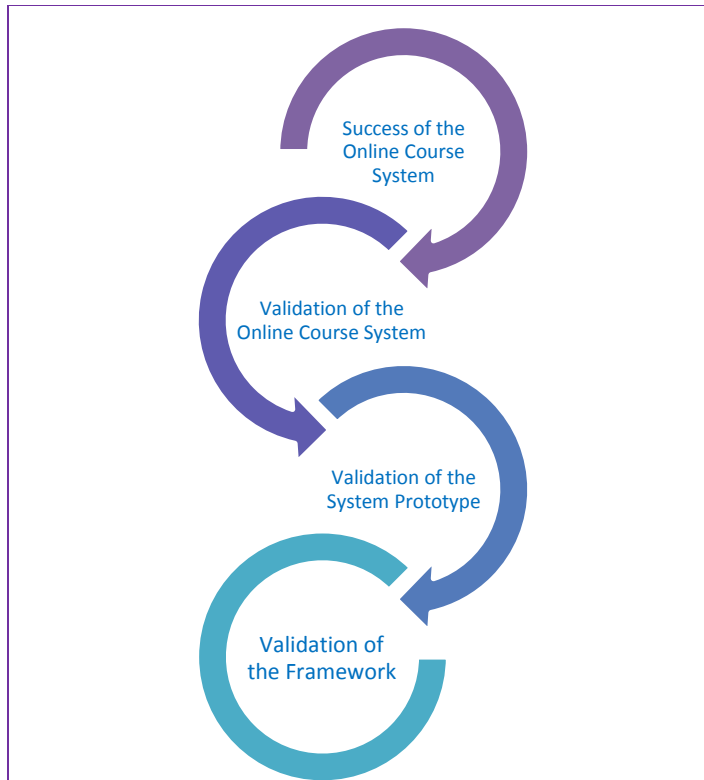


Figure 7-13: The validation procedure.

In this research, the validation process will go through validating the prototype itself after developing it and testing it with users. The conducted steps in validating the prototype are discussed in detail in Chapter 8 of this research.

7.17 Summary of the chapter

The user acceptance of the new offered online course system depends, not only on the acceptance factors defined in the proposed framework, but also on the design sense and easy-to-use options. So prototyping the course design is an important step in developing a coherent model of using the SC tools for the daily learning activities of the university. In this chapter, the offered course design considers the logic behind the use of SC (i.e., to socialize and collaborate with others) in the educational setting. It offers the users the possibility to stay engaged continuously with their colleagues, to socialize with them, to communicate easily, and to carry out the basic course work by browsing content, taking assessments, submitting assignments, accessing performance reports and grades,

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and so forth. The proposed prototype helps in validating the conceptual framework. The next chapter includes full details about measuring the system's success, which validates the prototype itself and consequently validates the conceptual framework.

Chapter 8
Framework Validation

8.1 Introduction

In this research study, chapter 6 included the development of theoretical framework for implementing SC technologies in HE in the Gulf States. Chapter 7 included a pragmatic validation of that framework through the development of a new system prototype for an online course system (OCS), which embraces a subset of functionalities that were developed by deploying the constructs of the conceptual framework. The prototyping process utilized the data gathered from the HE stakeholders that are related to the pragmatic aspects of the prototype design, development, and implementation of the related issues within the case study institutions that represent the HE environment in the Gulf States.

The prototype was developed as a model for harnessing SC tools in the course management systems. Furthermore, the prototyping itself included pragmatic data gathering from stakeholders in the case study institutions. In this chapter, the validation of the prototype, which is consequently validation of the theoretical framework, is discussed.

In this research it was important to consider the validation of all its stages to address the complexity of developing a new information system based on psychological factors. This necessitated that the validation to be built into all the research stages, through continuous review of the literature and through user involvement in the prototype development process. At some points, relevant built-in validation activities were conducted before moving to the next step. Figure 8-1 illustrates the continuous validation and verification process during the development of the current research study.

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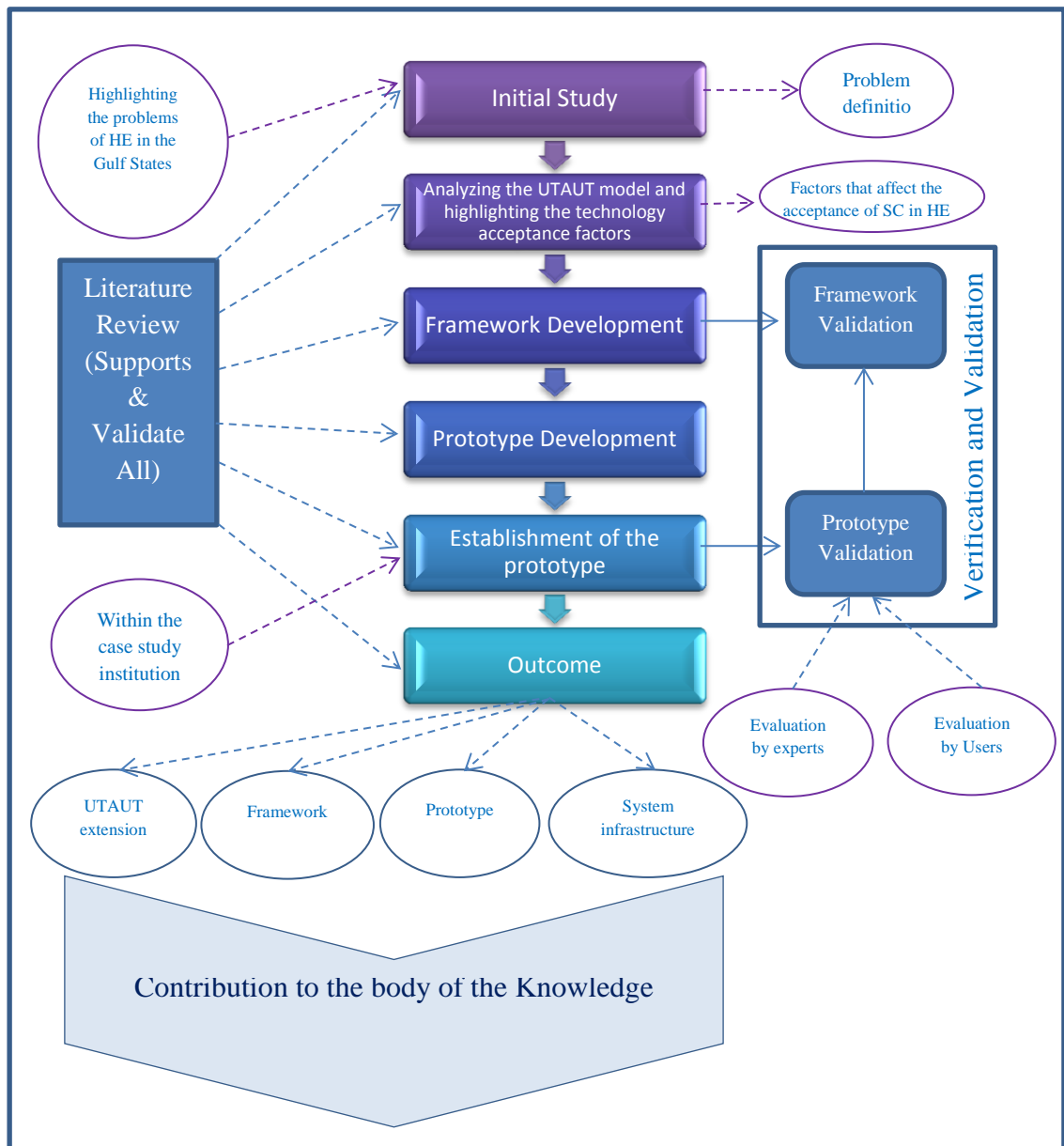


Figure 8-1: Continuous validation and verification

8.2 Validation of the System Prototype

Many researchers conducted early attempts to define information systems (IS) success, but unfortunately they were ill-defined due to the complexity of IS and to its multidimensional nature. Delone and Mcleans addressed this issue through reviewing the published research during the period from 1981 to 1987 and developed a taxonomy of IS success based on their review. They released their paper about the components of IS success at 1992, which included the definition of the six variables as the components of the IS success. These variables are system quality, information quality, use, user satisfaction,

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individual impact, and organisational impact. They defined these variables as interdependent and not independent success measures. Figure 8-2 shows the model of Delone and Mcleans (1992), which was the original model of measuring the IS success. Shortly after that, the IS researchers started working on proposing modifications on Delone and Mcleans's model.

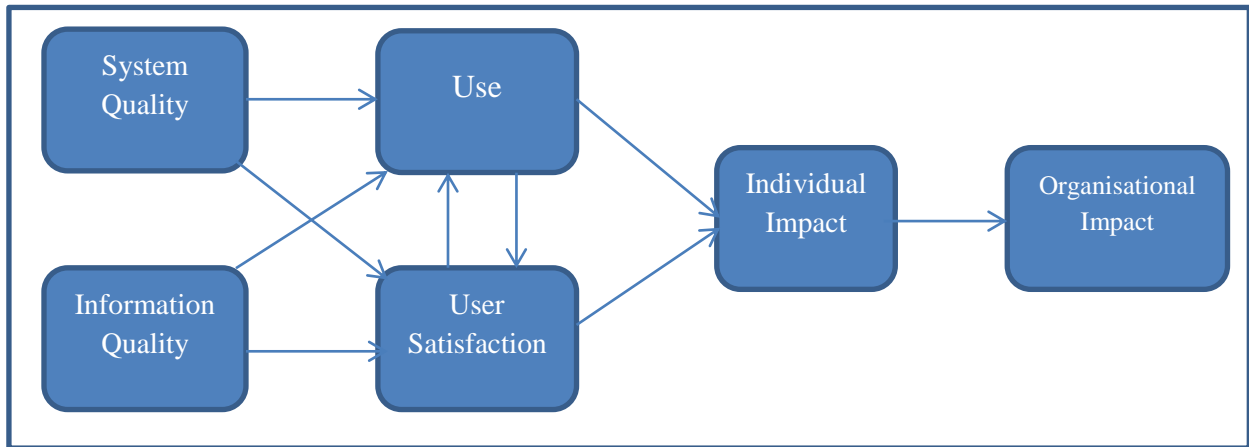


Figure 8-2: IS success model by Delone and Mcleans (1992)

Delone and Mcleans's (1992) model was published as the initial model for validating information systems (IS), which was considered by many researchers for testing and validation. Other researchers have different opinions and have offered great criticism of the model. For example, Pitt et al. (1995) considered that the importance of the relationship between the user and information service department was increasing and, consequently, an additional construct, the service quality construct, should be considered and added to the model. Seddon (1997) argued that Delone and Mcleans's model included process and variance variables, which generate confusion when describing, evaluating, and analysing the results. Myers et al. (1997) and Peter et al. (1999) argued that the model was addressing individual benefits and organisational benefits but missing community benefits and industry benefits.

These criticisms urged the researchers to work again to improve on the model. Delone and Mcleans (2003) continued their research on enhancing their model and after ten years of publishing their initial model, they revealed that the quality of the system should be

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measured as well, and they divided the quality of information systems into three major dimensions: system quality, service quality, and information quality.

Each of these dimensions should be measured in terms of their effect on the use of the system and user satisfaction. These dimensions expanded the model of Delone and Mcleans (2003) to include six major characteristics for validation: (i) use, (ii) user satisfaction, (iii) net benefits, (iv) system quality, (v) service quality, and (vi) information quality. Then they defined subcategories for each characteristic and defined them as associated variables for it. Figure 8-3 displays the six characteristics of measuring the success of IS and their variables.

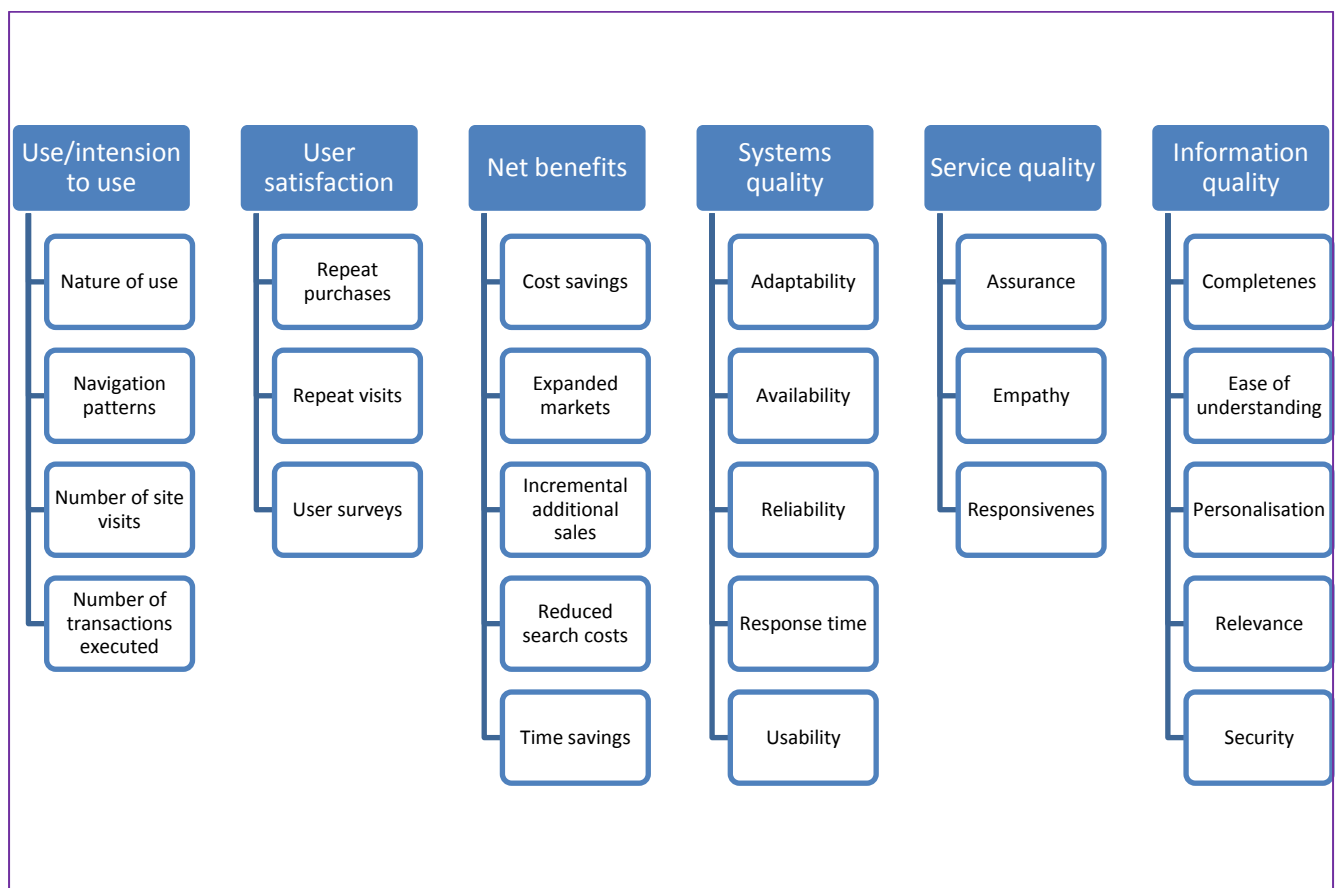


Fig 8.3: the variables of measuring the success of IS

During the last years, many researchers developed many methods to validate information systems that all were based on discussing the accuracy of Delone and Mcleans's (1992, 2003) models. Wu and Wang (2006) used the second model of Delone and Mcleans to measure the success of web-based information systems and they confirmed that a successful

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measurement was achieved using the illustrated characteristics in Delone and Mcleans's (2003) model. Although the successful attempts by Wu and Wang (2006) and some other researchers who also worked on developing validation methods for information systems are encouraging, there is no totally accepted system for validating information systems (Mahindu, 2009).

In this research, a mixed method of validation will be employed, through combining a set of validation methods derived from the literature. These methods include the system success measurement characteristics that were defined by Delone and Mcleans (2003), plus a heuristic evaluation and usability testing.

8.2.1 Measurement of System Success

The validation of the prototype comes from validating the system, or in other words, by the success of the system itself. In this research, it was a clear obstacle to develop the online course system (OCS) with full functionalities, because it might need individual project of enterprise level. This can be future work for the researcher in partnership with other researchers and/or sponsors. So, since the idea behind developing the system prototype was to simulate the targeted functionalities on a small scale, to test user acceptance and satisfaction of the system functionalities, it makes sense to measure the success of the system through the acceptance and validation of its prototype; that is, the success of the suggested course system will be achieved through the user acceptance and satisfaction of the prototype, which by consequence leads to validation of the framework.

As introduced in chapter 7, the infrastructure required for implementing the OCS system includes certain web-based technologies. The prototype is developed using the same technologies. This forwards the sense toward validating the prototype using the testing characteristics proposed by Delone and Mcleans (2003), except for some variables such as "repeat purchases," which is not applicable in the case of prototyping for piloting. The six characteristics of validation and their variables that are suggested by Delone and Mcleans (2003) are discussed in the following sections, which consider the implementation of the system inside the case study institutions.

- **System Use.** Straub et al. (1995) defined system use as one of the most frequently assessed factors when measuring the success of an IS. In the context of web-based

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information systems, two types of use are very common, information sharing and information acquisition and utilization (SaS, 2007). System use was also pointed out by Seddon (1997) as a good proxy for measuring IS success. It was also defined as a key variable in understanding the success of IS by DeLone and McLeans (2003; 1992) and Doll and Torkzadeh (1998). The system use defines whether the developed system functionalities achieve their intended purposes. Thus, in this research “system use” is considered an appropriate measurement tool for the success of OCS.

- **Intention to use.** This is a variable that refers to the prediction of the user desire to employ the system. Davis (1993) and Lederer et al. (2000) mentioned that the intention to use is worthwhile only when system use is difficult to assess. They considered it an important measure for measuring the success of the knowledge systems more than the other systems. So, in this research, the intention to use can be dropped from the success model of the system prototype.
- **User satisfaction.** Seddon & Kiew (1996) studied the IS success model of DeLone and McLeans (1992) and came up with a new four-item instrument to measure the user satisfaction regarding the IS. In their evaluation they changed the construct “use/intention to use” to “usefulness of the system,” which was originally equivalent to “perceived usefulness” in the TAM model by Davis (1989). They suggested adding service quality to the DeLone and McLeans model and they worked with other researchers to develop a new instrument called SERVQUAL, which continues as salient within the literature of measuring the IS success during the period 1997 to 2007. SERVQUAL mainly measures the service quality of an IT department and the implemented services and systems within it. Pitt et al. (1995) evaluated SERVQUAL and recommended adding the service quality to the D&M model. A great debate between researchers was on-going between 1997 and 2003 until the new model of the D&M was published. DeLone and McLeans (2003) included these four items of Seddon & Kiew (1996): system quality, information quality, user satisfaction, and perceived usefulness. So, user satisfaction became an important aspect of measuring the success of IS. In fact, when users confirm that they like a certain system it becomes difficult to deny the success of that system. Thus user satisfaction is highlighted as important measure of the success of any IS.

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Thus, in this research the user satisfaction was included in measuring the success of the system prototype. The researcher developed a new tool for measuring the four items of Seddon and Kiew (1996) plus the system use. The tool and its reporting are attached to this thesis in Appendix 5. While Figure 8-4 shows the overall picture of the five dimensions based on the collected feedbacks of users, Table 8-1 provides a summary of the collected feedback using the measurement tool.

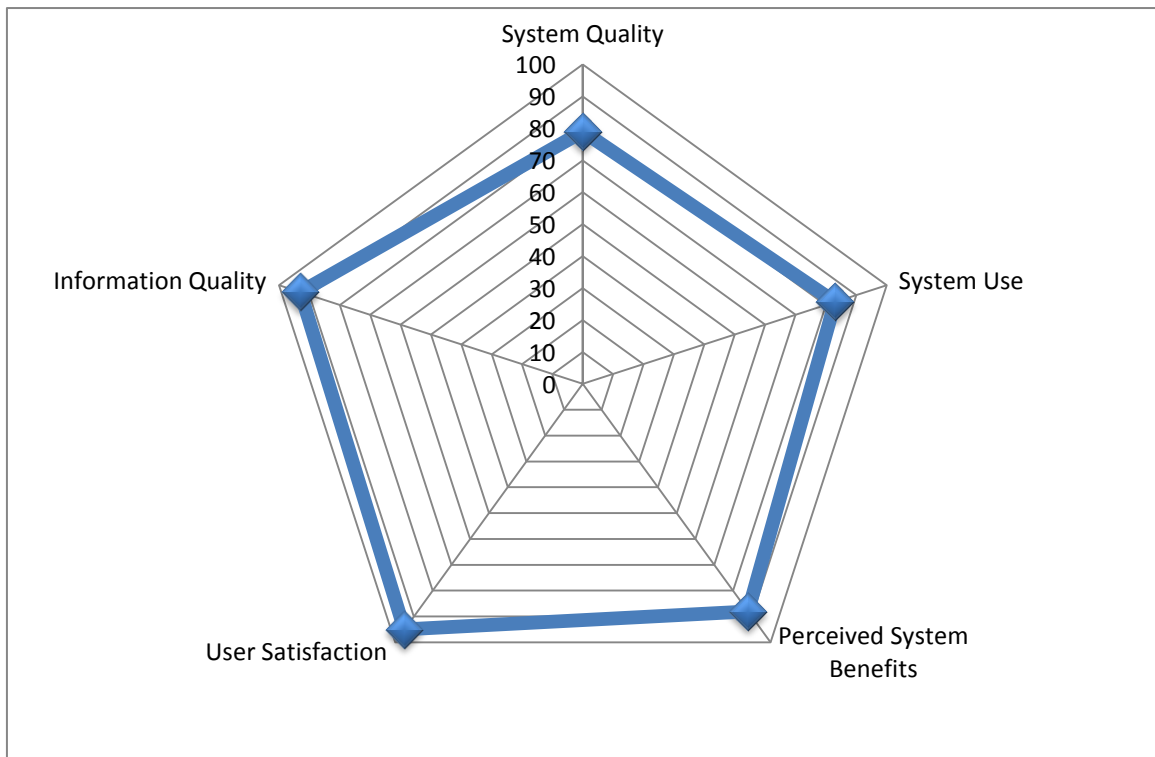


Figure 8-4: summarized picture of the system prototype success.

Table 8-1: summary of the collected feedback from the users about the five success measurement dimensions of OCS as an IS.

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Dimension		%
System quality: How good the OCS is in terms of its operational characteristics?	OCS is easy to use	85%
	OCS is user friendly	90%
	OCS is stable	70%
	The response time of OCS is acceptable	81%
Information Quality: How good the OCS in terms of output.	OCS makes it easy for me to upload/download course content items (files, folders, discussions, .. etc)	95%
	The interface words and phrases provided by OCS are clear and consistent	90%
	The representation of the content provided by OCS is logical and fit	84%
	The content or information provided by OCS is important and helpful for my work	96%
	The content or information provided by OCS is organized in meaningful, understandable, and practicable way	95%
	The content classification in OCS is clear and unambiguous	80%
	OCS provide contextual content or information so that I can truly understand what is being accessed and easily apply it to work	91%
	OCS provide complete learning portal so that I can link to content or information sources	96%
	OCS provides accurate expert course page	85%
	OCS provides educational social content items which benefits the class community in collaboration and facilitates content sharing.	90%
User Satisfaction: the user's pleasure or displeasure of the OCS	OCS provides customizable learning environments	92%
	I am satisfied that OCS meets my information processing needs	90%
	I am satisfied with OCS efficiency	66%
	I am satisfied with OCS effectiveness	71%
Perceived benefits of OCS: the valuation of OCS by the users	Overall, I am satisfied with OCS	82%
	OCS helps me acquire innovative ideas	92%
	OCS helps me effectively to store information that I need	88%
	OCS enable me to accomplish tasks more efficiently	88%
	My performance in study is enhanced by OCS	96%
System Use: the extent to which the OCS can be used	OCS improves the quality of my work life	92%
	OCS can help me to learn any time	96%
	OCS can facilitate my assignment work and uploads	99%
	OCS can be used to communicate my learning information with	96%
	OCS can be used to share my general learning information	96%
	OCS can be used to share my specific learning information	96%

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8.2.2 Validation of the prototype with Heuristic Evaluation within the Case Study institutions

Other validation methods include heuristic evaluation to include expert user feedback and enhance the prototype design accordingly. Then usability testing with a group of interviewed users in the stage of data collection will be conducted to ensure meeting their expectations, a clear understanding of their real needs, and translating them into practical application. The discussions with those users during the usability testing stage leads to avoiding any bias that might be developed during the data collection stage. Figure 8-5 summarizes the heuristic evaluation and the usability testing methods of the prototype validation process.

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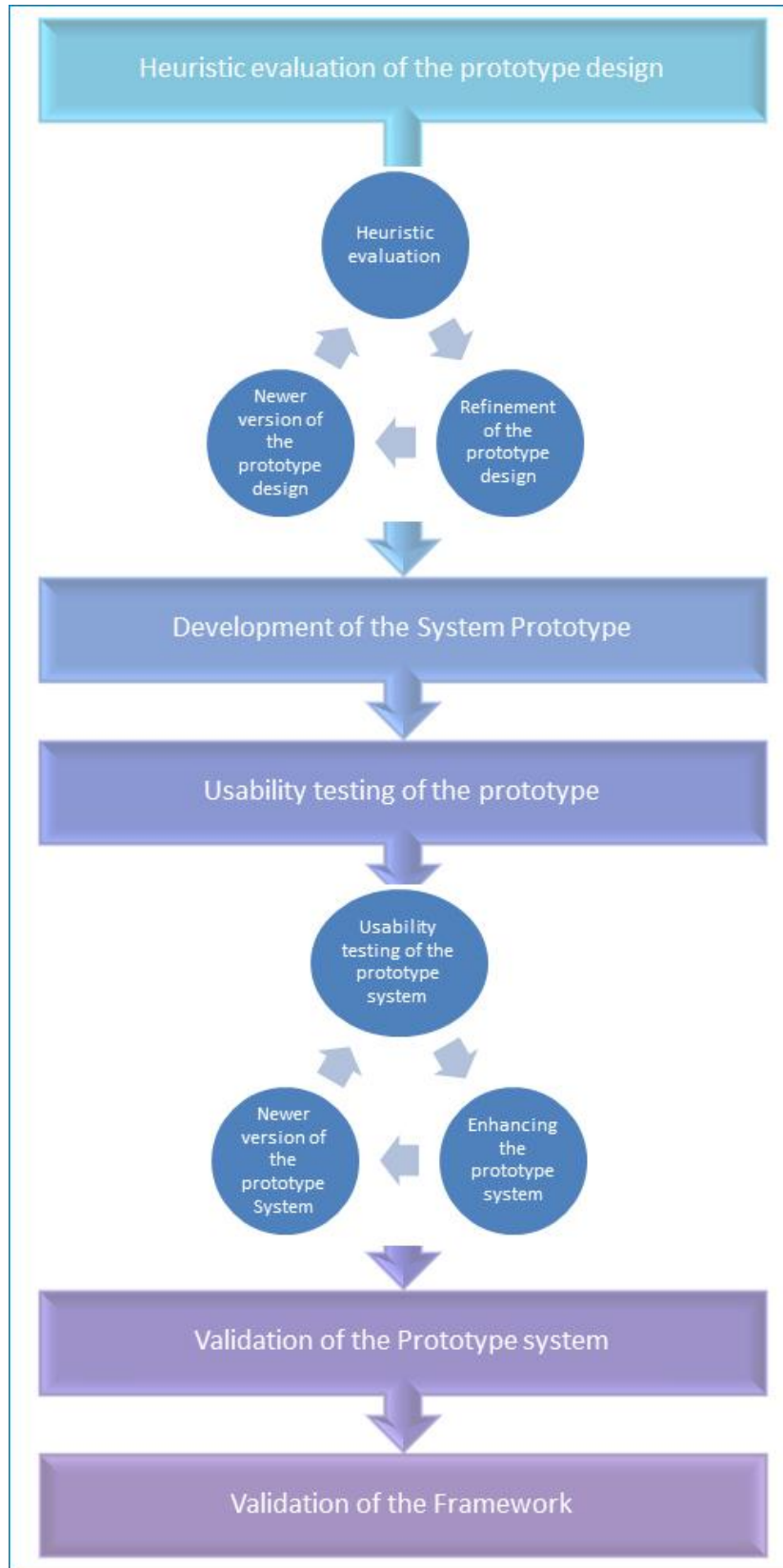


Figure 8-5: the Framework validation process

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8.2.3 Heuristic evaluation of the prototype

The heuristic evaluation was introduced in chapter 7 as part of the prototype development process to ensure successful development and reliability of the prototype design and functionalities. It also plays a role in the validation of the prototype system itself and ensures continuous consideration of the validation throughout the whole research process. In this chapter, the heuristic evaluation is offered to ensure user satisfaction and deep understanding of the task analysis in relation to the user needs. Although the heuristic evaluators are expert users in the usability testing, their comments confirm the validity of the prototype system because they confirm that the system itself is useful and easy to use, which is part of facilitating the student learning process. The second validation point includes usability testing with the user representatives from the students and instructors to confirm user acceptance and willingness to use.

As mentioned before, in this research the heuristic evaluation was conducted during the data collection stage by usability experts as an initial evaluation of system usability while developing its different versions. To validate the whole system, the usability experts were involved again to confirm that the final version is useable and accepted by them. They applied a set of heuristics and design guidelines with the following results (extracted from (Militello, 2000)):

- **Flexibility and efficiency of use.** The usability experts confirmed that the designed system prototype can cater to the novice and experienced users and allow them to tailor frequent actions. They introduced some comments about the menu design, colour styles, and the use of icons. All these comments have been considered in the design stage and fixed before offering the prototype to the users for usability testing.
- **Aesthetic and minimalist design.** The usability experts ensured that the interface and screens do not display any irrelevant information.
- **User control and freedom.** Experts confirmed that the user can carry out the proper action and have an emergency exit in case of choosing a wrong action.
- **Consistency and standards.** The usability experts confirmed that the system follows the platform conventions and does not use different wording from the similar systems. They recognized the template design that matches popular web interface designs.

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- **Match between system and the real world.** The usability experts confirmed that the system uses the same language as the users use in their real world and does not use system-related words and SC terminologies. Educational terminologies and common web-systems front-end terms all are used in a proper way to facilitate the use of the system by users according to the analysed user profiles.
- **Recognition rather than recall.** The usability experts confirmed that the system does not need a high level of memorization by its user to use its functionalities. The user should not need to recall or memorize certain information to be able to use the system. The menu functionality in the prototype included clear illustration of using the system and it was easy to detect, understand, and retrieve as appropriate.
- **Help and documentation.** The usability experts confirmed that the help and documentation are available and easy to search.

The final step with the system users included an additional stage of usability testing with a group of three students and three instructors who confirmed acceptance of the system and satisfaction with its functionalities. All the users expressed successful translation of their desire to learn in a social environment into e-system.

8.2.4 Usability Testing

Rogers (2007) defined usability testing as an approach that emphasizes the usability of the product properties. She emphasized that usability testing focuses on testing the product not the user, that is, it focuses on ensuring that the website is usable by the intended user population. In this research, the design was developed using the Dreamweaver software and HTML coding language to show the initial version of the website without course content on it. The system files and design screens are attached on DVD as part of Appendix 5. This development helped the researcher to conduct initial usability testing.

As mentioned in the previous sections, the suggested design matches the design theme of the Outlook mail client software and many other popular websites. In terms of usability, this theme makes it easier for the user to understand the design quickly and detect the various items. It helps the user also to expect that the content of each menu item will be displayed in the central content area.

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A group of six users (four students and two instructors) joined the usability testing process as user representatives. The following criteria have been chosen for conducting the usability testing:

- **Content.** Testing the usability of a website through its content refers to how the content is related to the objectives of the website? What is the quantity of the content? The quality of the quantity? How frequently is it being updated?
- **Navigation.** How many steps are required from the user to achieve his or her objectives? How many alternative ways the user can go on from there?
- **Ease of Use.** How easy is it to use the course website to finish your task or reach your target?

These criteria were chosen because they are suitable criteria for testing website usability (Marti, 2003). During the heuristic evaluation, obvious usability issues were addressed before the involvement of representative users. Some enhancements were conducted to address the discovered issues. Then three scenarios were defined to test the mentioned criteria:

- **For testing the content, the following scenario was used.** Four student users plus two instructor users were nominated and were asked about certain tasks they should expect to do on the course website. The tasks were written on paper, and then the users themselves were asked to find where the task was located on the prototype design or whether it was present at all. The users were asked for content files, assessments, assignments, grades, YouTube videos, discussions, and Facebook updates. All the users found a way to achieve their requests on the system interface. Minor enhancements were required by them, which are being considered as additions to the newer last version of the prototype. The users confirmed that the existing sections and links expressed enough quantity of information, should be available on the course website, and all are education-related content. On the other hand, the updating rate of the content depends on the course timeline and activities, which will be controlled by the instructor.
- **For testing the navigation, the following scenario was applied.** The nominated students and instructors in the content testing task were asked to find the different content types, collaboration sessions, university portal information, their personal

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profile information, their grades, the class files and the tools for communicating with other members (email, IM, and chat rooms). All of them responded that quick navigation is possible with clear paths to all the requested tasks.

- **For testing ease of use, the following scenario was used.** The instructors were asked to add some content files, create discussion forums, create a new blog and a new wiki, and offer an assessment of learning to the students. On the other hand, the students were asked to find the uploaded files, contribute to the discussions, edit the created wiki, and complete the assessment. Although the system design is not complete as planned because of some limitations on the integration with other online enterprises, the users were able to find the links and locations where they could achieve their tasks easily. They expressed that the design made it simple, easy to browse, and communicating using the right language. The two instructors advised reducing the text of the menu interface and enhancing it with more expressive logos and images. They also commented that the content of OCS website included all the basic sections and functionalities of the e-Learning systems and VLEs plus a set of collaborative learning items. They were interested in the following content sections and defined their functions as described below. Every area is listed followed by the user's definition of its function separated by semi-colon.
 1. **Course content areas:** For uploading content and subject materials. It is called Course Materials and is located in the left-hand side menu of the course interface. In this area the instructor can add materials like PowerPoint shows, Word and PDF documents, photos, and video files. In fact, it can include any type of content files and work as an online repository for the course in which the students can expect to find all the lecture notes and course-related documents.
 2. **Learning modules:** This is another content area in which the users can add/edit interactive lessons and learning units. The instructor might author a piece of an interactive lesson and upload it as a learning module. He/she might also allow the students to develop learning modules and upload them in this area after granting them permission to do that.
 3. **Assignment:** Where the teacher can add assignment work and permit the students to upload their files and answers.

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4. **Tests and surveys:** Where tests, surveys, and question banks can be developed and offered for the students.
5. **Gradebook:** Where student grades and grading reports can reside and be edited.
6. **Course roster:** Where the user list can be edited. New students can be enrolled or dropped out of the course. Students also can be switched to active/inactive, available/not available, and enabled/disabled.
7. **Notifications:** This section includes all the course announcements and notifications. This might include midterm exam announcements, announcements about certain task due dates, and any other course-related announcements.

Additional sections of content that focus on the collaborative content also exist. The users expressed a clear understanding of these sections and their functionalities. This included:

1. **Course blogs:** Where the student can edit blogs.
2. **Course journals:** For editing subject-related journals
3. **Course wikis:** For adding/editing wikis.
4. **Discussion forums:** For adding/editing discussion threads.
5. **Peer-to-peer assessment:** In which self and peer assessments can be developed and assigned to the students.

Some other sections are there to provide useful tools for the course members for communication, collaboration, and time management. The users expressed clear understanding of these sections and their functionalities. These included:

1. **Course webfolder:** For online content folders (like the technology from Dropbox).
2. **Course calendar:** To register calendar events.
3. **Google docs:** To edit documents online.
4. **Online presentation:** To search, add and edit online presentations.
5. **Virtual class work:** To create virtual classroom and distance learning activities.
6. **Bulletin board:** In which the students can post their notes and updates.
7. **Send email:** For email communication from inside the course system. The course system is planned to have an email client that integrates with the existent email system in the institution.

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8. **IM box:** For instant messaging inside the course and between its members.
9. **Address book:** For storing and retrieving members' contact information.
10. **Broadcast smart phones:** Where broadcasts from integrated smart phone applications can be received.
11. **On Facebook:** Where Facebook updates can be received from the course profile and course member profiles on Facebook.
12. **On Twitter:** Where Twitter tweets can be received from the member account on Twitter.
13. **On Flickr:** Where Flickr updates can be received from the course and course member accounts on Flickr.
14. **Course portfolios:** Where the student and instructor portfolios can be created, edited and located.
15. **Online members:** Where a list of the online course members is displayed.

The above definitions expressed clear understanding of the tasks they received, clarity of the system interface, interest in the SC content items, ease of exploring system functions, and translation of their requirements as defined by them in earlier stages of prototyping.

While testing the different system functionalities that were included in the prototype, the users were asked to rate the expected usefulness of having such functionality and to rank it between 1 and 5 on the level of matching user expectations and meeting their needs, defined in the data collection stage. The recorded rates and rankings were taken using the tool for measuring user satisfaction for all functionalities. Table 8-2 summarizes the system functionalities that are included in the prototype with the collected average rates and ranks of each one.

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Table 8-2: rating of the expected usefulness from the system functionalities

Key functionality of the prototype V3.0	Average Rate (%)	Rank (1-to-5)
Course content areas	100	5
Learning modules	95	4
Assignments	100	5
Tests and Surveys	100	5
Gradebook	100	5
Course Roster	100	5
Notifications	100	5
Course Blogs	90	4
Course Journals	90	4
Course Wikis	90	4
Discussion Forums	90	4
Peer-to-Peer assessment	90	4
Course Webfolder	90	4
Course Calendar	80	4
Google Docs	90	4
Online presentation	70	3
Virtual Class work	70	2
Bulletin Board	70	3
Send eMail	100	4
IM Box	80	4
Address Book	90	4
Broadcast Smart phones	70	3
On Facebook	90	4
On Twitter	90	4
On Flickr	90	4
Course Portfolios	80	4
Online members	90	4
Average Totals:	88.7	4.1

The discussion with users and their ratings of the system functionalities led to the following findings from the whole usability testing process:

- It was easy for the user to navigate through the system interface/website.

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- It uses modern technologies that users like to use in their learning activities.
- The system tools made it easy for the instructor to deliver the course in an easy and favourable way. The students also liked the social tools, which made it easier for them to customize their learning style and times.
- The website is easy to use.
- The website's content has enough information for its users.
- There are clear indications of frequent updating of the website content.
- It was important to have a search option on the website. They liked it for searching the content files of the whole system.
- The design provides informative feedback.

Table 8-3 summarizes the comments that were recorded for each usability testing area by the whole user groups, including the experts' evaluation.

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Table 8-3: The testing comments recorded on usability

Usability Area	Comments
Performance	Using the web-based and social technologies had significant usability implications for the system and its website design. From the dimensions of “Look and Feel,” it gives the web design a nice graphical effect. But on the other hand, it might affect the performance of the system. It might make it a little slow. So, it is recommended to optimize the system performance by using many graphical effects when necessary only.
Appropriate functionality	The functionality level is acceptable because of well-chosen system technologies.
Navigation	The navigation through the website is fine except the small comments mentioned above about the “Home” link in the top of the page, which is not clear in terms of where it will take the user. Also using some capital letters in improper locations was criticized.
Visual clarity	Most of the design pages are clear and obvious except the use of opacity in the area under the top border of the content area, which should have some space as a separator for better and clear design and clearance of the pop-up notification boxes. The opacity effect makes it less obvious.
Flexibility and control	The website is fully flexible and gives proper control to the user to recover his/her wrong clicks because most of the system functions are displayed in one screen.
Consistency	The website has the following consistency notes: 1. It has popular metaphor in webpage design (the email client “Outlook” metaphor). It contains all of its content and links in one page window, but the sublinks and pages all are consistent. So, it can be claimed that, the website is internally consistent (between its functionalities) and also externally inconsistent with the other web technologies’ interfaces, like Outlook. 2. The last line (for Help and tutorials) appears to include useful information and help tips for the users.
Informative feedback	The main content area displays pictures, videos, and information with animated flash effects, which give the proper feedback for the user on what happens after clicking the desired links.

8.2.5 Discussion about Findings from Focus Groups

As mentioned in chapter 5, focus groups were conducted in the case study institutions to help the research in filling the gap between professionals and clarify new topics for the included members. Four focus groups have been conducted with average of five instructors in each group. Each focus group was conducted in a computer lab for 45 minutes in the case

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study institutions. The taken notes are documented in sheets that are included in appendix 4 of this thesis. The conducted focus group discussions revealed the following findings:

1. The emerging theme in the text discussion during the first and third focus groups was consensus between users on the potential of SC to benefit users in HE while learning and teaching. These two groups were about the potential benefits of implementing SC in HE with focus on the important user-factors. The involved instructors highlighted the following points:
 - Students can develop relationships with their colleagues through social networks.
 - Students might benefit from SC websites through exchanging files and learning content.
 - Instructors can develop more efficient notification through social hubs and SC websites.
 - SC makes it easier for collaboration between male and female students without get in the traps of social norms.

There was a clear consensus between these groups on the above mentioned benefits. The key similarities between all opinions included the potential of SC to feed collaboration to students, develop useful relationships between them and help instructors to keep students engaged all the time.

The second focus group revealed some concerns about Privacy and security of assessment information. The dominant theme was about protecting user and content information and benefit from SC in reducing the required codification effort that is required in class work. Instructors agreed on the need for implementing SC in HE within security framework and preferred to be implemented on the institutions' Virtual Private Network (VPN) to guarantee secured access and data protection. Under this condition there was clear consensus about the potential of SC to reduce the required effort to update the course work because of its informal coding requirements and because of the user familiarity with its known platforms. All the instructors argued that implementing SC in HE either to not required huge facilitating conditions if implemented with external hosting facilities or it will cost more if it will be implemented inside the academic institution.

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The findings of the focus group discussions are to integrate with this research as appropriately confirming the user acceptance of using SC in HE. All users see it beneficial to use SC while learning to exchange knowledge and gain benefits from collaboration. Figure 8-6 summarizes the findings from the focus group discussions. These findings integrate with the usability testing findings as well to confirm user acceptance of using SC in HE; then the usability testing of OCS confirms that through acceptance of the developed system prototype to ensure successful translation of the user needs.

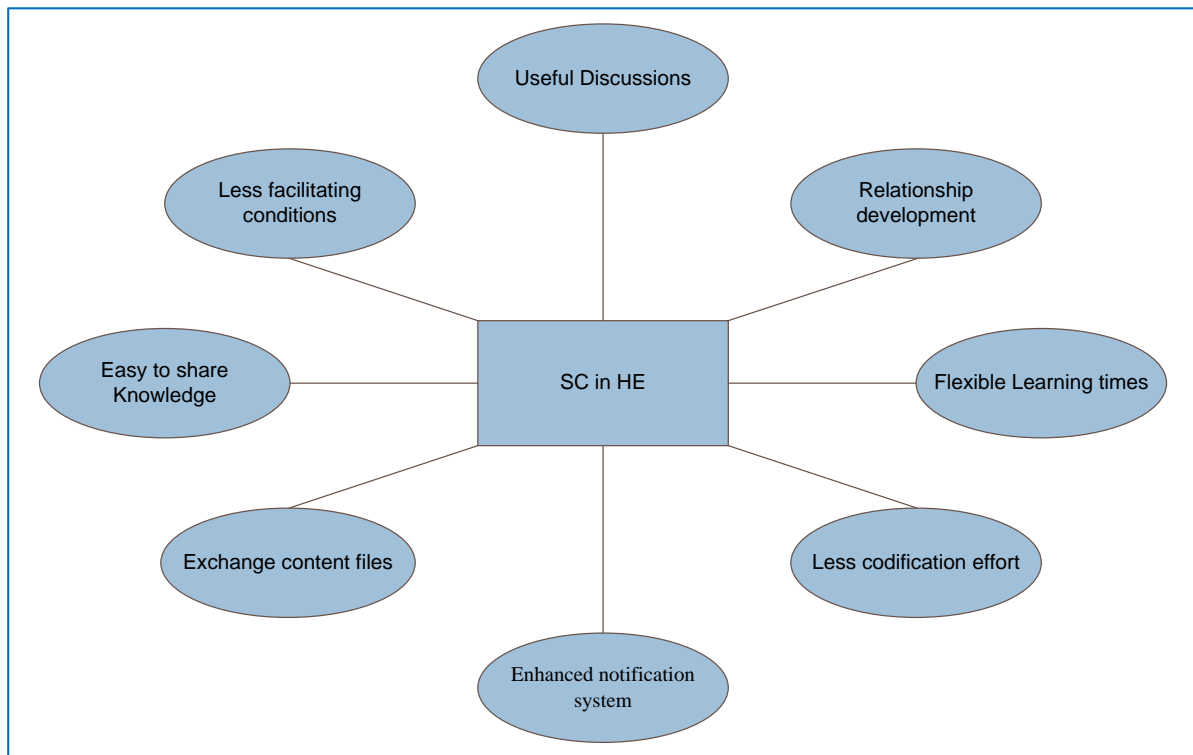


Figure 8-6: Findings from Focus group discussions

8.2.6 Pedagogical Audit

To avoid any possible bias in defining user needs accurately, additional step of validation was conducted with group of three instructors who tested the system from the pedagogical side. The instructor raised concern of measuring the effectiveness of the developed system (OCS) in enhancing the student learning through checking if it helps in developing new pedagogies that help students to learn easier and in better ways. All of them

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agreed on analysing if the system helps in achieving the learning objectives set by Bloom's Taxonomy (Bloom, 1956). Bloom's taxonomy provided foundation for instructors on how to develop learning objectives that can help learners in acquiring knowledge. It helps in developing levels of instructions and describes what learners should do in each level. It has been seen as pedagogical tool because it was used as such to develop multiple levels of instructions. Although originally addressing three learning domains – cognitive, affective, and psychomotor - the revised taxonomy by Anderson & Krathworhl (2001) only addresses the cognitive domain and adds a content dimension. Bloom's Taxonomy is designed to build content knowledge from basic foundations – remembering – to more complex manipulation of content – creating. In this way the learner acquires knowledge that is appropriate for their entry level of existing knowledge (McGee, 2010). Figure 8-7 illustrates levels of knowledge acquisition as defined by Bloom's Taxonomy.



Figure 8-7: Bloom's Taxonomy

The interview with instructors included discussion on how OCS helps students on acquiring knowledge compared to Bloom's taxonomy. Table 8-4 shows the discussion findings.

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Table 8-4: OCS role in developing deeper learning based on Bloom’s Taxonomy.

Bloom’s Taxonomy	OCS role in developing deeper learning
Remembering	OCS works as an online repository which helps students in frequently access course content. This frequent access facilitates remembering and recalling the different course topics and concepts.
Understanding	Social collaboration between course members including chatting boxes, editing blogs, discussion boards and peer-to-peer help, all help students in describing, explaining and understanding course topics and consequently develop level of comprehension about the offered topics. Weigel (2001) argued that collaboration makes students “aware of understanding that develops while learning”
Applying	Especially in social studies and subjects that focus on collaboration, using OCS makes students able to practice socialization and working groups to achieve their study assignments.
Analyzing	Through group interaction/ socialization capabilities and its open to Internet, OCS helps instructors to assign class work and assignment tasks that help student in developing their analytical skills. Collaboration help students in “looking for patterns and underlying principles” (Dabbagh, 2003)
Evaluating	OCS includes enough tools that promote the evaluation skills. Students can benefit from OCS in examining logic and argument cautiously and critically.
Creating	SC help students in customizing their learning times and style. They feel independence and choice, higher order thinking and freedom to express their minds. All that reflects on expressing their creativity. OCS help students to utilize SC and express their abilities to create.

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After the discussion of the system effectiveness based on Bloom's taxonomy, the instructors were asked to define resources that help them in applying certain pedagogical styles when offering lesson(s) to students. They defined set of tools which included planning their lessons, defining lesson objectives, teaching strategies, learning strategies, assessment strategies, defining the scope and sequence links between the different subject units and setting the scheme of work. Then they were asked to evaluate if these tools can be used with the uploaded lessons/units on OCS. They reported that, it was easy, using OCS, to share lesson plans and objectives, re-use these plans in other classes easily, clarify the other learning and assessment strategies and upload the whole related documents to cover their pedagogical concerns. They expressed high interest in using OCS for that purposes because of its modern style and the advantage of archiving their work online. One instructor suggested to have dynamic lesson planning tool which can be used to help in highlighting the cross curricular links. The overall evaluation included usefulness of having the course content available online, easy-to-use interface, facilitating knowledge sharing and collaboration between learners, matching the new generation mind-sets and saving time and effort for users.

8.3 Summary of the Chapter

This chapter included a description of the validation process of the system prototype that was developed as a pragmatic validation measure of the proposed framework in the previous chapter. The validation process went through three stages using the most known techniques for validating information systems in the literature. The first stage included validating the prototype through verifying the system success based on DeLone and McLean's (2003) model and the four measurement dimensions defined by Seddon and Kiew (1996). A group of users from the community of the case study institutions were given access to the system prototype with pre-prepared scenarios of usage to test the developed system functionalities. A newly developed tool was provided to record the user responses about their overall satisfaction of the system, the perceived benefits from it, the information quality, system quality, and system use. The success measures reflected clear user satisfaction of the designed system functionalities.

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A second stage of validation included heuristic validation and usability testing. Although the heuristic evaluation was conducted during the prototype development to ensure system acceptance by experts of usability in its early design stages, the heuristic evaluation was conducted again after the prototype development to ensure deep understanding of the task analysis in relation to user needs and the proper level of ease of use. After that, a subgroup of students and instructors who joined the early stage of usability testing was involved in final usability testing and pedagogic audit to ensure the prototype met their expectations of real usefulness.

Chapter 9

Conclusion and Recommendations

9.1 Introduction

Chapter 1 introduced the thesis with a brief summary of the different topics in this study to justify and introduce the rationale of the research. The research question was stated followed by a description of the research aim and objectives and a summary of the chapters of the thesis. The subsequent three chapters summarized the academic literature about HE in the Gulf States, SC, and the most valid models of technology acceptance. Then the theoretical framework was developed based on collecting the best practices of using SC in HE and the collected data from stakeholders of HE in the Gulf States. Chapters 6 and 7 included analysis of the data and instantiation of the developed framework through developing a new system prototype for an online course system (OCS), similar to a VLE, but with a focus on harnessing the research-proven SC tools for learning. Chapter 8 validated the prototype to pragmatically validate the theoretical framework. Chapter 9 then provides a summary of how these findings achieved the pre-defined research goals and what the implications of this research are. This chapter sums up the research study, generally, and explains how the research contributes to the knowledge body. Recommendations for future work are discussed to show how this framework can be extended to apply in other businesses and in wider domains.

9.2 Achievement of the research aim and objectives

In this research, the overall aim is to develop and propose a framework for effective implementation of the SC tools in the HE institutions in the Gulf States in order to enhance the teaching and learning processes. The proposed framework was discussed and validated through a prototyping process of new system that included functionalities that were developed based on the framework. The validation process included measuring the system success to ensure practical translation of the user requirements. Therefore, the defined research objectives of this research were achieved in full. The following section summarizes the findings for each research objective.

Research objective1: To diagnose the current situation of HE in the Gulf States by exploring its problems. This included a critical review of the known issues and barriers that can affect student learning negatively. Understanding these issues helped in developing

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proper conceptualization of how SC tools could serve in addressing these issues, enhancing the level of student learning and enriching the teaching styles with modern and supportive tools for the instructor.

Research objective 2: To explore SC tools that support collaboration and content sharing, and investigate the role of SC in developing student learning when using its different platforms. This included summary of the most used tools for collaboration and content sharing, incorporating their best practice use in education. Ten of the SC tools were explored followed by highlighting the benefits and opportunities of applying SC in HE. A group of strategies for using SC for pedagogical innovation in education was discussed and introduced as a group of islands based on the iLANDS model that was introduced by Redecker (2009). Another group of strategies for using SC for innovation in the educational organisation were also discussed with focus on the role of SC in facilitating the networking activities between users (N), embracing diversity (D) and increasing the opening up to society (S). A set of cultural dimensions were noted to highlight the potential barriers in implementing SC in HE in the Gulf States.

Research objective 3: To explore the user acceptance of using SC tools and social networking websites. This included exploring the reasons why individuals use SC tools, what information they are sharing, and what tools they are using. Ten of the most used models in analysing user behaviour and acceptance of certain technology were discussed with focus on using SC in HE. These models were summarized in the UTAUT model, which is used as a theoretical base for developing the framework constructs that define the factors of acceptance when using SC in HE. This led to identifying the potential impact of SC on the teaching and learning processes, and also identified the potential benefits of using SC tools for the students and instructors.

Research objective 4: To specify a new conceptual framework for effective implementation of SC in HE in the Gulf States. The framework was developed in Chapter 6 with a discussion of each construct and how it can link to using SC and the potential outcomes of that. This included exploring the significance and usage of the framework in a practical context. The framework was validated in Chapter 8 to ensure proper pragmatism of use.

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Research objective 5: To instantiate the conceptual framework via prototyping for a new online course system. The new system included the different SC tools that can support student learning and enhance teaching practices. The prototype was developed as a practical application of the theoretical framework. Each system functionality in the prototype was developed based on one or more of the framework constructs. The prototype was introduced as pragmatic validation of the framework that was tested by the usability experts and users from the case study institutions to confirm successful implementation of SC tools in the prototype system.

Research objective 6: To refine and validate the framework via testing and piloting the new system prototype with the end users with whom interviews were carried out. Then recommend a validated framework of effective implementation of SC in HE. The prototype was reviewed thoroughly to find out the research-proven methods of validation for the IS with focus on the web-based systems. So, three validation methods were used: measurement of system success, heuristic evaluation, and usability testing.

9.3 Provision of Solutions to the Research Questions

This study aimed to answer the research questions mentioned in Chapter 1, Section 1.7. The following section discusses the answers to the research questions.

- **What are the main problems that face HE in the Gulf States?**

The main problems that face HE in the Gulf States were explored through a literature review described in Chapter 2. Further analyses were conducted in chapters 6 and 7 to integrate the specifics of these problems with the research outcomes in deriving solutions for them. The literature review from the various projects of implementing SC in HE suggested that the emerging SC tools, especially those that help in collaboration and content sharing between students can influence the teaching and learning processes in a way of solving the highlighted problems in Chapter 2.

- **What are the main functionalities of the emerging SC platforms that could be used in HE to increase collaboration and content-sharing between students in an educational context in order to enhance their learning?**

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There is high level of availability of SC tools and technologies. Therefore, the researcher focused on tools that can influence collaboration and content sharing. These tools were approved as useful tools for education by Gunther et al. (2009) and other researchers. Higher Education was defined by Shaw (1997) as the meeting of minds and so it makes sense that the SC tools for collaboration and content sharing have a certain potential to fulfil the needs of students to learn in a customizable and interactive environment. Especially in the Gulf States, where male and female students are segregated on separate campuses, collaboration tools like wikis and blogs can provide an example of a useful platform for students to collaborate in their learning and on class topics. The research focus moved to explore the most known SC tools for collaboration and content sharing with a review of the available best practices and initiatives on using these tools in an educational context.

- **How can one analyse the behaviour of individuals when using SC tools, and what are the factors that affect their acceptance of such technologies?**

This research discussed and analysed set of models of technology acceptance. These models included certain behaviour constructs that affect user acceptance of technology. Each model was introduced, discussed, and commented on regarding how it can affect the behaviour of individuals when using SC in HE. The clear focus was on the UTAUT model as an aggregator of all the other mentioned models with clarification of each construct in it and with discussion of how it could lead to a certain level of technology acceptance. These constructs defined the factors that might affect user acceptance of SC in HE.

- **How effectively can SC tools be implemented in HE in the Gulf States to leverage or enhance teaching and learning processes?**

Chapter 6 provided new framework for implementing SC in HE institutions in the Gulf States. The framework extracted its basic constructs from UTAUT and extended it to include new constructs that were developed based on the analysis of collected data from the case study organisations. The framework was developed based on harnessing the SC tools for increasing collaboration and facilitating content sharing between the different parties in HE. To guarantee practical implementation and pragmatic validation of the proposed framework, it was instantiated with a system

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prototype for a new online course system, or VLE. The prototype was validated in chapter 8 using three validation methods. These methods included the system success model of Delone and Mcleans (2003), the four-item instrument that was developed by Seddon & Kiew (1996), a heuristic evaluation of the system prototype and usability testing by a group of students and instructors of the case student institutions. The validated prototype represents practical application of how can SC be exploited in educational context in order to enhance the teaching and learning processes in HE.

9.4 Contribution to the Knowledge Body

This research contributes to the body of knowledge in two dimensions, theoretical and practical contributions:

- i. **Theoretical contribution to knowledge:** This research develops a new theoretical framework for implementing SC tools in HE in the Gulf States. Moreover, it extends research on technology acceptance by extending the UTAUT theory to include extra constructs related to the use of SC in HE. In the case of developing successful external validity and generalizing the research findings in the whole HE arena, the developed framework will work also as an additional version of UTAUT specified for use of the SC technologies specified. Future research might be conducted on extending the research findings to use SC in other businesses, which will extend the contribution to knowledge to another level. More work is also suggested for testing the proposed framework on any other business (not only HE) to, by the end, generalize the framework for using SC in any business sector to generate additional value.
- ii. **Practical contribution to knowledge:** The research findings of this study include developing a new interface prototype for an online course system with definition of the needed infrastructure and implantation elements. This system can serve as a new virtual learning environment (VLE) for HE in the Gulf States. For generalizing the research findings, this prototype can lead to development of a new e-Learning system (or VLE) that can support education technologically with an easy-to-use and accepted

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model, and pedagogically with a new system that works as a social platform as well as to enhance student engagement and promote learning.

9.5 Limitations of the Research

Some limitations of these research findings might arise from the proposed prototype in case of not providing the proposed system requirements which were defined as infrastructure needs for implementation. Successful implementation of the proposed online course System (OCS) is the practical validation of the research findings. So, the following limitations should be considered before implementing the OCS:

- The cultural differences and its impact on using SC in HE: as highlighted in chapter 3, section 3.7, there considerable effect of the cultural differences between the different societies. This makes it important to consider such differences when applying the developed theoretical framework or implementing the proposed system (OCS) in different culture society.
- The online course system (OCS) infrastructure has been built on the basis of having a multiple server configuration with separate storage servers and a dedicated ICT configuration.
- The system will include private information and critical content (like exams and assignments) whose security should be protected. The available security frameworks for HE institutions must be tested before being implemented to ensure compatibility with the proposed architecture especially when integrating the system with external social networks and public web systems.
- The integration of the system with the popular social networks and web services like YouTube and Facebook is an essential part of the system. So, such integration must be guaranteed and arranged in a proper way with these parties to enable successful implementation of the whole system.
- The whole system can be implemented on virtual servers, but any expected vulnerability of that must be studied before going with virtualization. Virtualization of the system is not studied in this research.

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- “Facilitating Conditions” is one of the main use-factors and is considered to be extremely important when implementing such systems. So, proper infrastructure and technology tools should be provided.

9.6 Research Implications to Individuals

This research will benefit many individuals who are working in the field of HE including the various HE stakeholders plus the researchers who work on related research projects. The results of this study will be of use to the following individuals:

- Virtual learning environment (VLE) designers who can enhance the functionality of VLEs by implementing the proposed framework.
- Education consultants who can benefit from the developed framework and prototype by activating the role of SC technologies at different education levels.
- Researchers of user behaviour when using SC tools in business can benefit from this research by considering the discussed UTAUT constructs and the new developed constructs. This study might also extend the use of UTAUT to analyse the user behaviour when using web technologies. The same constructs might be used for that.
- Collaboration analysts who can develop in-depth understanding of using SC technologies in promoting student collaboration in an educational setting.
- System developers who can utilize the proposed infrastructure for providing multiple services in cost-effective ways using an infrastructure design model like the proposed multi-server integration model.
- Members from the HE community such as professors and college administrators who appreciate solutions that support student learning and contribute to enhancing business outcomes.
- Academics and researchers who can benefit from the new addition to the knowledge body and might support their research work using these research findings.

9.7 Future Work

The findings of this research highlight that further research is required in the following three research areas:

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- Testing the developed framework for generalization in the whole HE domains inside and outside the Gulf States. Similar factors may arise as effective moderators of user behaviour when using SC in the educational context regardless of user location. Some cultural differences from one location to another need to be studied and analysed, before generalizing to other domains. A generic version of the framework might be developed if the different cultural dimensions have been studied and consequent use-factors have been highlighted.
- Testing the developed framework in other business sectors to analyse user behaviour toward accepting SC in the other business organisations like e-banking, e-commerce, e-government, and the other potential organisations. This might lead to a benefit from SC in these businesses by adding generated value. Any other emerging technology, rather than SC, might also be studied and tested using the developed framework in order to determine user acceptance of it and consequently to develop the proper methods of implementation in such a way as to add more value to business either through increasing benefits or decreasing costs. The framework might be extended or modified according to the nature of the emerging technology with consideration of the factors that might emerge as effective measurements of the user acceptance of such technology.
- Develop a new model for VLE systems not only to include content management and assessments tools, but also to consider the emerging SC technologies as effective tools for flexible learning. The collaboration activities should always be available inside the learning environment with proper assessment that encourages students to learn at their convenience with the flexibility to customize learning and assessment styles. For example, the student might like to keep interacting with colleagues through discussion forums, blogs, and other tools; these tools should become basic components in the VLE with proper methods used to assess the student input either by the student's professor or by his/her colleagues in a peer assessment forum.

9.8 Summary and Recommendations

This research study started by diagnosing the current situation of HE in the Gulf States in order to highlight the clear problems that face HE institutions there. Then it included a summary of the various SC tools that can support HE with its collaboration tools and content delivery platforms. These two steps helped the researcher to define a clear gap in this area of literature and accordingly define a research methodology on how SC can be implemented in HE to effectively leverage the teaching and learning processes. To confirm user acceptance of SC and consequently ensure feasibility of that implementation, the researcher extended the literature review stage to explore the reasons why individuals use SC tools, what information they are sharing, what tools they are using, and what is motivating psychological factors to achieve that. The research then included development of a research methodology that defines the data collection and data analysis methods with clarification of the philosophical stance of this study and the applied approach and processes. The next step included data analysis, which yielded a new theoretical framework of the use-factors that affect user acceptance of SC to be used in an educational context, with the links between these factors and the UTAUT theory constructs to ensure research-proven outcomes. The framework was, then, instantiated in a new system prototype to demonstrate a perfect implementation model. Both the framework and prototype were validated through testing the system success with a group of HE stakeholders in the Gulf States. The research findings of this study point to the following recommendations:

- There is ample room for the research methodology of this research study to be taken up and applied on larger organisations to generalize the research findings to the wider HE domain and reflect on its outcomes.
- There is ample room for studying user behaviour and technology acceptance using the UTAUT model with possible extensions of the model to predict successful implementations of technology in business.
- There is ample room for researchers to explore and document the HE issues and its impacts on student learning and HE outcomes.

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- There is vast potential to implement SC technologies in business in order to harness its positive effects of collaboration in developing user-centred systems to achieve the potential value of business.

Based on its contribution to the knowledge body, the research outcomes of this study could be used for appropriate educational purposes.

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Appendices

Appendix 1: Case Study Profile

The following table summarizes the profile of the two case study institutions, United Arab Emirates University (UAEU) which is located in United Arab Emirates and Aspire Academy for Sports Excellence which is located in Qatar.

Table A1-1: Case study organisation's profile

	United Arab Emirates University (UAEU)	Aspire Academy for Sports Excellence
About	<p>United Arab Emirates University (UAEU) The UAEU was established in 1976 according to the vision of Sheikh Zayed Bin Sultan Al Nahayan (May His Soul Rest In Peace).</p>	<p>Aspire Academy for Sports Excellence is located in Doha, Qatar. Since established in 2004, Aspire Academy for Sports Excellence's main objective to strengthen the sporting while educating culture in Qatar, as well as internationally, as seen with their "<i>Aspire Football Dreams</i>" project.</p>
Facts & Figures	<p>As average In most years, Enrolled male students represented 25%, while female students represented 75% of the entire student population. The distribution of the enrolled students across the various faculties has been managed in two separate male and female campuses spread all over Al Ain city in UAE</p>	<p>Aspire accepts only male Student-Athletes</p> <p>The total number of currently enrolled full-time student-athletes is 289. A total of 49 athletes have graduated with Honours since 2008</p> <p>The number of Olympic sports that Aspire Academy provides developmental support to Qatar sports federation athletes is eight, including Fencing, Golf, Gymnastics, Shooting, Swimming, Tennis and Trampoline</p>
Contact Information	<p>United Arab Emirates University P.O.Box 15551, Al-Ain United Arab Emirates http://www.uaeu.ac.ae</p>	<p>Aspire Academy for Sports Excellence Doha, Qatar – Po box 22287 www.aspire.qa</p>

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Appendix 2: List of associated publications

The following list summarizes the published papers and the submitted for publication so far by the researcher in the area of this research.

- Hussein, K., Arayici, Y., & Shafiz, M. Y. (2012). Adopting social computing in education. *Exploring ICT in Education Conference 2012* (p. 20). Doha: College of North Atlantic.
- Hussein, K., Arayici, Y., & Shafiz, M. Y. (2012). Face-Lift: Adopting Social Computing in Higher Education – Best Practices. *The 2nd Annual Conference on Education Reform* (p. 24). Doha: Qatar University.
- Hussein, K., Arayici, Y., & Shafiz, M. Y. (2012). The new emerging topic in the HE in Gulf: Social Computing .. Why and How ? *2012 Qatar TESOL Conference* (p. 12). Doha: TESOL Qatar.
- Hussein, K., Arayici, Y., & Shafiz, M. Y. (2013). Adopting Social Computing in the Higher Education – innovative strategies. *Journal of Advanced Research*, 28.
- Hussein, K., Arayici, Y., & Shafiz, M. Y. (2013). Adopting Social Computing in the Higher Education - Tools, Benefits and Opportunities. *Journal of the social and criminal research institute*, 22.
- Hussein, K., Arayici, Y., & Shafiz, M. Y. (2013). Adopting Social Computing in the Higher Education in the Gulf States. *iPGR Confrence Salford* (p. 22). Manchester, UK: University of Salford.
- Hussein, K., Arayici, Y., & Shafiz, M. Y. (2013). Adopting Social Computing in the Higher Education in the Gulf States, New system prototype. *Journal of Higher Education* , 23.
- Hussein, K., Arayici, Y., & Shafiz, M. Y. (2013). Adopting Social Computing in the Higher Education in the Gulf States: Conceptual framework. *journal of Egyptian Informatics* , 26.

Appendix 3: The deployed survey questionnaires

Survey1

Using Social Computing in Higher Education

Digital Skills Audit (on Using Social Computing websites and tools) - Questionnaire

Dear Faculty member / Student,

I would like to invite you to join my survey on the user experience and impact of Social Computing websites and tools. How do you benefit from joining Social Computing websites? And, how did the participation impact your life? Please fill out 10 questions and help us to reveal the user perspective and impact of Social Computing technologies. It only takes 10 minutes!

Your participation in this study is completely voluntary. There are no foreseeable risks associated with this project. However, if you feel uncomfortable answering any questions, you can withdraw from the survey at any point. It is very important for us to learn your opinions.

Your survey responses will be strictly confidential and data from this research will be reported only in the aggregate. Your information will be coded and will remain confidential. If you have questions at any time about the survey or the procedures, you may contact Khaled Hussein at +97466773419 or by email at the email address k.abusaif@hotmail.com

Thank you very much for your time and support. Please start with the survey now by clicking on the Continue button below.

Thank you very much,

عزيزي الأستاذ/الطالب

أتشرف بدعوتكم للإجابة عن الاستقصاء التالي حول استخدام مواقع التواصل الاجتماعي (مثل تويتر – فيسبوك – يوتيوب – فليكر – لينكدإن – ... الخ) وتأثيرها على التواصل اليومي والتعارف وتطوير التعلم لدى المستخدم. كيف تستفيد من هذه المواقع؟ وما تأثير ذلك على حياتك اليومية؟ .. ما عليك سوى فقط الإجابة عن العشرة أسئلة الآتية للمساعدة في تكوين منظور حول استخدام هذه النظم ومن ثم استغلالها في تطوير التعليم . لن يأخذ من ذلك أكثر من عشر دقائق. وسيتم التعامل مع بياناتك واجاباتك بخصوصية تامة.

شكرا جزيلاً على مشاركتك.

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1. Please fill out your profile من فضلك أدخل المعلومات الآتية

Name الإسم

Click here to enter text.

Gender النوع :

Click here to enter text.

Nationality الجنسية:

Click here to enter text.

years of Internet experience سنوات استخدام الانترنت

Click here to enter text.

Email Address البريد الالكتروني :

Click here to enter text.

2. How much time do you spend on the Social Networking websites like Facebook, Twitter, Linkedin, Youtube, Secondlife, Blgger, .. etc.? you can fill in one space only.

كم من الوقت / الزيارات تقضيه في تصفح مواقع نظم التواصل الاجتماعي؟ يمكنك ملء خانة واحدة فقط

hours a week/ minutes a week ساعات بالاسبوع

Click here to enter text.

visits a week زيارة بالاسبوع

Click here to enter text.

visits a month زيارة بالشهر

Click here to enter text.

visits a year زيارة بالسنة

Click here to enter text.

3. What are your top 5 online activities?

ما أكثر خمس أنشطة تقوم بها على تلك المواقع؟

Updating my profile تحديث الملف الخاص بي

Browsing profiles استعراض ملفات الآخرين

Reading comments on profiles قراءة تعليقات على ملفات الآخرين

Reading statistical information الاطلاع على بيانات احصائية

Searching for new contacts البحث عن جهات اتصال جديدة

Asking for advice طلب النصيحة

Commenting on profiles التعليق على ملفات الأصدقاء

Rating and/or ranking of treatments/services تقييم الخدمات

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- Chatting with other members الدردشة
- Debating on the forum مناقشات
- Donating money بالتبرع بالمال
- Other أنشطة أخرى

4. What are the top 3 topics are engaged with on the website?

ما أكثر ثلاث مواضيع تجذبك على مواقع التواصل الاجتماعي؟

- Developing online user profiles تطوير ملف المستخدم
- Access online content (like Audio, video or text files) الدخول على محتويات كملفات الصوت والفيديو
- Send Notifications or instant messaging ارسال رسائل أو اعلانات
- Building online blogs, wikis or discussion forums انشاء منتديات ولوحات مناقشات
- Bookmarking / Tagging services خدمات تعريف المواقع المفضلة
- Other موضوعات أخرى

5. What are the top 5 benefits you experience from accessing the social computing websites?

ما أكثر خمس فوائد تجنيها من الدخول على هذه المواقع؟

- Valuable tips ارشادات قيمة
- Content exchange تبادل ملفات
- Learning experience زيادة التعلم
- Greater understanding of some topics through member posts or exchanging information فهم أدق لبعض الموضوعات من خلال مدخلات وأراء بعض الأعضاء والأصدقاء
- Meeting people with similar experiences الالتقاء بأشخاص بخبرات مشابهة
- Helps me develop my knowledge about people/things زيادة معرفتي بالناس والأشياء

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- Keeps me informed with updates about people or interesting matters
- تجعلني دائما على اطلاع بأخبار بعض الناس والموضوعات المهمة
- Support and encouragement دعم أكثر وتشجيع
- Personal advice from community members نصائح شخصية من أفراد معي في المجتمع أو
- المنتدى
- Making new friends إقامة صداقات جديدة
- Having fun قضاء وقت ممتع
- Other فوائد أخرى

6. What do you think are the five drawbacks of accessing the social computing websites ?

ما هي برأيك أهم خمس سلبيات من زيارة مواقع التواصل الاجتماعي ؟

- Reliability of information is limited موثوقية المعلومات محدودة
- Domination of small number of peers / opinions هيمنة عدد قليل من الزملاء / آراء
- Impact of joining the community on learning is limited تأثيرها على التعلم محدود
- Peer pressure ضغط الأنداد
- Risk of privacy; open access to my personal information
- خطر الخصوصية؛ الوصول المفتوح إلى المعلومات الشخصية
- Spam/inappropriate comments الرسائل والتعليقات غير المرغوب فيها
- Unwanted contacts العلاقات الغير مرغوب فيها
- Intimidation/harassment الترهيب / التحرش
- Other عيوب أخرى

7. What do you consider to be the most important 5 impacts of the social computing websites ? الاجتماعي

ما أهم خمس آثار ناتجة من استخدام مواقع التواصل

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- I changed my learning styles لقد غيرت أنماط التعلم لدي
- I added to my learning resources أضافت الى موارد التعلم لدي
- I enhanced my communication and networking skills عززت الاتصالات ومهارات التواصل لدي
- I gained new collaboration platform(s) اكتسبت منصة جديدة للتواصل مع الآخرين
- Improvement of my life communication skills تحسين مهاراتي الاتصالات في حياتي
- I have made new friends اكتسبت أصدقاء جدد
- My opinion on my learning resources has changed لقد تغير رأيي في موارد تعلمي
- My outlook learning styles has changed لقد تغيرت أساليب التعلم لدي
- I have less contact with some of my offline friends لدي أقل اتصال مع بعض أصدقائي حاليا
- Other آثار أخرى

8. What are the top 5 values you associate with the social computing websites?

ما أهم خمس قيم تقترن بالدخول على مواقع التواصل الاجتماعي؟

- Openness الانفتاح
- Professionalism الاحترافية
- Community sense الاحساس بمعنى المجتمع
- Informality عدم التقيد بالرسميات
- Equality المساواة
- Expertise الخبرة
- Law compliance الامتثال للقانون
- Self-support الدعم الذاتي
- Diversity التنوع

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- | | |
|----------------------------|--------------------------|
| Confidentiality السرية | <input type="checkbox"/> |
| Dedication الاخلاص | <input type="checkbox"/> |
| Solidarity التضامن | <input type="checkbox"/> |
| Respect الاحترام | <input type="checkbox"/> |
| Acceptation القبول | <input type="checkbox"/> |
| Empathy العاطفية | <input type="checkbox"/> |
| Security الأمان | <input type="checkbox"/> |
| Recognition التقدير | <input type="checkbox"/> |
| Conviction الاقتناع | <input type="checkbox"/> |
| Engagement الارتباط | <input type="checkbox"/> |
| Reciprocity التبادل | <input type="checkbox"/> |
| Righteousness الإنصاف | <input type="checkbox"/> |
| Sharing المشاركة | <input type="checkbox"/> |
| Formality التزام الرسمىات | <input type="checkbox"/> |
| Empowerment التمكين | <input type="checkbox"/> |
| Integrity الأمانة والتكامل | <input type="checkbox"/> |
| Tolerance التسامح | <input type="checkbox"/> |
| Cohesiveness التماسك | <input type="checkbox"/> |
| Other قيم أخرى | <input type="checkbox"/> |

9. Which 3 functionality of the Social Computing websites do you use most?

ماهي الثلاث وظائف الأكثر استخداما على مواقع التواصل اجتماعي؟

- | | |
|-----------------|--------------------------|
| Blog المدونات | <input type="checkbox"/> |
| Forum المنتديات | <input type="checkbox"/> |

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- | | |
|-------------------------------------------------------|--------------------------|
| Wiki الويكي | <input type="checkbox"/> |
| Chat box أماكن الدردشة | <input type="checkbox"/> |
| Map الخرائط | <input type="checkbox"/> |
| Tagging tool أداة اضافة العلامات المفضلة | <input type="checkbox"/> |
| Rating tool أدوات التقييم | <input type="checkbox"/> |
| Voting tool أدوات التصويت | <input type="checkbox"/> |
| Tool to upload photos/videos أدوات رفع الصور والفيديو | <input type="checkbox"/> |
| Other وظائف أخرى | <input type="checkbox"/> |

10. What would you like to see improved in a next version of the Social Computing websites? and Which further comments would you like to make?

ماذا تريد أن ترى تحسنا في النسخة المقبلة من مواقع التواصل الاجتماعي؟ و اذا كان لديك أي تعليقات أخرى تريد أن تضيفها؟

Click here to enter text.

Survey2

The factors that might affect the use of Social Computing in Higher Education in the Gulf States

استقصاء حول العوامل السيكولوجية التي يمكنها التأثير على استخدام نظم التواصل الاجتماعي في التعليم العالي في دول الخليج العربي

Dear staff, faculty member / Student,

You are invited to participate in this survey on the factors that affect the user acceptance when using Social Computing technologies including Social Networks (like Facebook and LinkedIn), Microblogging (like Twitter), Media services (like Youtube, Flickr), ... etc in Higher Education. In this survey, people will be asked to complete a survey that asks questions about these factors. It will take approximately 15 minutes to complete the questionnaire.

Your participation in this study is completely voluntary. There are no foreseeable risks associated with this project. However, if you feel uncomfortable answering any questions, you can withdraw from the survey at any point. It is very important for us to learn your opinions.

Your survey responses will be strictly confidential and data from this research will be reported only in the aggregate. Your information will be coded and will remain confidential. If you have questions at any time about the survey or the procedures, you may contact Khaled Hussein at +97466773419 or by email at the email address k.abusaif@hotmail.com

Thank you very much for your time and support. Please start with the survey now by clicking on the **Continue** button below.

عزيزي الأستاذ/الطالب

أشرف بدعوتكم للإجابة عن الاستقصاء التالي حول العوامل المشجعة على استخدام مواقع التواصل الاجتماعي (مثل تويتر - فيسبوك - يوتيوب - فليكر - لينكدان ... - الخ) وتأثيرها على التواصل اليومي والتعارف وتطوير التعلم لدى المستخدم.. ما عليك سوى فقط الإجابة عن العشرة أسئلة الآتية للمساعدة في تكوين منظور حول استخدام هذه النظم ومن ثم استغلالها في تطوير التعليم . لن يأخذ من ذلك أكثر من خمسة عشرة دقيقة. وسيتم التعامل مع بياناتك واجاباتك بخصوصية تامة. شكرا جزيلاً على مشاركتك

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1. Please fill out your profile من فضلك أدخل المعلومات الآتية

Name الإسم

Click here to enter text.

Gender النوع :

Click here to enter text.

Nationality الجنسية:

Click here to enter text.

Profession الوظيفة:

Click here to enter text.

Email Address البريد الالكتروني :

Click here to enter text.

What is your gender?

Male

Female

REPUTATION: السمعة الطيبة بين زملاءك

	Strongly Agree موافق بشدة	Agree موافق	Neutral عادي	Disagree غير موافق	strongly Disagree غير موافق نهائياً
3.1 there is a clear link between using Social Computing in Higher Education and developing reputation for the user. يساعد استخدام نظم التواصل الاجتماعي في التعليم العالي في بناء سمعة طيبة بين الطلاب	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.2. The use of Social Computing tools will INCREASE if it leads to an increase in reputation (image). سيتجه الطلاب الى استخدام نظم المعلومات الاجتماعية في التعلم إذا ما وجدوها تزيدهم من السمعة الطيبة بين زملاءهم	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.3. An INCREASE in reputation leads to an increase in the learning motivation. تحسن السمعة بين الأقران يزيد من الدافعية نحو التعلم	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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العلاقات مع الآخرين: EXPECTED RELATIONSHIPS					
	Strongly Agree موافق بشدة	Agree موافق	Neutral عادي	Disagree غير موافق	strongly Disagree غير موافق نهائيا
4.1 there is a link between using Social Computing in Higher Education and developing relationships among students. يساعد استخدام نظم التواصل الاجتماعي في التعليم العالي في بناء علاقات مفيدة بين الطلاب	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.2. The use of Social Computing tools will INCREASE if it leads to an increase in relationships among students. سيتجه الطلاب نحو استخدام نظم التواصل الاجتماعي في التعلم اذا ما وجدوا من ذلك تحسن وزيادة في العلاقات مع الاخرين	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.3. An INCREASE in relationships among peers forms the reason behind an increase in their cooperation in learning. تحسن وزيادة علاقات الطالب بزملائه هو أحد أسباب زيادة التعاون والتفاعل في التعلم	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

فوائد التواصل: COMMUNICATION BENEFITS					
	Strongly Agree موافق بشدة	Agree موافق	Neutral عادي	Disagree غير موافق	strongly Disagree غير موافق نهائيا
5.1 there is a link between using Social Computing in Higher Education and gaining some communication benefits for	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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students. يساعد استخدام نظم التواصل الاجتماعي في التعليم العالي في تحقيق فوائد من وراء التواصل للطلاب					
5.2. The use of Social Computing tools will INCREASE if it generates communication benefits. سيتجه الطلاب نحو استخدام نظم التواصل الاجتماعي في التعلم اذا ما وجدوا من ذلك فوائد لهم	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.3. An INCREASE in communication benefits among peers forms the reason behind an increase in their cooperation in learning. حصول الطالب على فوائد من التواصل مع زملائه هو أحد أسباب زيادة التعاون والتفاعل في التعلم	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

SIGNAL-TO-NOISE RATIO: the term 'SIGNAL' refers to the useful threads/messages you receive when using Social Computing, however the term 'NOISE' refers to what individuals in organisations are coping with in terms of a lot of noise of emails, phone, IM, etc. النسبة بين الرسائل النافعة والرسائل الغير مرغوب فيها. فمثلا قد تفتح بريدك فتجد 5 رسائل مفيدة وهناك مئة رسالة أخرى عبارة عن اعلانات وغيرها من الرسائل غير المفيدة

	Strongly Agree موافق بشدة	Agree موافق	Neutral عادي	Disagree غير موافق	strongly Disagree غير موافق نهائيا
6.1 there is a link between using Social Computing in Higher Education and increasing the signal-to-noise signal (>1). يساعد استخدام نظم التواصل الاجتماعي في التعليم العالي في رفع نسبة الاستفادة - الى- الضوضاء	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.2. The use of Social Computing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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tools will DECREASE the quality of information exchanged among its participants. استخدام خدمات التواصل الاجتماعي في التعليم يقلل من جودة المادة التعليمية					
6.3. The use of Social Computing tools is an EFFICIENT method to keep students informed about what they are learning. استخدام خدمات التواصل الاجتماعي في التعليم يساعد الطلاب على التواصل ومعرفة التحديثات الخاصة بالمادة أولاً بأول	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

CODIFICATION EFFORT: The rationale behind Social Computing is frequent updations. This would require efforts from the students/instructors who have to share this time with their daily tasks. المقصود في هذا السؤال هو المجهود المبذول في تحرير مهامهم التعليمية اليومية. مع مراعاة كون أدوات التواصل الاجتماعي لا تحتاج لمجهود كبير من هذا النوع لعدم تقيدها بالرسميات من ناحية الكتابة والتنسيق

	Strongly Agree موافق بشدة	Agree موافق	Neutral عادي	Disagree غير موافق	strongly Disagree غير موافق نهائياً
7.1 there is a link between using Social Computing in Higher Education and reducing the required codification effort for increasing the student learning. يساعد استخدام نظم التواصل الاجتماعي في التعليم العالي في تقليل الجهد المطلوب لإدراك نسب تعلم أعلى	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.2. The use of Social Computing tools will DECREASE the time and effort required from the students to	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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study and learn the course topics. استخدام خدمات التواصل الاجتماعي في التعليم يقلل المجهود والوقت المطلوب من الطالب لتعلم عناصر المادة					
7.3. The time and effort required to continuously update information has to be shared with the other learning activities. الوقت و المجهود المطلوبان للتحديث والاطلاع على المادة العلمية يجب أن يكون من وقت الدراسة بشكل عام	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

PRIVACY CONCERNS: الخصوصية

	Strongly Agree موافق بشدة	Agree موافق	Neutral عادي	Disagree غير موافق	strongly Disagree غير موافق نهائياً
8.1. There must be high levels of security in place for creating a positive mindset towards using Social Computing tools in education. يجب توفير مستويات من تأمين المعلومات من أجل تحفيز الطلاب على استخدام خدمات التواصل الاجتماعي في التعليم	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8.2. The cost of security is more than the benefits one receives from deploying Social Computing tools (Eliminated after the factor analysis by SPSS). تكلفة هذا التأمين يزيد عن الفائدة المرجوة من استخدام خدمات التواصل الاجتماعي في التعليم	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8.3. Security policies can never be strong enough to combat misuse of	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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Social Computing tools. لا يمكن توفير مستوى كاف من سياسات الخصوصية بما يناسب مكافحة سوء استخدام خدمات التواصل الاجتماعي في التعليم					
------------------------------------------------------------------------------------------------------------------------------------	--	--	--	--	--

COLLABORATIVE NORMS: Social Influence is about the extent to which an individual believes that others feel that it is important for the individual to use the system. Social Influence and Social Norms strongly influence knowledge sharing. يعتني هذا الجزء بما يذاع بين الناس عن استخدام خدمات التواصل الاجتماعي وما حولها من تأثيرات على الفرد والمجتمع

	Strongly Agree موافق بشدة	Agree موافق	Neutral عادي	Disagree غير موافق	strongly Disagree غير موافق نهائيا
9.1. The highly networked structure of Social Computing Tools creates a new desire to learn from peers. طريقة برمجة وتنظيم مواقع التواصل الاجتماعي يدفع الى مزيد من الرغبة في الاستفادة منها في التعلم بين المجموعات	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9.2. The structure of Social Computing Tools encourages students to collaborate for Research وأيضاً يزيد من دافعيتهم نحو البحث العلمي التعاوني	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9.3. The use of Social Computing tools to learn, it must be enabled and supported by an easy-to-use, intelligent Knowledge Base. استخدام خدمات التواصل الاجتماعي في التعليم يجب أن يكون مدعوماً بواجهات استخدام سهلة الفهم وبطرق ذكية لتنظيم للبيانات	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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FACILITATING CONDITIONS: it realizes the impact on the usability aspects of the application. strong Facilitating Conditions are required for the right Behaviour al intention to use an application. وهذا الجزء يهتم بالقدر الكافي من الوضوح وسهولة الاستخدام وتسهيل طرق اكتشاف الأدوات من أجل زيادة الدافعية نحو استخدام خدمات التواصل الاجتماعي في التعليم					
	Strongly Agree موافق بشدة	Agree موافق	Neutral عادي	Disagree غير موافق	strongly Disagree غير موافق نهائيا
10.1 The use of Social Computing tools will flourish irrespective of the IT infrastructure in the university. استخدام خدمات التواصل الاجتماعي في التعليم سيساعد على تحسين البنية التحتية لتكنولوجيا المعلومات في المؤسسة	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10.2 Related questions Budget for implementation of Social Computing tools should be flexible as it is a new technology but, it is very effective. استخدام خدمات التواصل الاجتماعي في التعليم يجب أن يكون مدعوما بتوفير الميزانيات المطلوبة لتوفير التكنولوجيا والأدوات اللازمة	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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Appendix 4: Data Collection tools: Focus Groups

Focus group1: Aspire Academy, instructor group 1

Focus Group:	The potential benefits from implementing SC in HE
Aim:	To highlight all the possible benefits from using SC in HE with focus on Aspire Academy as example.
Objective statement:	The researcher wants to assess the gained reputation, expected relationships, communication benefits and collaborative norms among students, instructors, staff and observers in Aspire Academy in order to inform [indicate what this information will be used for] each other with educational information and updates.
Pitfalls or advice:	<ul style="list-style-type: none">-Do not generalize findings to the rest of population (without appropriate inquiry/analysis)-Do not target seeking individualized responses (if so gather group consensus)-Aim for 5-8 participants per focus group-Conduct at least 1 focus groups for each variable of interest (e. g. Reputation, Privacy, Codification effort)-Conduct focus groups in different user types (Students, Instructors, staff, Observers)-Avoid mixing one sub-group with another that might inhibit expression of opinion-If the focus groups were audio taped, get a transcription of the discussion-Avoid compiling groups of people who associate very closely one another, if possible

Activity Checklist

1. Identify the factors that affect the student learning when using SC.

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Plan the focus group	Focus group team activities and information	Status (e. g. Completed/not completed/requires attention)
Location	Aspire Academy - Qatar	
Participants:	6 Instructors teaching English Literature, Sports Culture, Psychology, Islamic Studies, Arabic and Physics	
Moderators	Khaled Hussein + Stefan Widzel (Volunteer instructor)	completed
List of questions/statements that need to discuss in the focus group	<ol style="list-style-type: none"> 1.How can SC support you in teaching your subject? 2.Discuss the possibility of delivering your course content through online community portals and shared websites? 3.SC enhances collaboration between parties. Up to which extent this can happen in your class and how do you see that beneficial for students? For teachers? 4.How do you think SC can support the student's reputation between his peer colleagues? Will this affect the student's performance? How? 5.Suggest some communication benefits of using SC in education? 6.How SC can consolidate the relationships between learners? Learners and teachers? Organisation and stakeholders? 	completed

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2. Conduct the focus group.

Focus group team activities	Status (e. g. Completed/not completed/requires attention)
<p>Conduct the focus group(s) After each focus group, the researcher debriefed and summarized the focus group responses that include non-verbal observations.</p> <ul style="list-style-type: none"> • As the focus group, discuss and generate arguments as the researcher documents what participants said for each question and includes this in the summary report • Also note any other observations of interest or areas for improvement 	<p>Completed</p> <p>Instructors raised the following issues and discussed it in 1 hour.</p> <p>Students can develop relationships with their colleagues through social networks.</p> <p>Students might benefit from SC websites through exchanging files and learning content.</p> <p>Instructors can develop more efficient notification through social hubs and SC websites.</p> <p>SC makes it easier for collaboration between male and female students without get in the traps of social norms.</p>

3. Analyse, interpret and share findings.

Focus group team activities	Status (e. g. Completed/not completed/requires attention)
<p>A. Analyse and interpret findings based on the focus group objectives, how to organize the analysis and reporting of the focus group data, i.e. findings by specific objective or by issue or by question</p> <ul style="list-style-type: none"> • Look for emerging themes in the text discussion • Look for group consensus or dissenting views • Look for degree of conviction in responses • Capture any key similarities in groups or notable differences. 	<p>Completed</p>
<p>B. Develop arguments based on your findings: The findings are to integrate with this research conducted as appropriately enhancing the body of the knowledge</p> <ul style="list-style-type: none"> • Describe findings by conducting and analyzing the transcript and note-taker's notes 	<p>Completed</p>

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Focus group2: Aspire Academy, instructors and staff (group 2)

Focus Group:	The potential benefits from implementing SC in HE
Aim:	To highlight all the possible benefits from using SC in HE with focus on Aspire Academy as example.
Objective statement:	The researcher wants to assess the Privacy Concerns, Codification Effort, Privacy Concerns and Facilitating Conditions among students, instructors, staff and observers in Aspire Academy in order to inform [indicate what this information will be used for] each other with educational information and updates.
Pitfalls or advice:	<ul style="list-style-type: none"> -Do not generalize findings to the rest of population (without appropriate inquiry/ analysis) -Do not target seeking individualized responses (if so gather group consensus) -Aim for 5-8 participants per focus group -Conduct at least 1 focus groups for each variable of interest (e. g. Reputation, Privacy, Codification effort) -Conduct focus groups in different user types (Students, Instructors, staff, Observers) -Avoid mixing one sub-group with another that might inhibit expression of opinion -If the focus groups were audio taped, get a transcription of the discussion -Avoid compiling groups of people who associate very closely one another, if possible

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Activity Checklist

1. Identify the elicitation activities.

Plan the focus group	Focus group team activities and information	Status (e. g. Completed/not completed/requires attention)
Location	Aspire Academy - Qatar	
Participants:	5 Instructors teaching Geography, Math, Biology, Spanish and Life skills	
Moderators	Khaled Hussein + Issa Muslmani (Volunteer instructor)	completed
List of questions/statements that need to discuss in the focus group	<p>7. How can SC support in protecting the different content and user information?</p> <p>8. Discuss the possibility of delivering your course content through online community portals and shared websites in secured ways?</p> <p>9. SC enhances collaboration between parties. Up to which extent this can harm individual's privacy?</p> <p>10. How do you think SC can help students in reducing the required codification effort when doing their class work or updating their status?</p> <p>11. Mention the possible concerns about privacy and security from users when they are using SC in HE? Suggest logical solutions for that?</p> <p>12. How much facilities are required to implement SC in HE? What are your concerns of facilitating conditions? Will SC increase or decrease the business value if implemented on proper facilitating conditions</p>	<p>Completed</p> <p>The focus group revealed some concerns about Privacy and security of assessment information. Instructors agreed on the need for implementing SC in HE within security framework and preferred to be implemented on the institutions' Virtual Private Network (VPN) to guarantee secured access and data protection. Under this condition there was clear consensus about the potential of SC to reduce the required effort to update the course work because of its informal coding requirements and because of the user familiarity with its known platforms. Instructors agreed that implementing SC in HE either to not required huge facilitating conditions.</p>

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2. Conduct the focus group.

Focus group team activities	Status (e. g. Completed/not completed/requires attention)
<p>Conduct the focus group(s) After each focus group, the researcher debriefed and summarized the focus group responses that include non-verbal observations.</p> <ul style="list-style-type: none"> • As the focus group, discuss and generate arguments as the researcher documents what participants said for each question and includes this in the summary report • Also note any other observations of interest or areas for improvement 	Completed

3. Analyse, interpret and share findings.

Focus group team activities	Status (e. g. Completed/not completed/requires attention)
<p>A. Analyse and interpret findings based on the focus group objectives, how to organize the analysis and reporting of the focus group data, i.e. findings by specific objective or by issue or by question</p> <ul style="list-style-type: none"> • Look for emerging themes in the text discussion • Look for group consensus or dissenting views • Look for degree of conviction in responses • Capture any key similarities in groups or notable differences. 	Completed
<p>B. Develop arguments based on your findings: The findings are to integrate with this research conducted as appropriately enhancing the body of the knowledge</p> <ul style="list-style-type: none"> • Describe findings by conducting an analyzing the transcript and note-taker's notes 	Completed

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Focus group3: United Arab Emirates University (UAEU), instructors (group 3)

Focus Group:	The potential benefits from implementing SC in HE
Aim:	To highlight all the factors that affect using SC in HE with focus on United Arab Emirates University (UAEU).
Objective statement:	The researcher wants to assess the gained reputation, expected relationships, communication benefits and collaborative norms among students, instructors, staff and observers in UAEU in order to inform [indicate what this information will be used for] each other with educational information and updates.
Pitfalls or advice:	<ul style="list-style-type: none"> -Do not generalize findings to the rest of population (without appropriate inquiry/analysis) -Do not target seeking individualized responses (if so gather group consensus) -Aim for 5-8 participants per focus group -Conduct at least 1 focus groups for each variable of interest (e. g. Reputation, Privacy, Codification effort) -Conduct focus groups in different user types (Students, Instructors, staff, Observers) -Avoid mixing one sub-group with another that might inhibit expression of opinion -If the focus groups were audio taped, get a transcription of the discussion -Avoid compiling groups of people who associate very closely one another, if possible

FRAMEWORK FOR IMPLEMENTING SC IN HE IN GULF STATES

Activity Checklist

Plan the focus group	Focus group team activities and information	Status (e. g. Completed/not completed/requires attention)
Location	United Arab Emirates University (UAEU)	
Participants:	5 Instructors teaching Accounting, Organisation Behaviour, Civil Engineering, Chemical Engineering and Family Medicine	
Moderators	Khaled Hussein + Haitham Mekkawy (Volunteer instructor)	completed
List of questions/statements that need to discuss in the focus group	<p>13. How can SC support you in teaching your subject?</p> <p>14. Discuss the possibility of delivering your course content through online community portals and shared websites?</p> <p>15. SC enhances collaboration between parties. Up to which extent this can happen in your class and how do you see that beneficial for students? For teachers?</p> <p>16. How do you think SC can support the student's reputation between his peer colleagues? Will this affect the student's performance? How?</p> <p>17. Suggest some communication benefits of using SC in education?</p> <p>18. How SC can consolidate the relationships between learners? Learners and teachers? Organisation and stakeholders?</p>	completed

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2. Conduct the focus group.

Focus group team activities	Status (e. g. Completed/not completed/requires attention)
<p>Conduct the focus group(s) After each focus group, the researcher debriefed and summarized the focus group responses that include non-verbal observations.</p> <ul style="list-style-type: none"> • As the focus group, discuss and generate arguments as the researcher documents what participants said for each question and includes this in the summary report • Also note any other observations of interest or areas for improvement 	Completed

3. Analyse, interpret and share findings.

Focus group team activities	Status (e. g. Completed/not completed/requires attention)
<p>A. Analyse and interpret findings based on the focus group objectives, how to organize the analysis and reporting of the focus group data, i.e. findings by specific objective or by issue or by question</p> <ul style="list-style-type: none"> • Look for emerging themes in the text discussion • Look for group consensus or dissenting views • Look for degree of conviction in responses • Capture any key similarities in groups or notable differences. 	Completed
<p>B. Develop arguments based on your findings: The findings are to integrate with this research conducted as appropriately enhancing the body of the knowledge</p> <ul style="list-style-type: none"> • Describe findings by conducting an analyzing the transcript and note-taker's notes 	Completed

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Focus group4: Aspire Academy, instructor group 4

Focus Group:	Discussion on the expectations from learning environment when using Social Computing in Higher Education Courses
Aim:	Define set of needs and user preferences of the known Social Computing tools and ways of implementing them in Higher Education.
Objective statement:	Highlight the main sections of a new course website and the tools in each section which can help the students to learn easier, engage more and contribute to the class community from one side and help the instructors in delivering their courses in easier way with modern teaching and learning styles from the other side.
Pitfalls or advice:	<ul style="list-style-type: none">-Do not generalize findings to the rest of population (without appropriate inquiry/analysis)-Do not target seeking individualized responses (if so gather group consensus)-Aim for 5-8 participants per focus group-Conduct at least 1 focus groups for each variable of interest (e. g. Reputation, Privacy, Codification effort)-Conduct focus groups in different user types (Students, Instructors, staff, Observers)-Avoid mixing one sub-group with another that might inhibit expression of opinion-If the focus groups were audio taped, get a transcription of the discussion-Avoid compiling groups of people who associate very closely one another, if possible

Activity Checklist

1. Identify the factors that affect the student learning when using SC.

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Plan the focus group	Focus group team activities and information	Status (e. g. Completed/not completed/requires attention)
Location	Aspire Academy - Qatar	
Participants:	5 Instructors teaching Project Management and Social Studies	
Moderators	Khaled Hussein + Bassem Kashour (Volunteer instructor)	completed
List of questions/statements that need to discuss in the focus group	<p>19. Can SC enhance the Virtual Learning Environments (VLEs) with effective functionalities which might help students in their learning and engagement? How?</p> <p>20. Suggest main functionalities of SC services which could be included in new VLE? Why these functionalities? What are the expected reflections from them?</p> <p>21. Discuss the expected benefits from using SC websites to deliver content and deploy assessments?</p>	completed

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2. Conduct the focus group.

Focus group team activities	Status (e. g. Completed/not completed/requires attention)
<p>Conduct the focus group(s) After each focus group, the researcher debriefed and summarized the focus group responses that include non-verbal observations.</p> <ul style="list-style-type: none"> • As the focus group, discuss and generate arguments as the researcher documents what participants said for each question and includes this in the summary report • Also note any other observations of interest or areas for improvement 	Completed

3. Analyse, interpret and share findings.

Focus group team activities	Status (e. g. Completed/not completed/requires attention)
<p>A. Analyse and interpret findings based on the focus group objectives, how to organize the analysis and reporting of the focus group data, i.e. findings by specific objective or by issue or by question</p> <ul style="list-style-type: none"> • Look for emerging themes in the text discussion • Look for group consensus or dissenting views • Look for degree of conviction in responses • Capture any key similarities in groups or notable differences. 	Completed
<p>B. Develop arguments based on your findings: The findings are to integrate with this research conducted as appropriately enhancing the body of the knowledge</p> <ul style="list-style-type: none"> • Describe findings by conducting and analyzing the transcript and note-taker's notes 	Completed

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Appendix 5: Online Course System (OCS) prototype and other SW tools

This thesis includes attachment of software DVD includes the following items:

1. A copy of the prototype for OCS, as discussed in chapter 7 and chapter 8.
2. Version of the success measurement rating database tool.
3. Design screens that introduced in chapter 7.
4. The interview recordings are also attached on the DVD.

Readers should consult the readme file enclosed on the DVD for information on the different content items on the DVD.

Appendix 6: Online Course System (OCS) prototype: User interface documentation

The following screenshots are taken for the interface documentation purposes, and to clarify in the task of every functionality of the system.

The default login page is the Notifications' page where students can see the last course and university announcements:

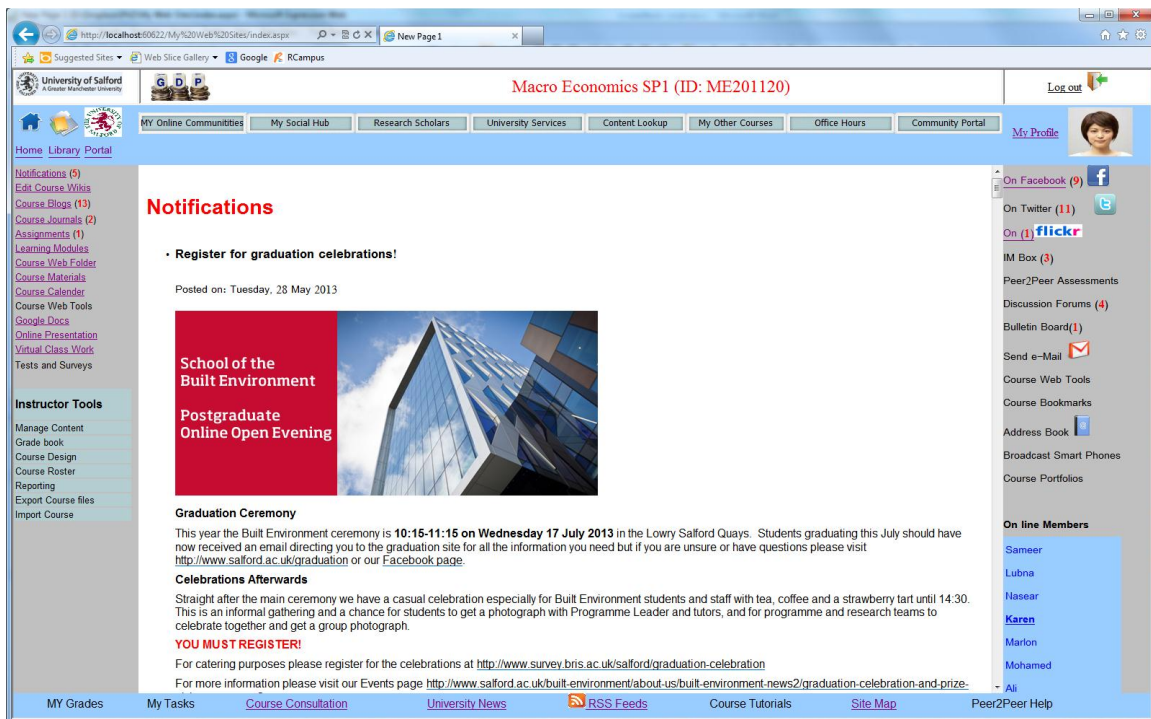


Figure A4-1: OCS Notifications

There is a link to the home page of the university/institution, the link called: 'Home' and exist on the top left corner of the website. Users may use it to access the public university web from inside OCS:

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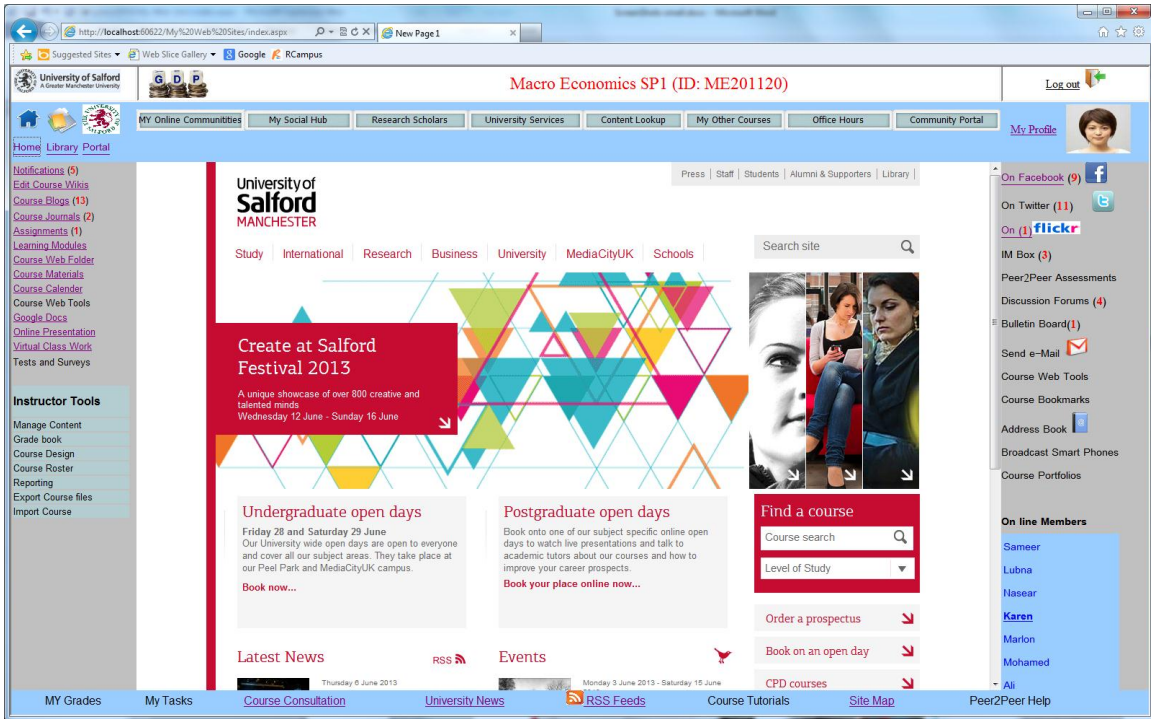


Figure A4-2: Institution Home Page

And link to the Library website, on the top left corner and called 'Library', where users can access library resources and add from its resources to the course content:



Figure A4-3: Library website

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And third link on the same location to the student portal website, where users can follow their activities from inside OCS:

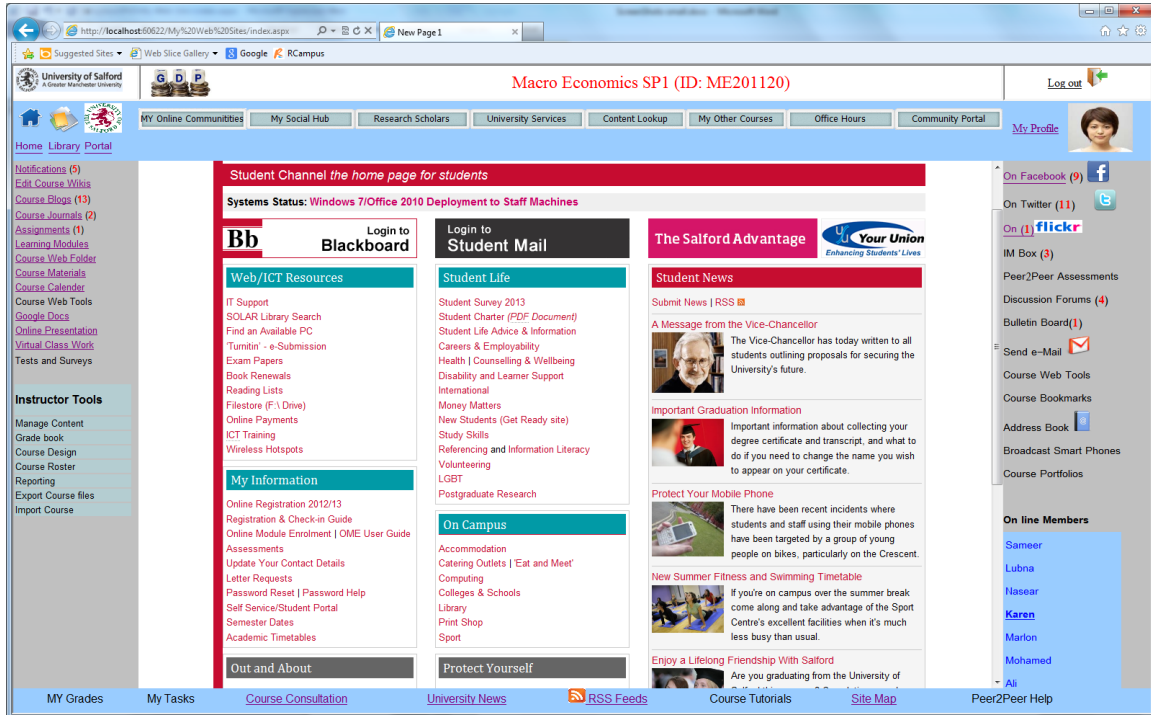


Figure A4-4: Student Portal

On the top right corner, there is 'My Profile' to edit the user's profile information:

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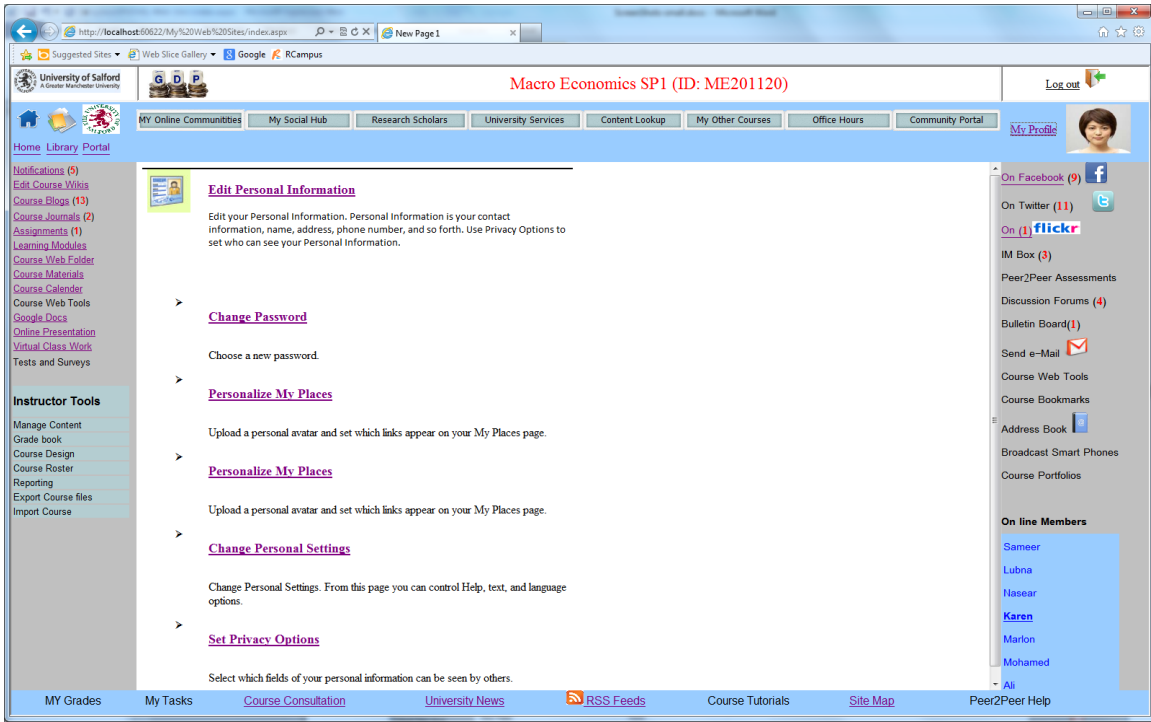


Figure A4-5: OCS User Profile

And here to edit the personal information:

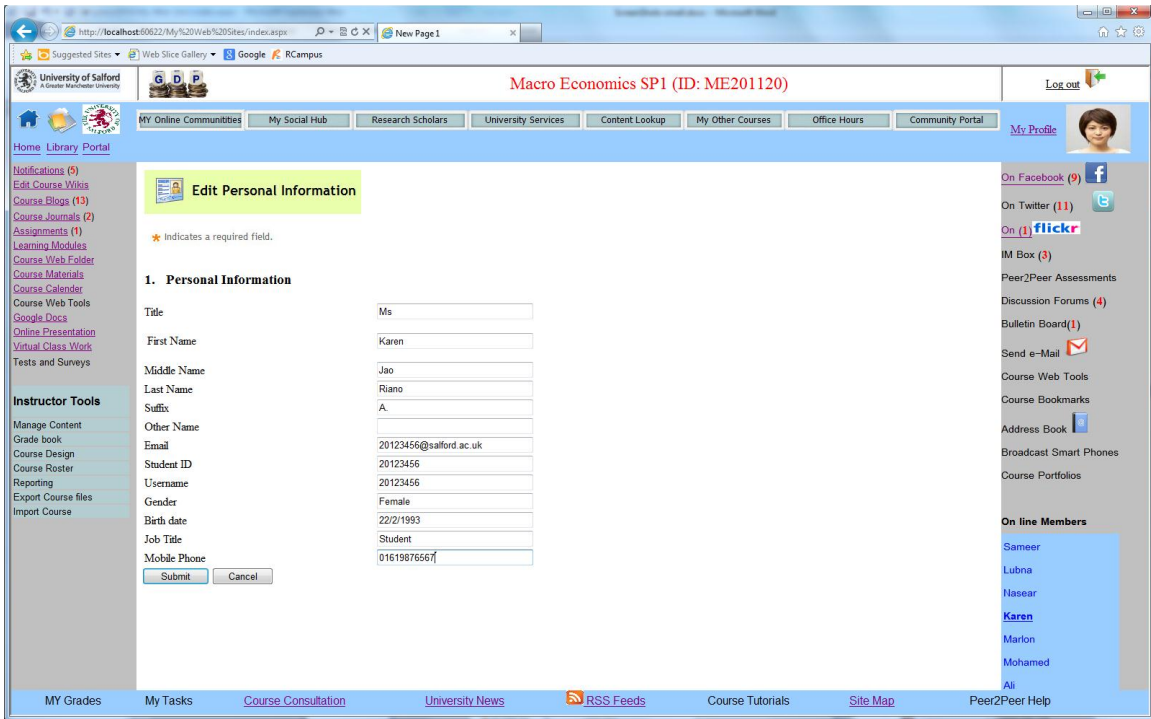


Figure A4-6: OCS Edit Personal Information

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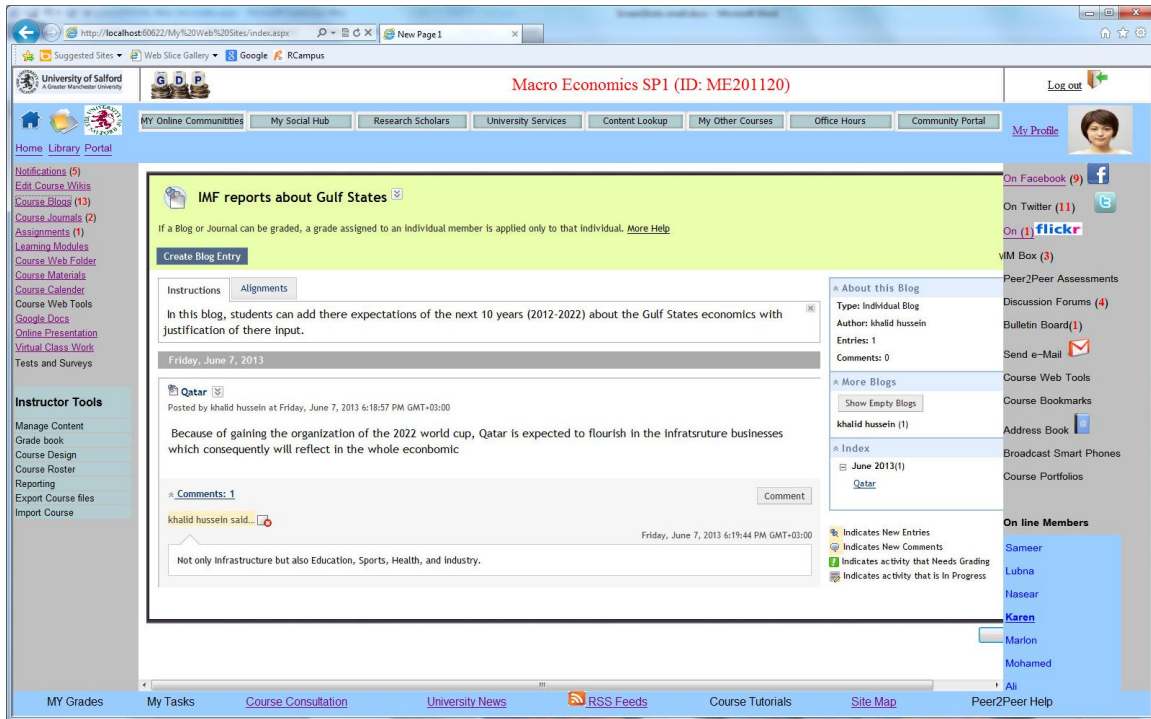
The right hand side menu includes link to the Facebook page for the course member, called 'On Facebook' . through this link users can get the last updates about each other's and exchange content between Facebook and OCS. They can also collaborate with the other course members who are online on Facebook.



Figure A4-7: OCS, On Facebook

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The left hand side menu includes link to course blogs' page, called 'Course Blogs'. Users can post and interact with each other in the course blog(s) and instructors can grade their posts.



The screenshot displays a web browser window showing a course blog page. The browser address bar shows a local host URL. The page title is "Macro Economics SP1 (ID: ME201120)". The left sidebar contains navigation links such as "Home", "Library", "Portal", "Notifications (5)", "Edit Course Wikis", "Course Blogs (13)", "Course Journals (2)", "Assignments (1)", "Learning Modules", "Course Web Folder", "Course Materials", "Course Calendar", "Course Web Tools", "Google Docs", "Online Presentation", "Virtual Class Work", "Tests and Surveys", and "Instructor Tools". The main content area features a "Create Blog Entry" button and a blog post titled "IMF reports about Gulf States" by "khalid hussein" on Friday, June 7, 2013. The post text discusses the organization of the 2022 world cup and its impact on the Gulf States economy. A comment from "khalid hussein" is visible below the post. The right sidebar includes social media links for Facebook, Twitter, and Flickr, a "VM Box (3)", "Peer2Peer Assessments", "Discussion Forums (4)", "Bulletin Board (1)", "Send e-Mail", "Course Web Tools", "Course Bookmarks", "Address Book", "Broadcast Smart Phones", "Course Portfolios", and "On line Members" with a list of names: Sameer, Lubna, Naseer, Karen, Marlon, Mohamed, and Ali.

Figure A4-8: OCS, Course Blogs

The right hand side menu includes link to the Flickr page for the course member, called 'On Flickr'. Here users can find additional resources for the course and its community members which makes them able to keep updates and exchange image content through it. :

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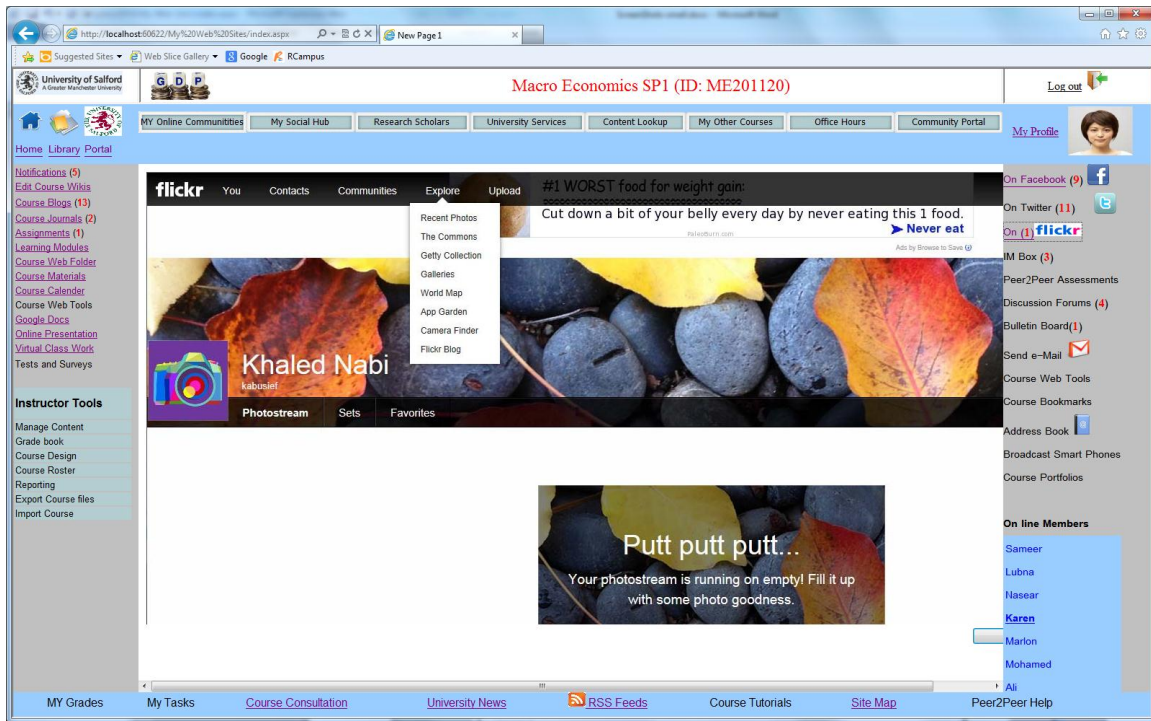


Figure A4-9: OCS, On Flickr

The left hand side menu includes link to course wikis page, called 'Edit Course Wikis'. Users can edit course blogs and instructors can grade their posts. It helps them enriching their language and share their knowledge.

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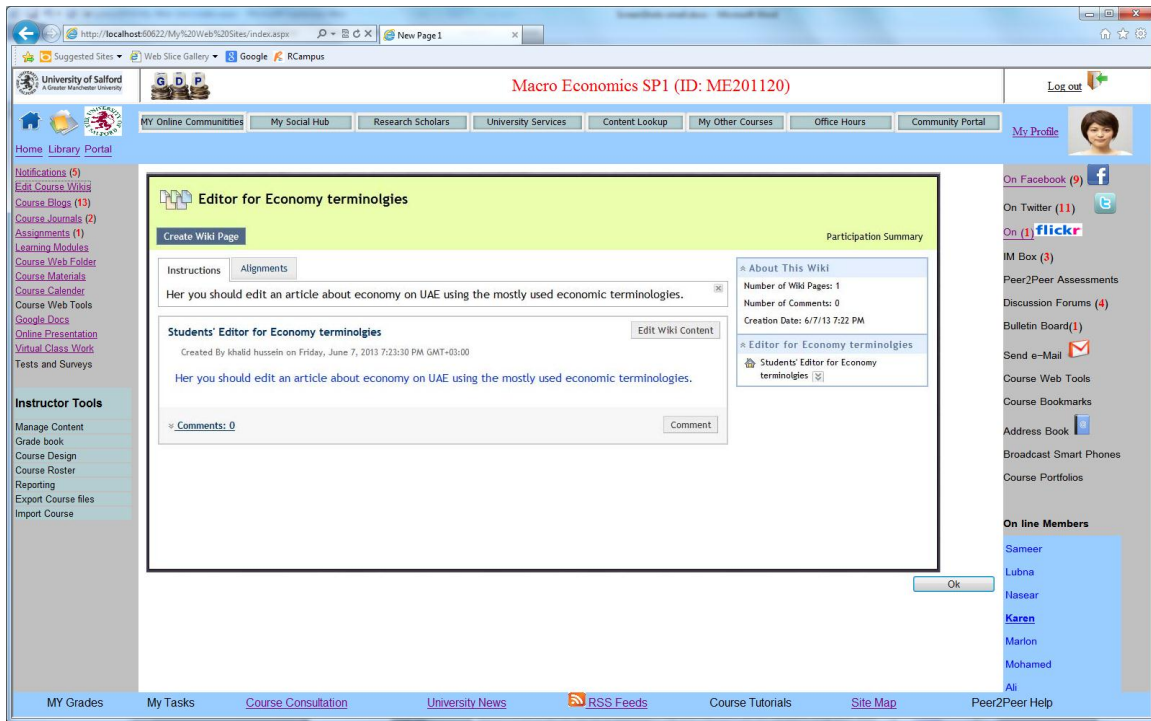


Figure A4-10: OCS, Course Wikis

The left hand side menu includes link to course journal page, called ‘Course Journals’. Users can edit course journals and instructors can grade their posts. It is also beneficial for exchanging thoughts and ideas.

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The screenshot displays a web browser window with the URL <http://localhost:60622/My%20Web%20Sites/index.aspx>. The page is titled "Macro Economics SP1 (ID: ME201120)" and is part of the University of Salford's online learning environment. The left-hand navigation menu includes links for "Home", "Library Portal", "Notifications (5)", "Edit Course Wikis", "Course Blogs (13)", "Course Journals (2)", "Assignments (1)", "Learning Modules", "Course Web Folder", "Course Materials", "Course Calendar", "Course Web Tools", "Google Docs", "Online Presentation", "Virtual Class Work", and "Tests and Surveys". The "Instructor Tools" section includes "Manage Content", "Grade book", "Course Design", "Course Roster", "Reporting", "Export Course files", and "Import Course".

The main content area features a "Journal of Economics in Gulf States" section. It includes a "Create Journal Entry" button and instructions: "In this journal, students can edit entries about the economical situation for each one of the Gulf States. Statistics might be uploaded, economic forecasts can be edited, questions might be posted also and peers can answer on". Below this, there is a section titled "Oil reserves in Saudi Arabia" with a date of "Friday, June 7, 2013". The text states: "Proven oil reserves in Saudi Arabia are the second largest claimed in the world, estimated to be 267 billion barrels ($42 \times 10^9 \text{ m}^3$) (Gbbbl hereafter) including 2.5 Gbbbl in the Saudi-Kuwaiti neutral zone. These reserves were the largest in the world until Venezuela announced they had increased their proven reserves to 297 Gbbbl in January 2011.^[21] The Saudi reserves are about one-fifth of the world's total conventional oil reserves, a large fraction of these reserves comes from a small number of very large oil fields, and past production amounts to 40% of the stated reserves."

A line graph titled "Proven Oil Reserves" compares Saudi Arabia (blue line) and Venezuela (red line) from 1980 to 2010. The Y-axis represents "Reported proven reserves for Saudi Arabia (blue) and Venezuela (red)" in Billion Barrels, ranging from 0 to 200. The X-axis represents "Year" from 1980 to 2010. Saudi Arabia's reserves are shown as a step function, increasing from approximately 100 billion barrels in 1980 to 267 billion barrels in 2010. Venezuela's reserves are shown as a line that starts at approximately 100 billion barrels in 1980, remains relatively flat until around 2005, and then rises sharply to approximately 297 billion barrels by 2011.

The right-hand sidebar includes social media links for Facebook (9), Twitter (11), and Flickr (1), as well as "IM Box (3)", "Peer2Peer Assessments", "Discussion Forums (4)", "Bulletin Board (1)", "Send e-Mail", "Course Web Tools", "Course Bookmarks", "Address Book", "Broadcast Smart Phones", and "Course Portfolios". The "On line Members" section lists: Sameer, Lubna, Nasear, Karen, Marlon, Mohamed, and Ali.

The footer of the page includes links for "MY Grades", "My Tasks", "Course Consultation", "University News", "RSS Feeds", "Course Tutorials", "Site Map", and "Peer2Peer Help".

Figure A4-11: OCS, Course Journals

The left hand side menu includes link to course Google Docs website, called 'GoogleDocs' for the logged user account. Here user can access their online drives and edit documents together online. It help more in the group work.

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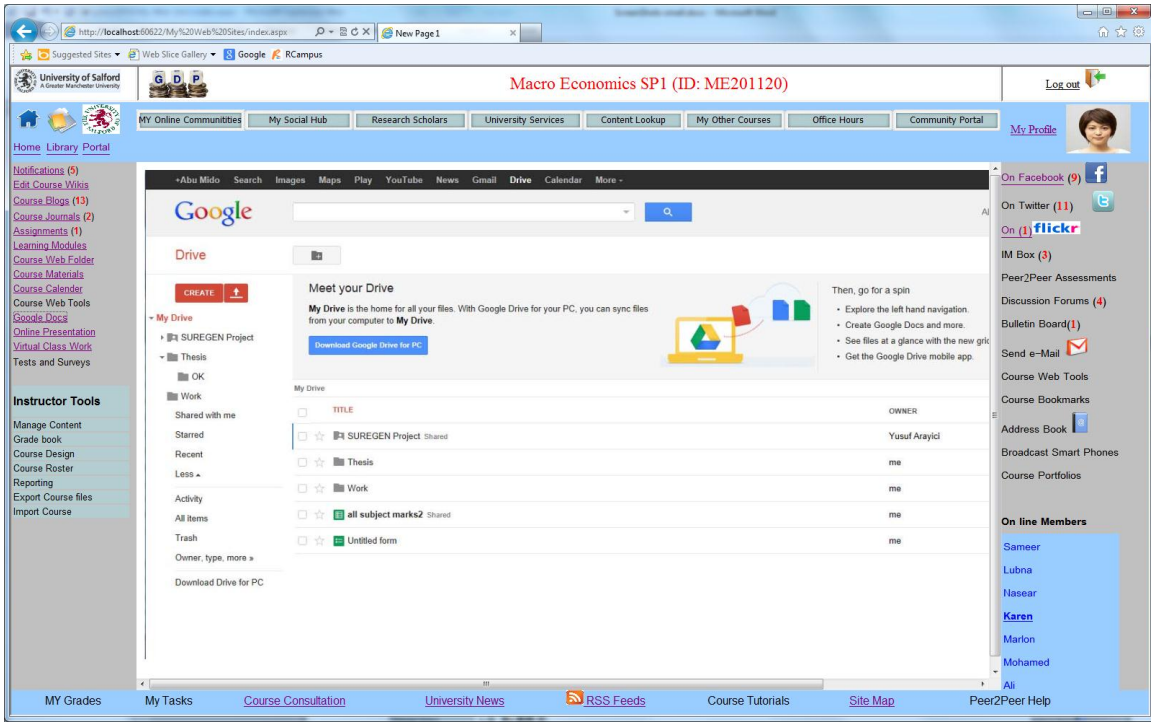


Figure A4-12: OCS, Google Docs

The left hand side menu includes link to course assignments, called assignments for the class. User can keep updated about what is required.



Figure A4-13: OCS, Course Assignments

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The left hand side menu includes link to course learning modules. Students can find assigned learning modules.

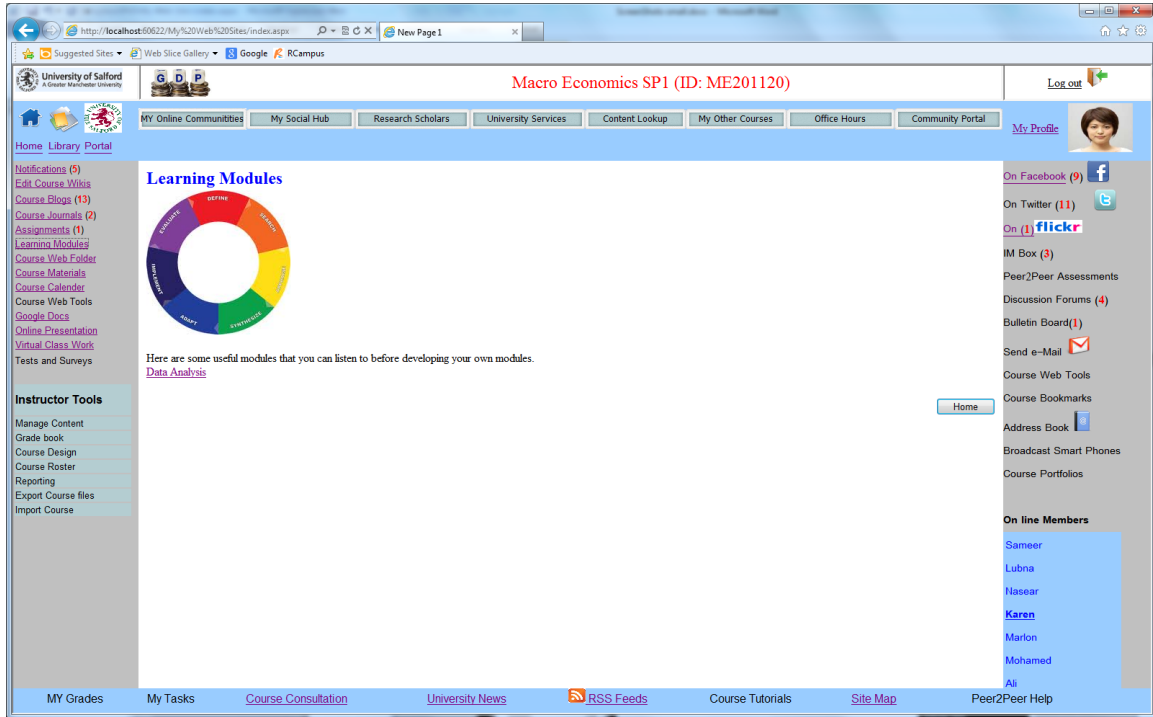


Figure A4-14: OCS, Learning Modules

More on Learning modules.

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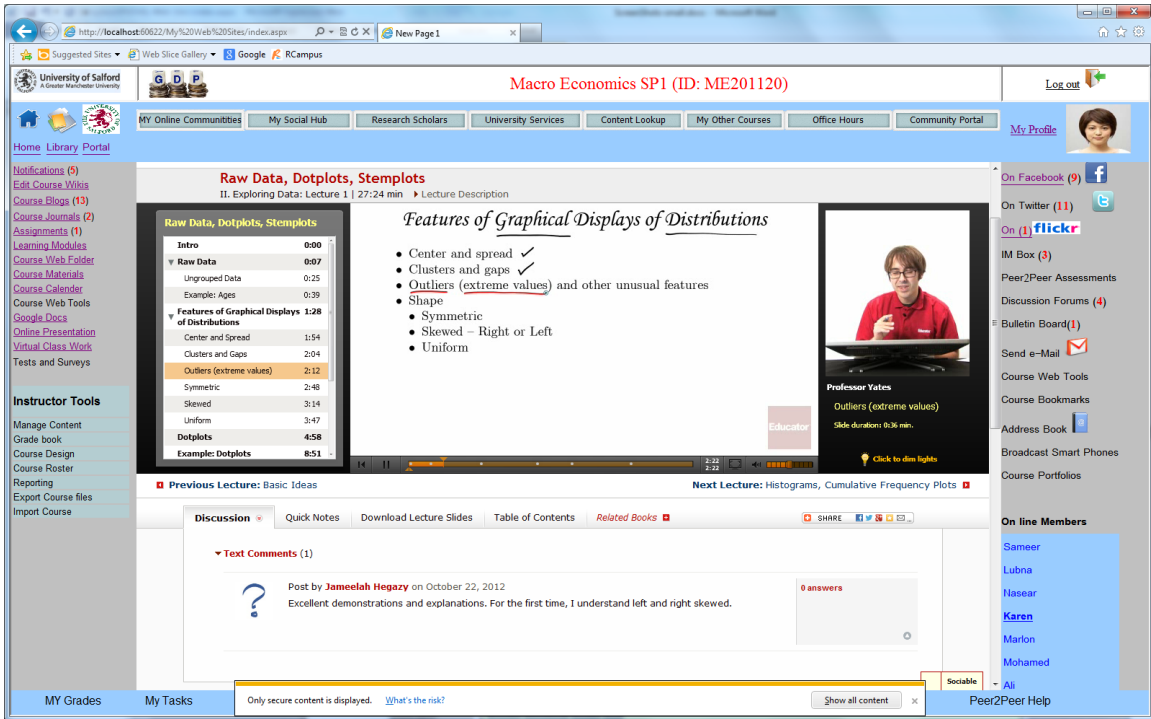


Figure A4-15: OCS, Learning Modules 2

The left hand side menu includes link to the online course Webfolder, where the course community can share and exchange files.

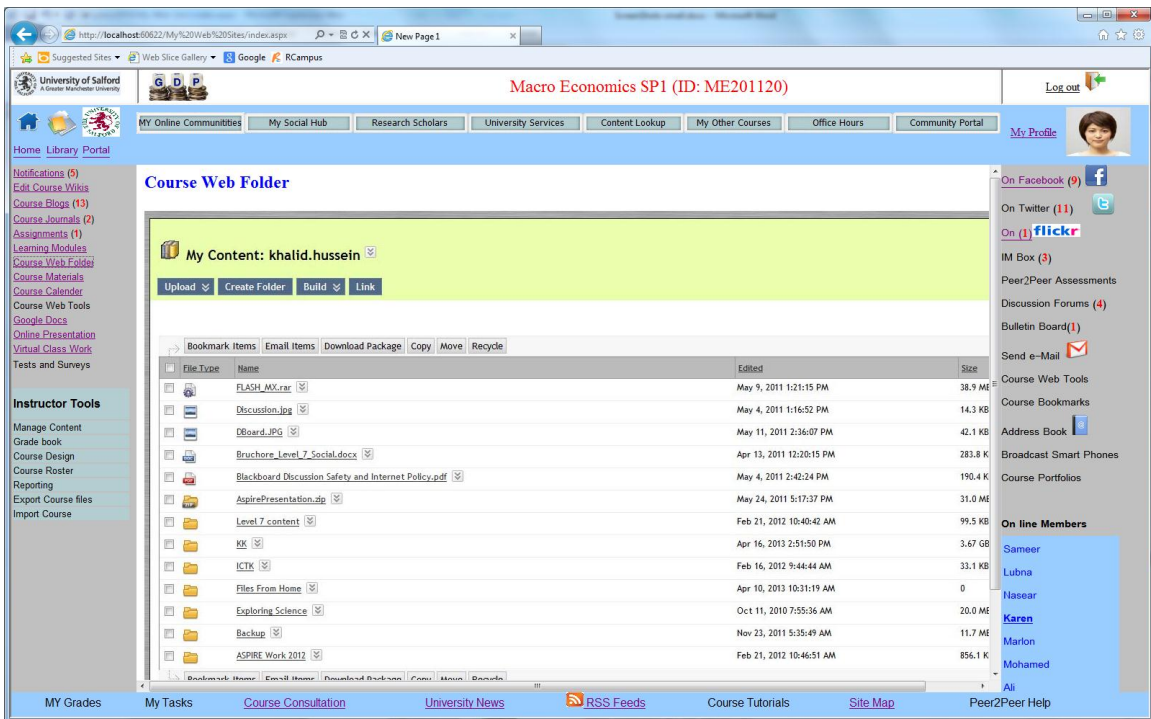


Figure A4-16: OCS, Course Web Folder

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The left hand side menu includes link to course Materials. Students can find learning Materials uploaded by their instructors.

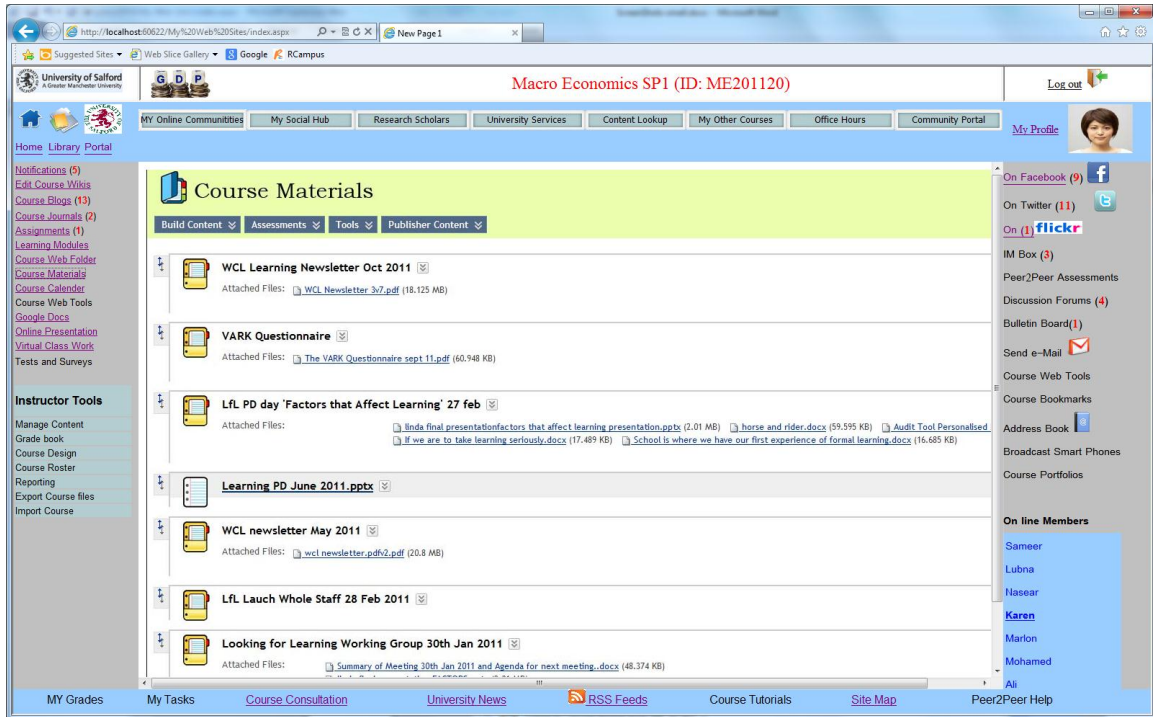


Figure A4-17: OCS, Course Materials

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Course Calendar to schedule course events like Mid-term exam and quizzes:

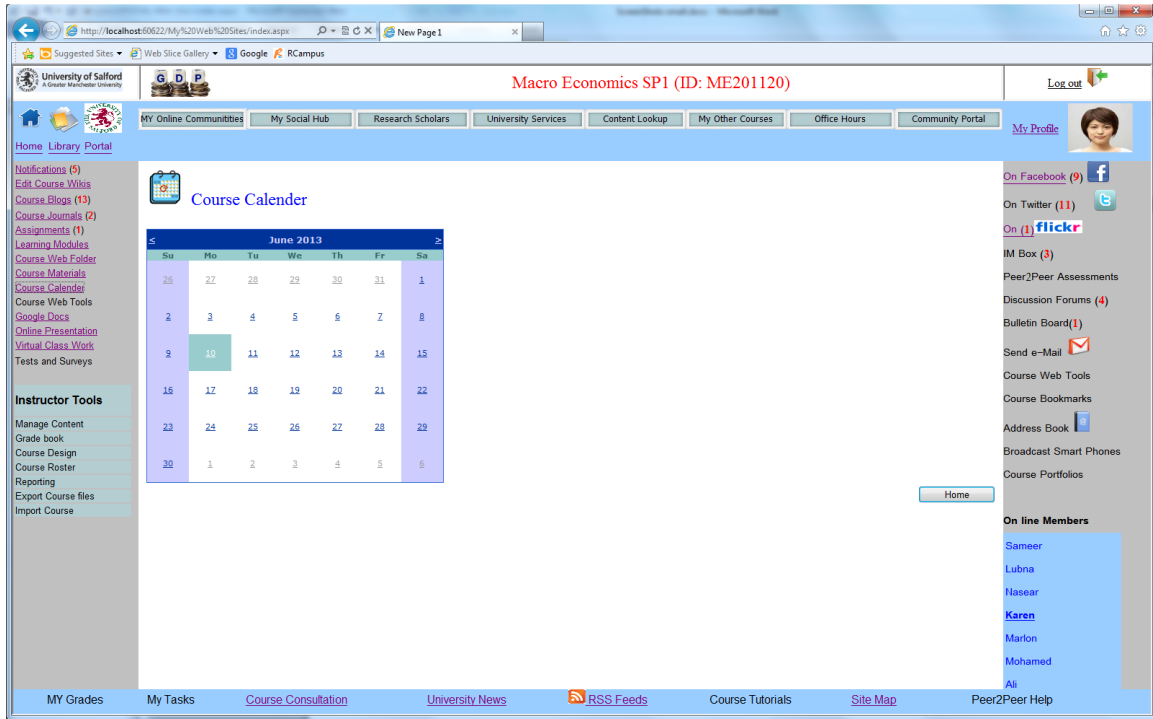


Figure A4-18: OCS, Course Calendar

Office Hours and Distance Learning available time and location for the course instructor:

FRAMEWORK FOR IMPLEMENTING SC IN HE IN GULF STATES

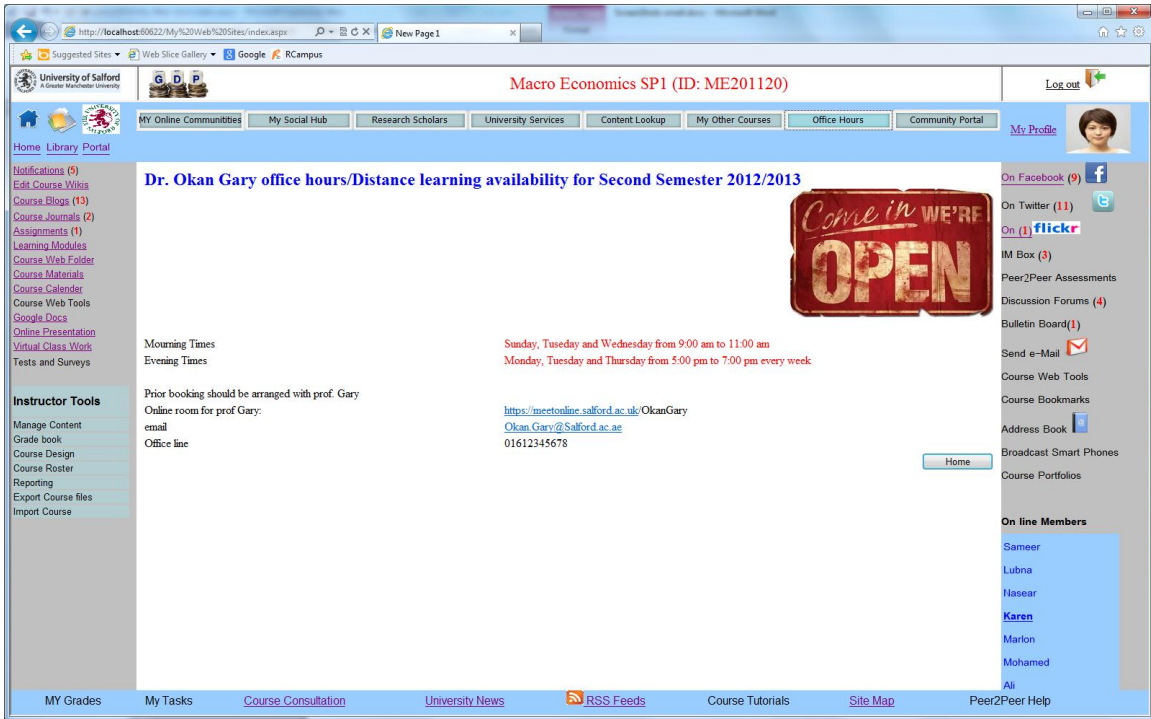


Figure A4-19: OCS, Office Hours

Course-Related RSS feeds:

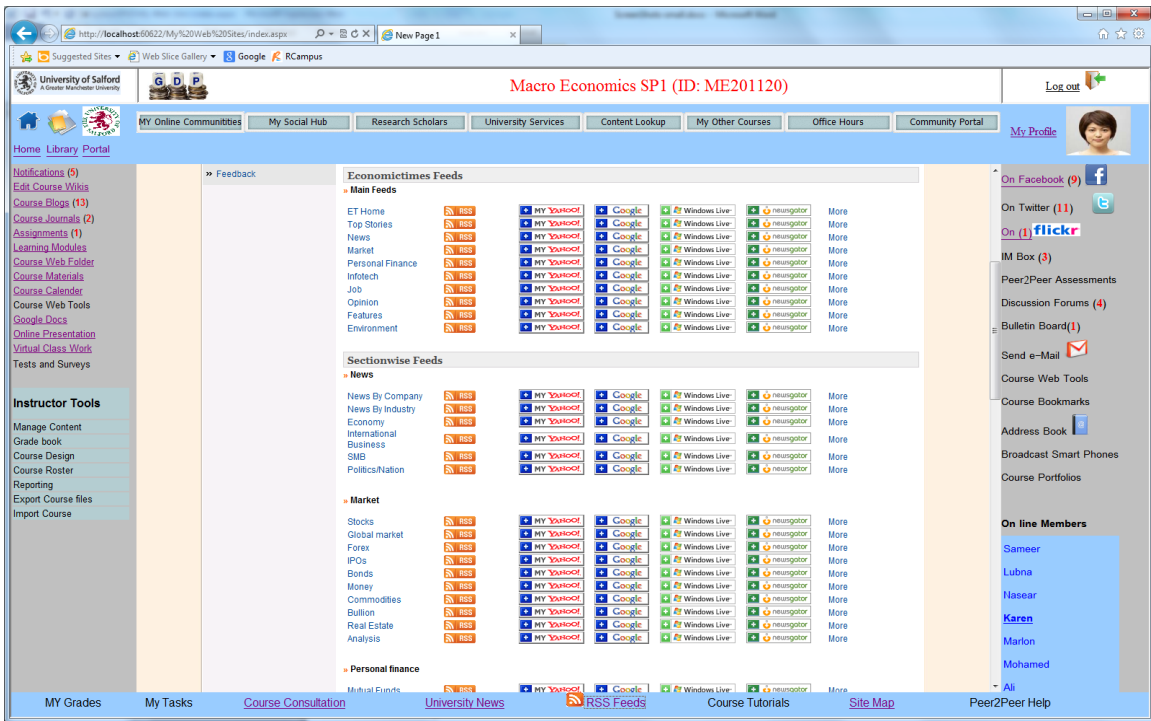


Figure A4-20: OCS, RSS feeds

FRAMEWORK FOR IMPLEMENTING SC IN HE IN GULF STATES

Site Map

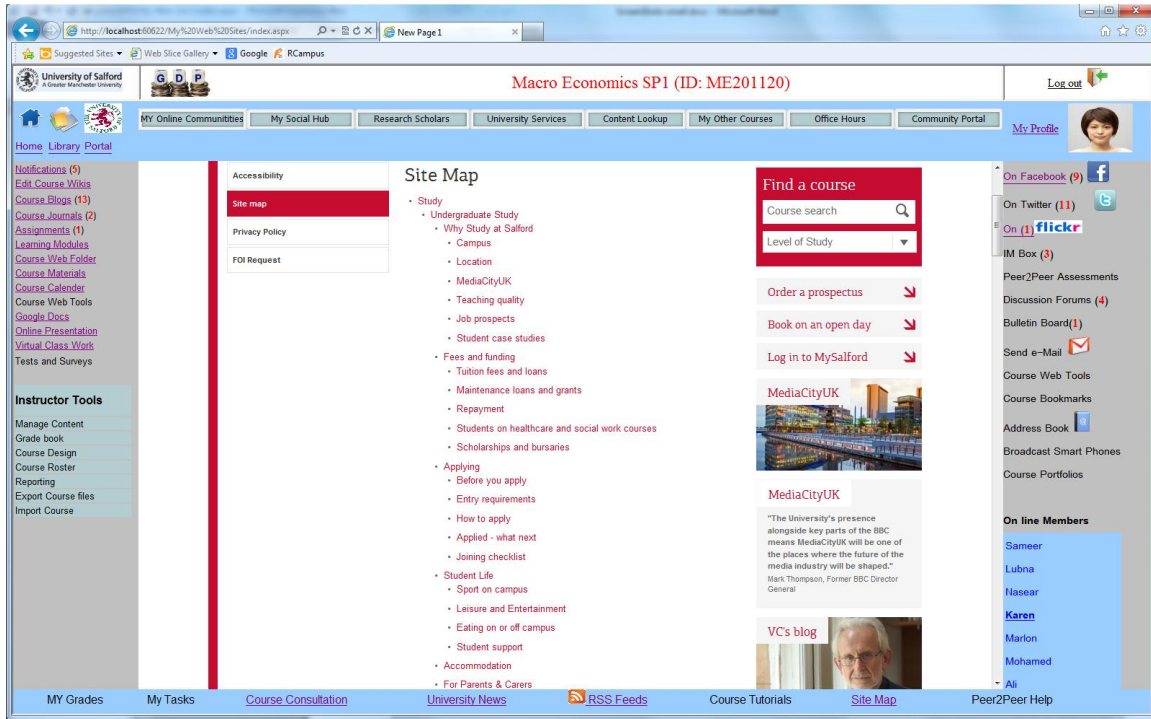


Figure A4-21: OCS, Site Map

University News



Figure A4-22: OCS, Institution News

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Peer to Peer Help and Chat box

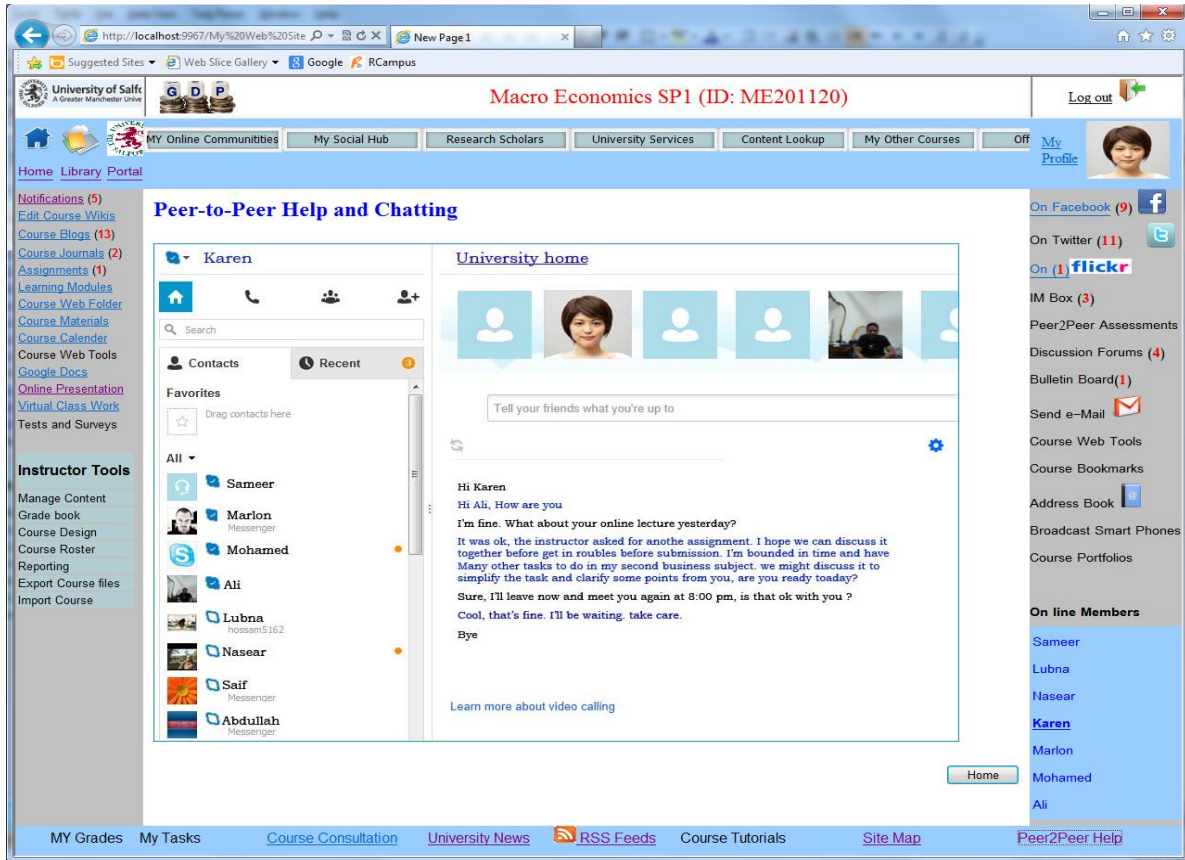


Figure A4-23: OCS, Peer to Peer Help

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The following screenshots document the measurement tool which was developed to measure the OCS system success based on user's feedback.

The following screenshot is the data entry screen designed for users to rate the different OCS functionalities after using it.

Variable	Add ration from 1 to 100	Description
OCS is easy to use?	100	OCS is easy to use
OCS is user friendly?	99	OCS is user friendly
OCS is stable?	60	OCS is stable
The response time of OCS is acceptable?	75	The response time of OCS is acceptable
OCS makes it easy for me to upload/download course content items	88	OCS makes it easy for me to upload/download course content items (files, folders, discussions, .. etc)
The interface words and phrases are clear and consistent?	78	The interface words and phrases provided by OCS are clear and consistent
Representation of the content is logical and fit?	90	The representation of the content provided by OCS is logical and fit
The content is important and helpful for my work?	77	The content or information provided by OCS is important and helpful for my work
The content is organized in meaningful and practicable way?	93	The content or information provided by OCS is organized in meaningful, understandable, and practicable way
The content classification in OCS is clear and unambiguous?	92	The content classification in OCS is clear and unambiguous
OCS provides contextual understandable content?	93	OCS provide contextual content or information so that I can truly understand what is being accessed and easily apply it to work
OCS provides accurate expert course page	90	
OCS provide complete learning portal?	92	OCS provide complete learning portal so that I can link to content or information sources
OCS provides educational social content items?	97	OCS provides educational social content items which benefits the class community in collaboration and facilitates content sharing.
OCS provides customizable learning environments?	99	
I am satisfied that OCS meets my information processing needs?	99	I am satisfied that OCS meets my information processing needs
I am satisfied with OCS efficiency?	70	I am satisfied with OCS efficiency
I am satisfied with OCS effectiveness?	70	I am satisfied with OCS effectiveness
Overall, I am satisfied with OCS?	97	Overall, I am satisfied with OCS
OCS helps me acquire new knowledge and innovative ideas?	97	OCS helps me acquire new knowledge and innovative ideas
OCS helps me to manage and store information that I need?	89	OCS helps me effectively manage and store information that I need
OCS enable me to accomplish tasks more efficiently?	90	OCS enable me to accomplish tasks more efficiently
My performance on the job is enhanced by OCS?	87	My performance on the job is enhanced by OCS
OCS improves the quality of my work life?	89	OCS improves the quality of my work life
OCS can help me to learn any time?	90	OCS can help me to learn any time

Figure A4-24: OCS measuring success, Data Entry

The following screenshot shows the average of each success variable by role (Student, staff, observer and instructor):

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OCS_SuccessMeasurementTool : Database (Access 2007) - Microsoft Access

Averages of Success Variables	
Averages_of:	Instructor
AvgOfOCS is easy to use?	91.7333333333333
AvgOfOCS is user friendly?	92.3333333333333
AvgOfOCS is stable?	71.8
AvgOfThe response time of OCS is acceptable?	82
AvgOfOCS makes it easy for me to upload/download course content	89.3333333333333
AvgOfThe interface words and phrases are clear and consistent?	89.5333333333333
AvgOfRepresentation of the content is logical and fit?	90.6
AvgOfThe content is important and helpful for my work?	90
AvgOfThe content is organized in meaningful and practicable way?	95.1333333333333
AvgOfThe content classification in OCS is clear and unambiguous?	87.4666666666667
AvgOfOCS provides contextual understandable content?	87
AvgOfOCS provide complete learning portal?	90.4
AvgOfOCS provides accurate expert course page	87.5333333333333
AvgOfOCS provides educational social content items?	86.4
AvgOfOCS provides customizable learning environments?	89.1333333333333
AvgOfI am satisfied that OCS meets my information processing nee	89.1333333333333
AvgOfI am satisfied with OCS efficiency?	72.6666666666667
AvgOfI am satisfied with OCS effectiveness?	71.6666666666667
AvgOfOverall, I am satisfied with OCS?	89.4
AvgOfOCS helps me acquire new knowledge and innovative ideas?	94.1333333333333
AvgOfOCS helps me to manage and store information that I need?	90
AvgOfOCS enable me to accomplish tasks more efficiently?	91
AvgOfMy performance on the job is enhanced by OCS?	89
AvgOfOCS improves the quality of my work life?	88.3333333333333
AvgOfOCS can help me to learn any time?	89
AvgOfOCS can facilitate my assignment work and uploads?	94.4
AvgOfOCS can be used to communicate my learning with colleagues?	90
AvgOfOCS can be used to share my general learning information?	89.2666666666667
AvgOfOCS can be used to share my specific learning information?	94.7333333333333

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Figure A4-25: OCS measuring success, Reporting1

The following screenshot shows the average of each success variable fro all:

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OCS_SuccessMeasurementTool : Database (Access 2007) - Microsoft Access

verages_of_All

Averages_of_All	
AvgOfOCS is easy to use?	90.3258426966292
AvgOfOCS is user friendly?	89.4494382022472
AvgOfOCS is stable?	71.0227272727273
AvgOfThe response time of OCS is acceptable?	85.3522727272727
AvgOfOCS makes it easy for me to upload/download course content	88.8522727272727
AvgOfThe interface words and phrases are clear and consistent?	87.4431818181818
AvgOfRepresentation of the content is logical and fit?	87.9545454545455
AvgOfThe content is important and helpful for my work?	90.6363636363636
AvgOfThe content is organized in meaningful and practicable way?	92.7272727272727
AvgOfThe content classification in OCS is clear and unambiguous?	89.0568181818182
AvgOfOCS provides contextual understandable content?	88.8295454545455
AvgOfOCS provide complete learning portal?	89.8522727272727
AvgOfOCS provides accurate expert course page	89.2386363636364
AvgOfOCS provides educational social content items?	90.3295454545455
AvgOfOCS provides customizable learning environments?	91.1363636363636
AvgOfI am satisfied that OCS meets my information processing nee	90.4318181818182
AvgOfI am satisfied with OCS efficiency?	73.0568181818182
AvgOfI am satisfied with OCS effectiveness?	78.0340909090909
AvgOfOverall, I am satisfied with OCS?	82.0340909090909
AvgOfOCS helps me acquire new knowledge and innovative ideas?	92.4204545454545
AvgOfOCS helps me to manage and store information that I need?	89
AvgOfOCS enable me to accomplish tasks more efficiently?	90
AvgOfMy performance on the job is enhanced by OCS?	90
AvgOfOCS improves the quality of my work life?	89.2613636363636
AvgOfOCS can help me to learn any time?	90.0909090909091
AvgOfOCS can facilitate my assignment work and uploads?	91.2613636363636
AvgOfOCS can be used to communicate my learning with colleagues?	89.8068181818182
AvgOfOCS can be used to share my general learning information?	92.7840909090909
AvgOfOCS can be used to share my specific learning information?	93.8181818181818

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Figure A4-26: OCS measuring success, Reporting 2

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