Adopting Social Computing in the Higher Education in the Gulf States: Conceptual framework

Khaled A. Hussein[1], Yusuf Aryaci[2] and Shafiz A. Mohd Yusof[3]
University of Salford,Manchester, UK[1, 2], Saudi Electronic University, Riyadh, KSA[3]
K.A.N.Hussein@edu.salford.ac.uk*, y.arayici@salford.ac.uk, s.mohdyusof@seu.edu.sa

*Corresponding author

ABSTRACT

This research sets out to develop a framework for adopting Social Computing (SC) tools and platforms in Higher Education (HE) institutions in the Persian Gulf States in order to leverage teaching and learning processes. Among other things, it reviews the known problems in HE in the Gulf States, best practices for using Social Computing in Higher Education, and the available literature on user acceptance of technology. It then addresses the known problems in HE and identifies the proper SC platforms for solutions with the support of the approved theories of user acceptance of technology.

In order to achieve the goals of this study, a set of research methods has been implemented by taking samples from the different HE stakeholders in the Gulf States to collect data about the significant factors that affect user acceptance when using SC in an educational context. The aim of the data collection is to highlight these factors and link them with the behavioral intentions of using SC in HE in order to propose a framework for the effective implementation of SC in HE in Gulf State institutions.

Once that aim being achieved, the society benefits more from its individuals and move toward higher levels of education, innovation and development.

1. KEYWORDS:

Framework, Gulf States, Higher Education, Social Computing, User acceptance, Web 2.0.

2. INTRODUCTION

In the last two years, the term *Web 2.0* has gained tremendous popularity. Web 2.0 is a term coined to explain the sharing of information on common platforms such as blogs, wikis, social bookmarking sites, microblogging sites, and social networking sites. All these technologies are based on the definition of SC. The impact of SC on businesses is that it keeps the consumer or end user at the center of all communication, and organizations build products and services based on consumer preferences. SC can also produce benefits such as innovation from group thinking and efficiency in gaining knowledge from the correct source.

There are many theories of information systems that aim to understand, in general terms, the attitudes and behaviors of individuals toward using any given technology. Examples include the theory of reasoned action (Ajzen, 1980), which studies the

relationship between attitudes and behavior. It suggests that when subjective norms (i.e., perceived expectations) are combined with attitude, it produces a particular behavior. Another such theory is the theory of planned behavior (Ajzen, 1985), which is an extension of the theory of reasoned action and the technology acceptance model by Davis et al. (1989). Venkatesh et al. (2003) summarized eight such related models and came up with a unified framework that contains factors that are similar in these eight models. The result is the unified theory of acceptance and use of technology (UTAUT). This model identifies performance expectancy, effort expectancy, social influence, and facilitating conditions as major factors that influence a particular behavior. They also added four moderating variables that significantly influence behavior or, in this case, the acceptance of using technology.

Gunther et al. (2009) made significant efforts to understand why and how people use microblogging. They conducted an experiment with four focus groups to select the important factors that play a role in the adoption of microblogging. The factors they considered were based on UTAUT as a theoretical foundation. The results of the experiment revealed eight important constructs that were very decisive in extending the UTAUT model to understand microblogging.

In this paper, it makes logical sense to use the same constructs or factors identified by Gunther et al. (2009) and extend them toward the adoption of all forms of SC in higher education (HE). To accomplish this task, sets of research methods are implemented in two stages to collect information about the important factors that might affect user acceptance when using SC in HE. The research methods include survey questionnaires and interviews. All were conducted with samples from the different HE stakeholders in the Gulf states.

3. RATIONALE FOR THE CURRENT RESEARCH

As a critically important institution, HE should be leveraged with tools that help maximize its generated value. In the Gulf states in particular, many challenges confront university teachers and students, making it harder to achieve teaching and higher-learning goals. These challenges—and how SC tools can serve as proper solutions—are listed below:

i. The Gulf states are categorized by Hall and Hall (2001) as high-context-culture societies. As a reflection of the culture, in schools male classes are segregated from female classes. Sometimes male zealots urge female students to cover up, even with the risk of sharp answers. This segregation reduces and sometimes prevents communication between male and female students, which consequently reduces learning and the sharing of knowledge between genders. SC platforms can serve as shared areas for more collaboration and discussion between students. Even for women who dislike being known by male parties—as per the cultural norms in the Gulf region, which make them think it is insulting to be known by others—SC tools can serve as suitable collaboration platforms for them.

ii. In the previous two decades, research in the Gulf states' higher institutions focused on growth rather than on development of the society itself (Shaw, 1997). Research emphasis in the Gulf institutions has now moved from

economic and technical growth to social and cultural development. The SC platforms serve as proper environments for socialization; thus, SC can play a major role in promoting student learning, especially in modern subjects and majors that focus on socialization and culture.

iii. Twenty-first-century Generation Y ("NetGen") students prefer to work in teams or in the form of peer-to-peer communication; they also like to be engaged in their learning, and they are more visually and kinesthetically inclined (Conrad, 2004). Many HE institutions in the Gulf states still use old teaching styles, which sometimes makes students feel bored, and consequently they become less engaged. More precisely, Linda Herrera (2006) denounced the inadequacy of HE in the Arab world relative to the fulfillment of students' social needs. Improving learning and teaching in Gulf HE institutions can be achieved by exploring new learning techniques, fashions, and up-to-date literatures in the different research areas. The SC platforms offer modern learning environments, making it easier for students to join virtual classes and contribute to blogs, wikis, and social websites where they can explore peer posts and learning materials. It helps students become more engaged in their learning.

iv. Poor research and redundancies in the most attractive disciplines are the two primary structural problems in HE in the Gulf states (Romani, 2009). Research on the Gulf states always focuses on oil and strategic matters, which means the higher institutions lack serious contributions in social development. The online collaboration offered by SC tools can help students by sharing knowledge and prompting new ideas, which is expected to increase innovation in research.

v. In most Gulf universities, English is the instructional language for the technical disciplines (Shaw, 1997). Shaw observed that although English is widely spoken in the Gulf states, formal writing in the areas of specialization needs improvement. SC tools are fundamentally writing platforms, and they lend themselves to improving foreign language skills. Blogs have been identified as successful environments for enhancing language skills and promoting creativity (Ducate, 2008).

4. SOCIAL COMPUTING

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

The following section introduces the SC applications that seem most suitable for learning and discusses their potential for use in HE. Some of these tools seem to overlap because of their integration or dependency on similar services, but

introducing them will show how they can be used in different ways to enhance student learning.

5. SOCIAL COMPUTING IN HIGHER EDUCATION

The meeting of minds is at the core of higher education, and SC can facilitate this meeting of minds regardless physical proximity. Thus, SC has a high potential for enhancing student learning in HE institutions. It helps make HE services that are linked to the institution more readily accessible and transparent to the different stakeholders of the HE institution.

Many universities reported that, they are using podcasts in education. A number of them have made the content of some courses available to the public through podcasts. In 2009, for example, Harvard University announced its second year of podcasting the computer science course E-1 Understanding Computers and the Internet; the course had many followers and appeared on the top 100 podcasts on iTunes[1]. Barkley University announced that 30 of its faculty members agreed to clip on microphones to record their lectures and publish them on the Internet as podcasts (http://itunes.berkeley.edu/). Through its early initiative, "Duke Digital Initiative," Duke University distributed 20 GB iPods to all first-year students to use as a learning tool. The plan was to deploy the educational technology, but one of the emerging technologies in their project was podcasting the classroom recordings and field recordings. The University of Washington conducted an online survey for podcasting; the results showed that 70% of students found that the podcasts supported their learning and were very helpful in studying for exams and preparing homework (Bell, 2007).

Nicole Ellison[2], a lecturer in an HE in the U.S., has used Facebook as teaching tool. She pointed out that Facebook made the subject more convenient and easily accessible for the students. She commented that Facebook provides a more engaging learning environment and enhances the peer-to-peer social component (Redecker, 2009).

Second Life[3], Entropia Universe[4], Dotsoul Syberpark[5], and Active Worlds[6] are all examples of virtual environments on the Internet. Second Life managed to attract millions of "active residents" and is still experiencing rapid growth (Pascu, 2008). In March 2007, about 500 universities and research centers, plus 2800 educators, were using Second Life (Calongne, 2007).

The New Media Consortium (NMC) conducted a survey in 2007 about using Second Life in education. The survey was taken by 209 educators who already used Second Life in their classes, and they reported multiple uses of it for educational purposes (NMC, 2008). Sixty percent of the surveyed educators had taken a class in Second Life, 51% had done activities such as supervising class projects on Second Life, 58% were planning to teach classes on Second Life, 50% were using it for class meetings,

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[1] http://computerscience1.tv/2011/spring/

[2] http://nellison.blogspot.com/2007/12/ecar-facebook-as-teaching-tool.html

[3] http://secondlife.com

[4] http://www.entropiauniverse.com

[5] http://www.dotsoul.net

[6] http://www.activeworlds.com

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% had taught a class entirely through Second Life, and 19% were planning to teach a course through Second Life.

Respondents expressed that they saw a high potential for deploying Second Life—and 3D virtual environments in general—in HE (94%). Eighty-seven percent saw significant use of Second Life in simulation and scenario activities. Eighty-six percent saw it as effective in artistic expression; 78% in group work, collaboration, and meetings; 74% in distance learning; 73% in team building; 68% in professional development; and 60% in teaching full courses.

An example of providing an online e-learning environment supported by virtual reality is an open-source project that integrates Second Life and Moodle into a new educational platform called Sloodle[7]. Sloodle aims to develop a sound pedagogical model for teaching in web-based 3D environments with all the features of the learning management systems; this is expected to make teaching easier and achieve higher rates of learning.

There are many other examples of educational social computing applications that were started as initiatives at some universities and are now available for free as open-source platforms. San Francisco-based initiative Wikispaces[8] is one example; it started in 2006 and provides thousands of wikis for free to serve educational purposes (Geser, 2007). Escribamos is another example of social computing software designed for education. It was developed by Calliope, a Belgian multilingual online writing center, and it works as collaborative writing environment and provides tools for creating e-portfolios (Opdenacker, 2007). Another example is MASSIVE, which is a peer-review service for universities (Attwell, 2007). The learning activity management system LAMS is another example; it was developed in the U.K. to provide several Web 2.0 tools for collaboration between students and educators (Aliyev, 2007).

6. THE UNIFIED THEORY OF ACCEPTANCE AND USE OF TECHNOLOGY (UTAUT).

Many theories and models that study user acceptance of technology have evolved over the last few decades. Al-Qeisi (2008) highlighted nine of these models as the base for the acceptance of web-based technologies and systems. Each one of these models defines certain constructs as the factors that affect user acceptance of technology. These models include the Theory of Reasoned Action (TRA), which evolved as a contribution of psychology to the field of technology acceptance (Ajzen and Fishbein, 1980). TRA was extended to form a newer model called the Theory of Planned Behavior (TPB; Ajzen, 1985). This model has in turn been extended to form a model called the Decomposed Theory of Planned Behavior (DTPB; Taylor & Todd, 1995). As a contribution of information systems to the field of technology acceptance, the next new model, called the Technology Acceptance Model (TAM; Davis, 1986)

[7] http://www.sloodle.org/

[8] http://www.wikispaces.com

was introduced as another extension of the Theory of Reasoned Action (TRA) and it also had an extension, TAM2 (Venkatesh & Davis, 2000). In addition to these, there is Roger's Diffusion of Innovations model (DOI; 1983), Bandura's Social Cognitive Theory (SCT; 1989), Deci & Ryan's Motivational Model (MM; 1985), and Triadis's Model of PC Utilization (MPCU; 1979). All of these models together were aggregated by Venkatesh et al. (2003) who noticed that information system researchers were confronted with either choosing among the range of the aforementioned models that included a mix of different constructs or choosing one of them and consequently ignoring the constructs of the others. So, they worked on unifying the views on technology acceptance into one model, which includes the most important constructs. They reviewed and compared the most dominant models for explaining technology acceptance behavior. These models included TRA, TPB, TAM, combined TAM - TPB, DOI, SCT, MM, and MPCU. Venkatesh et al. reported on the moderating variables that were studied during the previous research for these eight models. These factors included experience, voluntariness, age, and gender. Then, the authors examined commonalities among models and found seven constructs to be significant, direct determinants of intention or usage in one or more of the individual models. They reviewed the user acceptance literature and compared the different models to summarize those attitudes; computer self-efficacy and anxiety are hypothesized not to have a direct effect on behavioral intention. However, the following four constructs were hypothesized as playing a significant role and being a direct determinant of user acceptance and usage behavior. These four constructs are performance expectancy, effort expectancy, social influences, and facilitating conditions. The relationship among these constructs is shown in Figure 1-0.

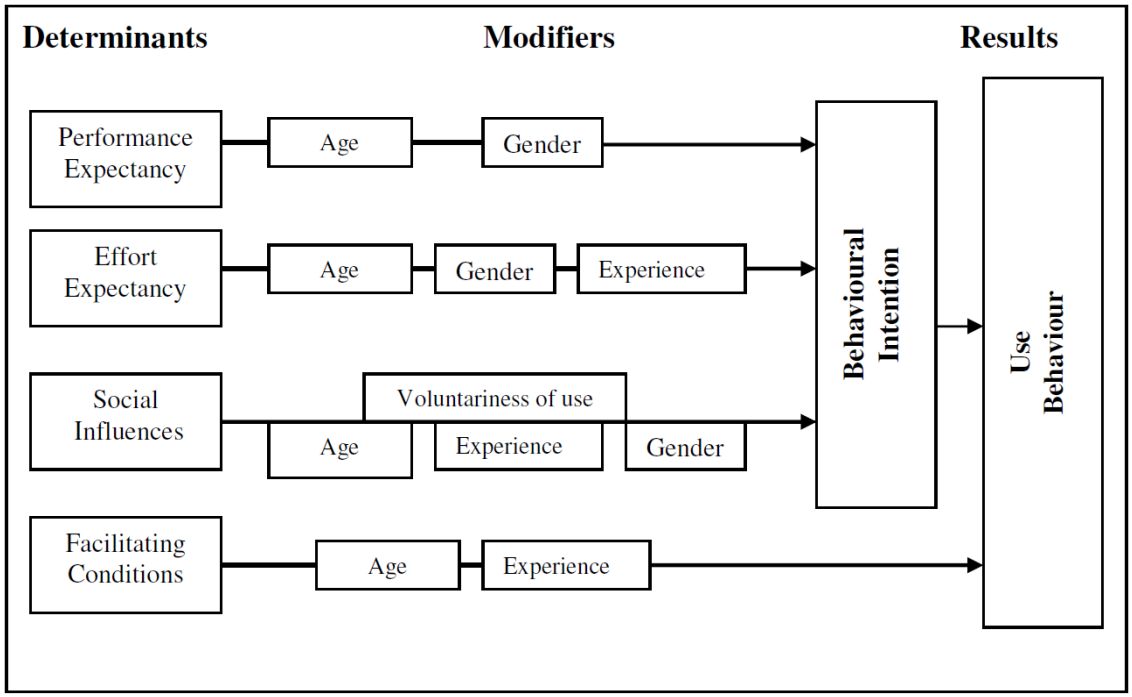

Figure 1-0: UTAUT, Source: Venkatesh et al. (2003)

The constructs in the model were defined and related to similar variables in the eight models as follows:

- **Performance Expectancy (PE)** *is the degree to which individuals believe that using the system will help them attain gains in job performance.*

Based on the literature, the influence of performance expectancy on behavioral intention is hypothesized to be moderated by gender and age; such an effect would be stronger for men, particularly younger workers.

- **Effort Expectancy (EE)** *is the degree of ease associated with the use of system.*

Based on the literature, the influence of effort expectancy on behavioral intentions is hypothesized to be moderated by gender, age, and experience; such an effect would be stronger for young women and older workers at early stages of experience.

- **Social Influence (SI)** *is the degree to which individuals perceive that important others believe they should use the new system.*

Equally, based on the literature, the influence of social influences on behavioral intentions is hypothesized to be moderated by gender, age, voluntariness, and experience; such an effect would be stronger for women, particularly in mandatory settings in the early stages of experience.

- **Facilitating Conditions (FC)** *is the degree to which individuals believe that an organizational 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 the 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.

7. PROBLEM STATEMENT AND RESEARCH QUESTIONS

The key problem statement of this research is understanding how effectively SC can be adopted in the HE institutions in the Gulf States to leverage teaching and learning processes and, in due process, achieve higher business value. This leads to identifying the following two research questions:

- How effectively can the SC tools be used in HE?
- What are the drivers of implementing SC in HE?

Answering these questions will lead to developing a new framework that defines how SC can be effectively deployed in HE in Gulf States institutions.

8. RESEARCH DESIGN – METHODS AND PROCEDURES

The data collection stage included a survey questionnaire that was answered by a total of 389 participants across the two organizations in the case study. This included 249 students, 52 instructors, 39 management staff, and 49 observers. The respondents communicated through frequent emails with links to surveys and through face-to-face requests during classes after receiving permission from their instructors. The researcher sent reminder emails to the targeted respondents to remind them about the questionnaire.

The respondents who were nominated were from the different HE institutions and included students, instructors, administrative staff, and observers. The majority of them were students and instructors who represented the main users of SC in an educational context. The respondents were identified by the case study organization to cover all grade levels, different majors, and different Gulf State nationalities.

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;
- the culture or country of origin;
- demographics; and
- experience in using the SC tools and technologies.

The collected data will be analyzed and discussed to extract the most important factors that play major role in determining the user acceptance of using SC in HE, and encourage or discourage them to use the SC tools for facilitating the learning and teaching processes. After this stage, the analysis of all the studied factors ends by developing new framework for implementing SC in the HE institutions in the Gulf States. The framework provides conceptual model of how SC can be implemented in HE to leverage the teaching and learning processes.

9. DATA ANALYSIS

Prior to analysis, the survey responses were examined using SPSS statistical software for accuracy of data entry, missing values, normality, and outliers. Routine descriptive statistics procedures were carried out using the descriptive analysis tools in SPSS. The missing data were below 5% for the collected answers. Hence, they were replaced by the mode value (Schumacker & Lomax, 2004; Hair et al., 2006). The findings of these statistics for the four user samples are presented below.

9.1. Analysis of the collected data on the use of internet and SC

The following lists the statistics of the collected data to highlight important characteristics of the surveyed samples on the side of using SC services:

- The level of experience in using Internet and computers showed that all the samples use the Internet more than 10 hours per week (97% of

surveyed users). Most of them (98%) have e-mail accounts, and 75% have used the Internet for more than one year.

- The demographic analysis of the surveyed samples showed that 72% were male and 28% were female (represented in Figure 1.1).

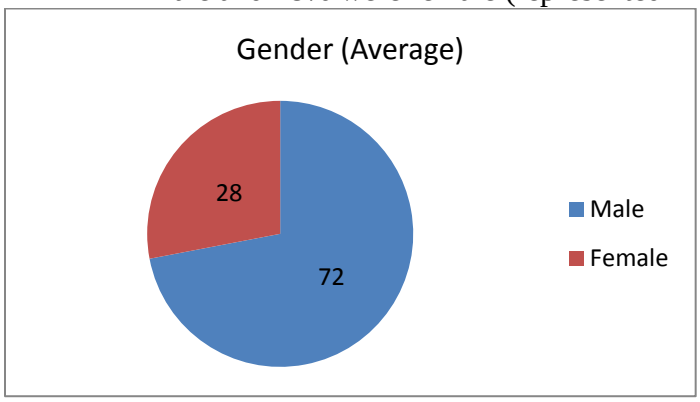

Figure 1.1: Respondents by Gender

- The surveyed samples included 133 respondents from United Arab Emirates (UAE), 177 from Qatar, 39 from Oman, 12 from Bahrain, and 28 from non-Gulf countries. This means that 92.9% were Gulf citizens, and 7.1% were of non-Gulf nationality but living in the Gulf either to study or work. Hence, all sample members were aware of the Gulf states' cultural norms. The two ratios are represented in Figure 1.2.

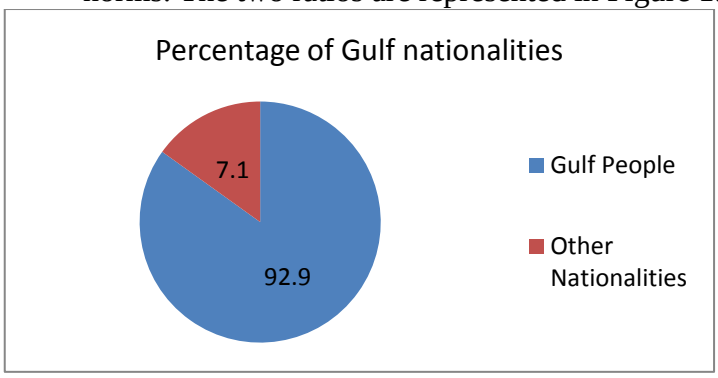

Figure 1.2: Respondents by Nationality

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

- More social activities that support educational motivation are needed.
- The search tools on the SC websites, especially for learning content, could be enhanced to facilitate research activities on these sites.
- The online content of the SC websites needs to be enhanced by compressing it into more lightweight packages. This would facilitate faster browsing and downloads.
- Extend the social websites to integrate with educational websites.
- Add more gaming content.
- All social networks should be free-of-charge services.

- There should be more enhanced security and privacy.
- Integrity matters a lot and should be considered in the newer versions.
- More education-oriented communities should be developed.
- Smoother video calling is needed.

9.2. Analysis of the collected data on the technology use factors

Here we analyze and discuss the collected data about the acceptance of using SC in HE in the Gulf states. This includes an analysis of the collected data from the survey questionnaire.

The survey included set of questions on every use factor of the studied factors in this research; the factor was either newly constructed or constructed from the UTAUT model. Table 1.1 displays the studied factors of technology acceptance with the factor-question relationship. For instance, questions 3 and 4 were offered to collect user opinions about the significance of "reputation" as a usage factor. Similarly, questions 5 and 9 were offered to collect user opinions about the significance of "expected relationships" as a usage factor.

Table 1.1: Hypothesized Factors – Related Questions

Use Factor	Related questions
REPUTATION	Questions 3,4
EXPECTED RELATIONSHIPS	Question 5,9
COMMUNICATION BENEFITS	Question 6,12
SIGNAL-TO-NOISE RATIO	Questions 7,8
CODIFICATION EFFORT	Questions 9,10
PRIVACY CONCERNS	Questions 11,12,13
COLLABORATIVE NORMS	Questions 14,15
FACILITATING CONDITIONS	Questions 16,17,18

Every question in the survey had 5 options from the Likert scale for the respondent to choose from. Each option was assigned a value as shown in table 1.2.

Table 1.2: Survey measures

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

The initial survey was altered many times and translated into Arabic to ensure easy understanding of its questions; it was checked to see if some questions could be eliminated or merged. For each factor, the offered questions were titled Reputation1, Reputation2, Facilitating Conditions1, Facilitating Conditions2, and Facilitating Conditions3, where Reputation1 means the first question on the "Reputation" factor, which is defined as question 3. Similarly, question 4 represents Reputation2 and so forth.

The first step of data analysis included testing the correlation between the different questions to ensure correlation between the different variable dimensions. The results of correlation confirmed strong links between the different questions of the same variable. Table 1.3 shows the correlation testing results.

Table 1.3: Correlation testing results

Question / Dimension	Reputation1	Reputation2	Expected Relationships	Communication Benefits	Signal To Noise1	Signal To Noise2	Codification Effort1	Codification Effort2	Privacy Concerns1	Privacy Concerns2	Privacy Concerns3	Collaborative Norms1	Collaborative Norms2	Facilitating Conditions1	Facilitating Conditions2	Facilitating Conditions3
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 Relationships			1.00	**.492**	**-.001**	**.571**	**.379**	**.534**	**.499**	**.022**	**.153**	**.520**	**.511**	**.468**	**.494**	**.515**
Communication Benefits				1.00	**-.097**	**.581**	**.347**	**.573**	**.419**	**.035**	**.136**	**.561**	**.504**	**.560**	**.426**	**.430**
Signal To Noise1					1.00	**.623**	**.119**	**-.015**	**.081**	**.639**	**.583**	**.004**	**.014**	**.011**	**.166**	**.180**
Signal To Noise2						1.00	**.372**	**.549**	**.409**	**.085**	**.155**	**.532**	**.561**	**.526**	**.516**	**.421**
Codification Effort1							1.00	**.459**	**.554**	**.031**	**.290**	**.425**	**.516**	**.484**	**.459**	**.316**
Codification Effort2								1.00	**-.047**	**.034**	**.143**	**.581**	**.605**	**.634**	**.530**	**.450**
Privacy Concerns1									1.00	**.582**	**.616**	**.618**	**.692**	**.636**	**.549**	**.416**
Privacy Concerns2										1.00	**.580**	**.013**	**-.044**	**-.017**	**.104**	**.238**
Privacy Concerns3											1.00	**.155**	**.180**	**.179**	**.316**	**.317**
Collaborative Norms1												1.00	**.645**	**.624**	**.539**	**.506**
Collaborative Norms2													1.00	**.714**	**.582**	**.441**
Facilitating Conditions1														1.00	**.514**	**.478**
Facilitating Conditions2															1.00	**.513**
Facilitating Conditions3																1.00

The correlation numbers in Table 1.3 prove that the different questions on the same factors successfully test the factor. For instance, there is a correlation level of 0.623 (62.3%) between "Signal To Noise1" and "Signal To Noise2." Similar findings are between the other factors' questions.

Using SPSS, custom tables have been developed to express the whole dimensions based on the survey measures that are illustrated above in table 1.2. Table 1.4 below shows the results.

Table 1.4: The whole dimensions based on the survey measures

Survey measure →	**5**		**4**		**3**		**2**		**1**	
Question/Dimension↓	Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %
Reputation1	275	55.7%	131	26.5%	80	16.2%	4	.8%	4	.8%
Reputation2	254	52.2%	144	29.6%	74	15.2%	10	2.1%	5	1.0%
Expected Relationships	228	46.5%	165	33.7%	83	16.9%	5	1.0%	9	1.8%
Communication Benefits	247	50.2%	158	32.1%	68	13.8%	11	2.2%	8	1.6%
Signal To Noise1	104	21.2%	83	16.9%	98	20.0%	160	32.6%	46	9.4%
Signal To Noise2	191	39.1%	174	35.7%	109	22.3%	4	.8%	10	2.0%
Codification Effort1	184	37.2%	169	34.2%	98	19.8%	33	6.7%	10	2.0%
Codification Effort2	199	41.1%	145	30.0%	113	23.3%	20	4.1%	7	1.4%
Privacy Concerns1	222	45.1%	146	29.7%	107	21.7%	8	1.6%	9	1.8%
Privacy Concerns2	107	21.7%	116	23.5%	115	23.3%	110	22.3%	46	9.3%
Privacy Concerns3	111	22.7%	88	18.0%	221	45.2%	58	11.9%	11	2.2%
Collaborative Norms1	219	44.2%	130	26.2%	122	24.6%	13	2.6%	12	2.4%
Collaborative Norms2	200	40.5%	150	30.4%	119	24.1%	12	2.4%	13	2.6%
Facilitating Conditions1	232	47.7%	123	25.3%	112	23.0%	11	2.3%	8	1.6%
Facilitating Conditions2	197	39.8%	189	38.2%	96	19.4%	9	1.8%	4	.8%
Facilitating Conditions3	153	31.0%	221	44.7%	106	21.5%	1	.2%	13	2.6%

The results in Table 1.4 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 the respondents strongly agreed on reputation as an important 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.

In table 1.5, the percentage of optimism defines the average of the extent to which individuals agree or disagree with a particular statement in the questionnaire. Optimism is expressed by the "Strongly Agree" and "Agree" answers. The mode identifies the response that was received the most number of times. Table 1.5 illustrates the results from the analysis of all the received responses of the survey regarding the factors that affect user acceptance of using SC in HE, grouped by user category. It was observed that the clear revelation from all responses is that, for the

most part, they were consistent across all the surveyed samples (students, instructors, staff, and observers).

Table 1.5: Factor survey analysis-part1

Question	Factors	Students (252)		Instructors (114)		Management (78)		Observers (49)	
		Optimism	**Mode**	**Optimism**	**Mode**	**Optimism**	**Mode**	**Optimism**	**Mode**
3	**Reputation**	89%	5	88%	5	86%	4	88%	5
4		86%	5	84%	4	83%	4	74%	4
5	**Expected Relationships**	84%	4	84%	5	83%	4	82%	4
6	**Communication Benefits**	88%	4	76%	4	79%	4	74%	4
7	**Signal to Noise Ratio**	53%	2	68%	3	74%	2	49%	2
8		88%	4	92%	5	90%	4	94%	5
9	**Codification Effort**	72%	5	76%	5	74%	4	63%	3
10		88%	5	84%	4	84%	4	82%	4
11	**Privacy Concerns**	92%	5	88%	4	94%	5	87%	5
12		65%	3	60%	2	75%	3	52%	3
13		68%	3	84%	4	84%	4	63%	4
14	**Collaborative Norms**	83%	5	90%	4	80%	4	82%	4
15		79%	4	92%	5	76%	3	71%	3
16	**Facilitating Conditions**	74%	5	74 %	5	77%	5	72%	5
17		49%	4	64%	4	42%	4	52%	4
18		78%	4	92%	5	78%	4	78%	4

10. DISCUSSION OF FINDINGS

10.1. Findings from the data analysis of the use of SC question answers

The answers from the first part of the survey (questions 1 and 2) reflected the following general conclusions:

- The high tendency of university-level students and staff to socialize all the time and keep communicating with their peers

- Clear desire to exploit the social networks in getting access to online content and communicating with other colleagues
- The user tendency to learn and socialize while learning using social networking services

The user responses to the open-ended question in the survey (the last question) reflected their interest in education through SC services. The answers included some words or ideas related to facilitating access to content, enhancing the content itself, developing new integration between education websites and social networks, enhancing the security of content and user privacy, and developing the technical side of these websites to be more effective in learning and education. These concerns reflect a user concern with developing social websites to serve more toward learning and socialization.

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

The following eight passages include comparisons between the data collected from the survey results from one side and the hypothesized factors by UTAUT from the other. This comparison will lead to proving user acceptance of using SC in HE to gain more benefits in learning or teaching activities.

i. **Reputation**: the UTAUT model hypothesizes a strong link between user acceptance of any new technology and gaining a more positive reputation in his or her community. The survey results of the reputation-related questions show that there is a strong link (optimism levels of 74%, 83%, 84%, 86%, 88%, and 89% across the samples as shown in Table 1.5). Therefore, the survey results on using SC in HE prove same hypothesis as UTAUT. The above data are consistent across all samples, confirming the strong link of reputation with performance expectancy and with behavioral intention. In addition, the numbers show that this factor has the strongest link among all hypothesized relationships. Hence, a new link path could be constructed as shown in Figure 1-3.

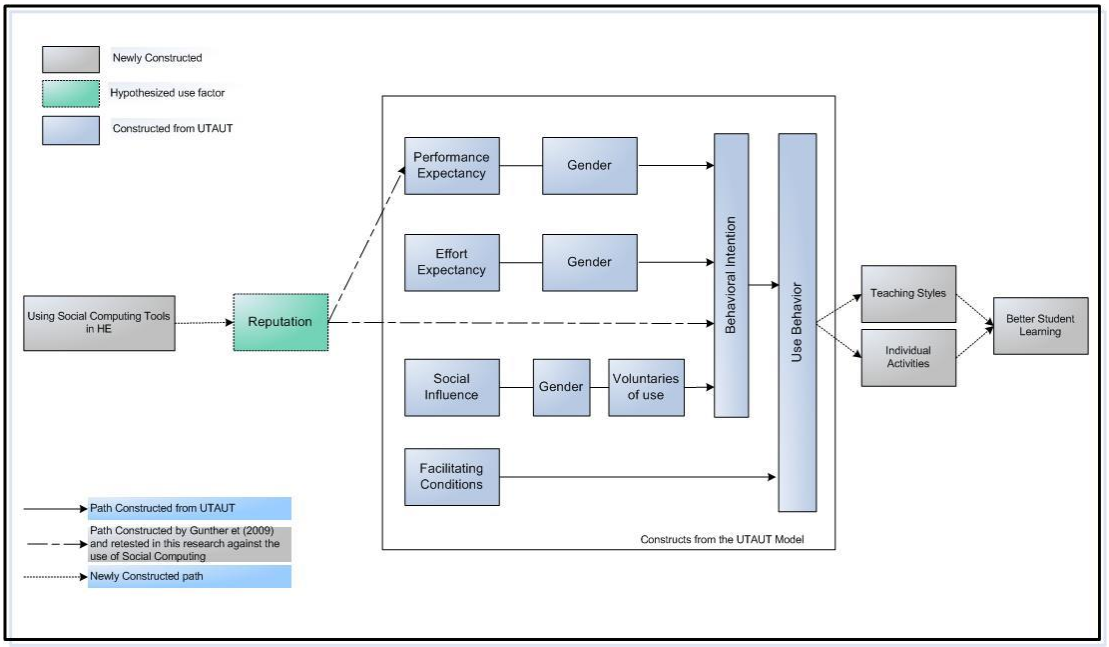

Figure 1-3: Reputation factor

ii. **Expected Relationships:** The results from question 5 about the expected relationships are not as strong as reputation but still confirm strong relationships across all samples. An average mode of 4 (optimism levels of 82%, 83%, and 84% as shown in Table 1.5) across all samples in question 4 shows the mind-set of all participants toward their behavior to deliberately use SC to create relationships and receive benefits. Hence, another link path can be constructed between using SC in academic institutions and the "Expected Relationships" construct, which is positively related to behavioral intentions and performance expectancy. Figure 1-4 shows the new constructed path.

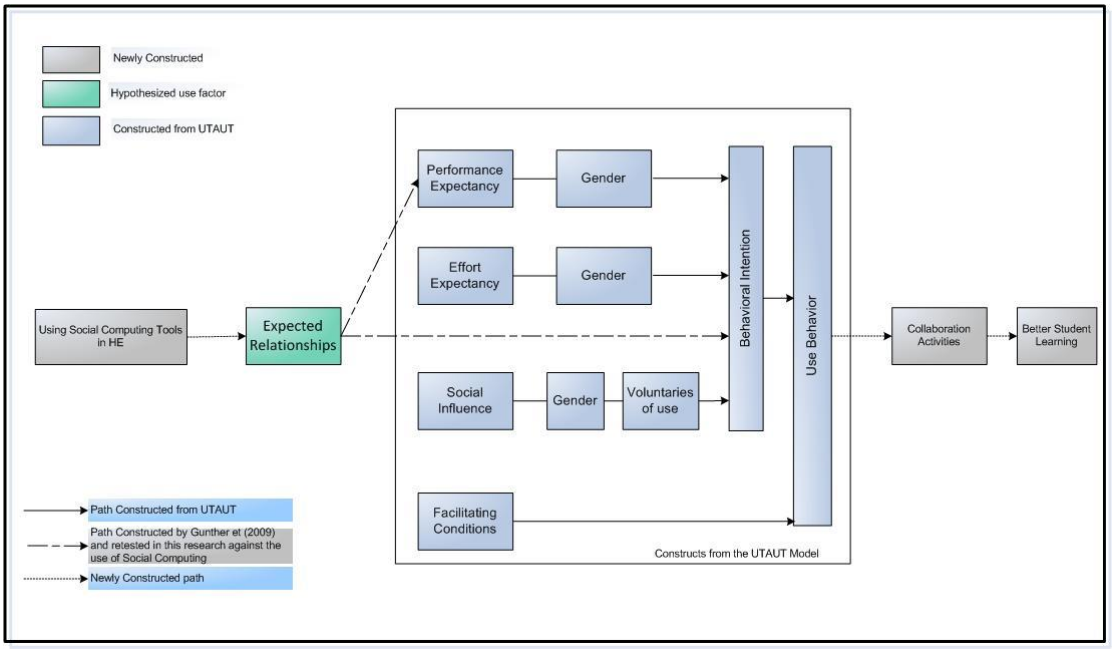

Figure 1-4: Expected Relationships factor

iii. **Communication Benefits:** The results from the questions about the expected communication benefits confirm a strong relationship across all samples between communication benefits and performance expectancy. The collected answers on questions 5 and 6 have an average mode of 4 across all samples (optimism levels of 74%, 76%, 79%, and 88% as shown in Table 1.5), which reflect user intention to use SC to communicate and get benefits from communication. A new path can be constructed between implementing SC in HE and the "Communication Benefits" factor, and between "Communication Benefits" and "Performance Expectancy" (positive relation) in the UTAUT model. Figure 1-5 illustrates this path.

The collected answers showed consistency between the surveyed samples when asked about the social influence of the gained communication benefits. The majority of them agreed on the positive relation between communication benefits and social influence. Figure 1-5 illustrates that path as well.

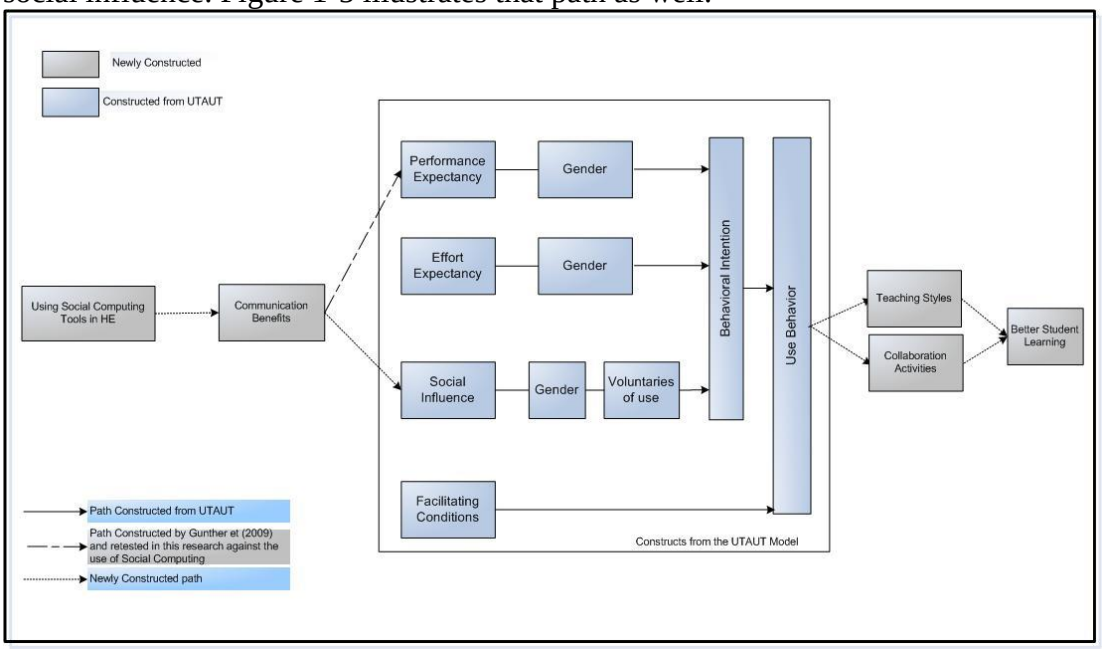

Figure 1-5: Communication benefits factor

iv. **Signal-to-Noise Ratio:** The important revelations from questions 7 and 8 had to reconsider the hypothesis about signal-to-noise ratio. The practical thought process from the reviewed experiences and literature seemed flawed from the results that have been received by surveys and data collected from interviews. Across all samples, participants believed that the signal-to-noise ratio will easily be greater than 1:1 when SC is used in HE. The average responses ranged from neutral to disagreement from the participants on using SC if the noise will be higher than the educational signal (optimism levels of 49%, 53%, 68%, 74%, 88%, 90%, 92%, and 94% as shown in Table 1.5). This result confirms the need to develop SC networks and services dedicated for education. This will help the user benefit from using SC in HE with a lower ratio of noise.

The collected results also show a positive relation between "Signal-to-Noise Ratio" and "Effort Expectancy." Hence, a new link path can be constructed between the SC updates and the signal-to-noise ratio, which is inversely linked to performance expectancy and positively linked to the effort expectancy.

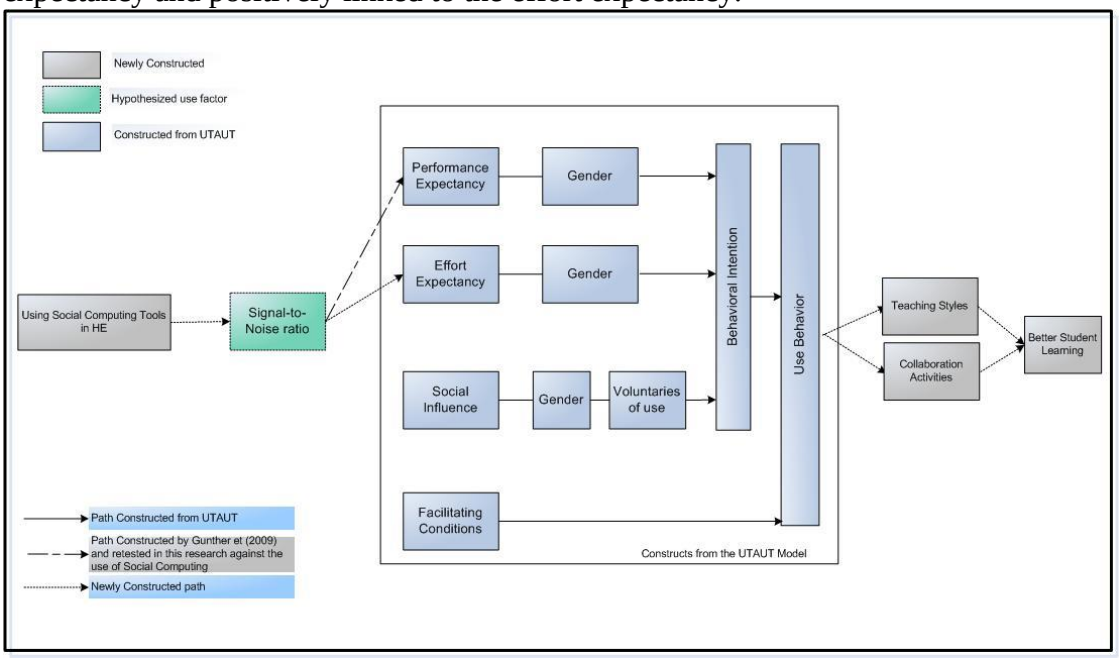

Figure 1-6: 'Signal-to-Noise Ratio' factor

v. **Codification Effort:** The responses to the codification effort questions show very strong agreement from most of the participants, which confirms the weak links with performance expectancy and behavioral intention, as hypothesized by the UTAUT model. Both questions for codification effort (questions 9 and 10) received modes of 5 (with optimism levels of 63%, 72%, 74%, 76%, 82%, 84%, and 88% as shown in Table 1.5). A new link path can be constructed between using SC in HE and the codification effort, which is inversely related to performance expectancy. In addition to the collected results, the logical sense confirms a positive relation between "Codification Effort" and "Effort Expectancy." These paths are shown in Figure 1-7.

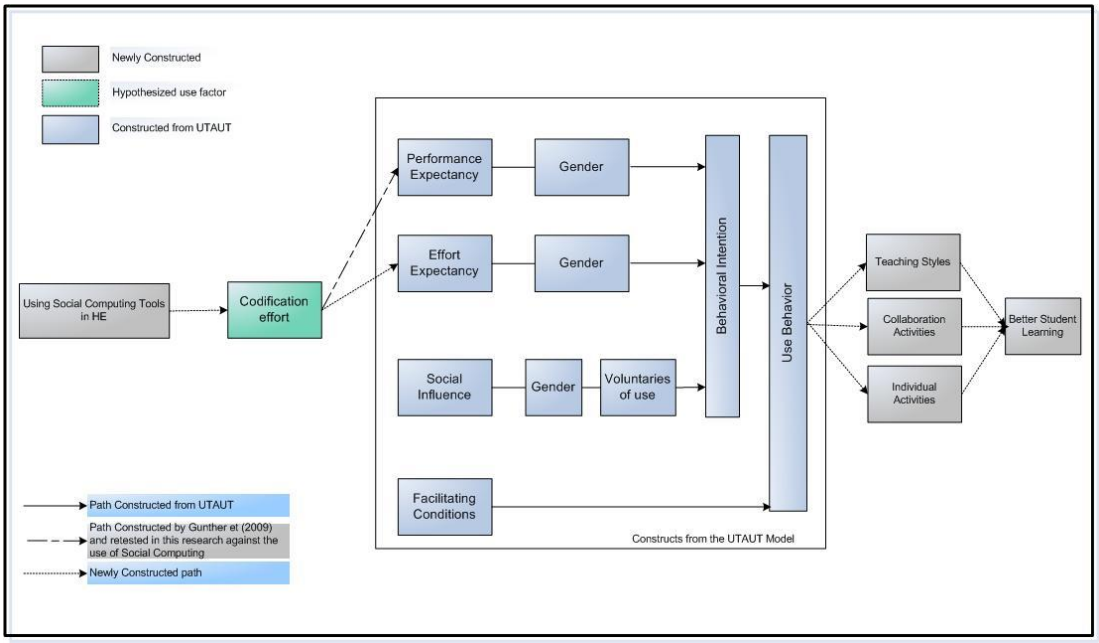

Figure 1-7: Codification effort factor

vi. **Privacy Concerns:** The answers to the privacy concerns questions consistently show very strong agreement from most participants, which confirms weak links with performance expectancy and behavioral intentions, as hypothesized by the UTAUT model. In the context of privacy concerns (questions 11 to 13), most participants were neutral about the idea that the cost of security is more than the benefits one receives from deploying SC in HE (optimism levels of 52%, 60%, 63%, 65%, 68%, 75%, 84%, 87%, 88%, 92%, and 94% as shown in Table 1.5). This could be due to a lack of actual implementation being done in academia. Another path can be developed based on Gunther's finding between using SC and privacy concerns, which is linked to behavioral intention as shown in Figure 1-8.

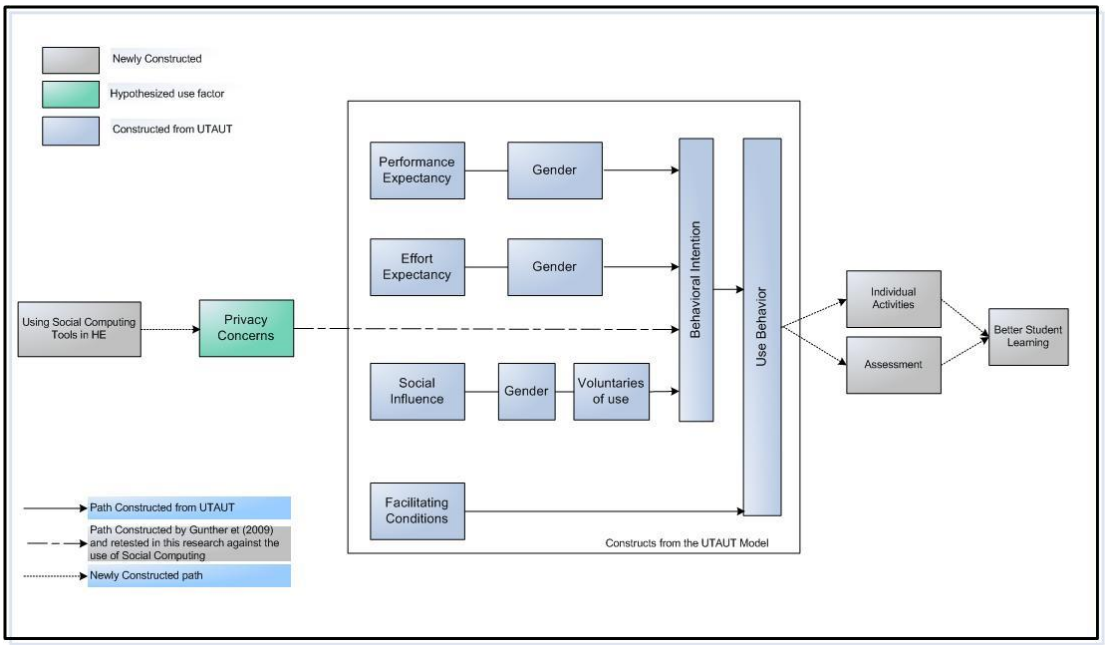

Figure 1-8: Privacy Concerns factor

vii. **Collaborative Norms:** For the collaborative norms factor, questions 14 and 15 received positive support from all samples. This is approval for the strong link with behavioral intentions. The participants showed strong agreement with the hypothesis (optimism levels of 71%, 76%, 79%, 80%, 82%, 83%, 90%, and 92% as shown in Table 1.5), which results in a strong link between collaborative norms and behavioral intention. The hypothesis is that using SC is linked to privacy concerns, which is linked to behavior intention with inverse relationships.

The users agreed that collaborative norms lead to social influence, which indicates a positive relation between both constructs. These relation links are illustrated in Figure 1-9.

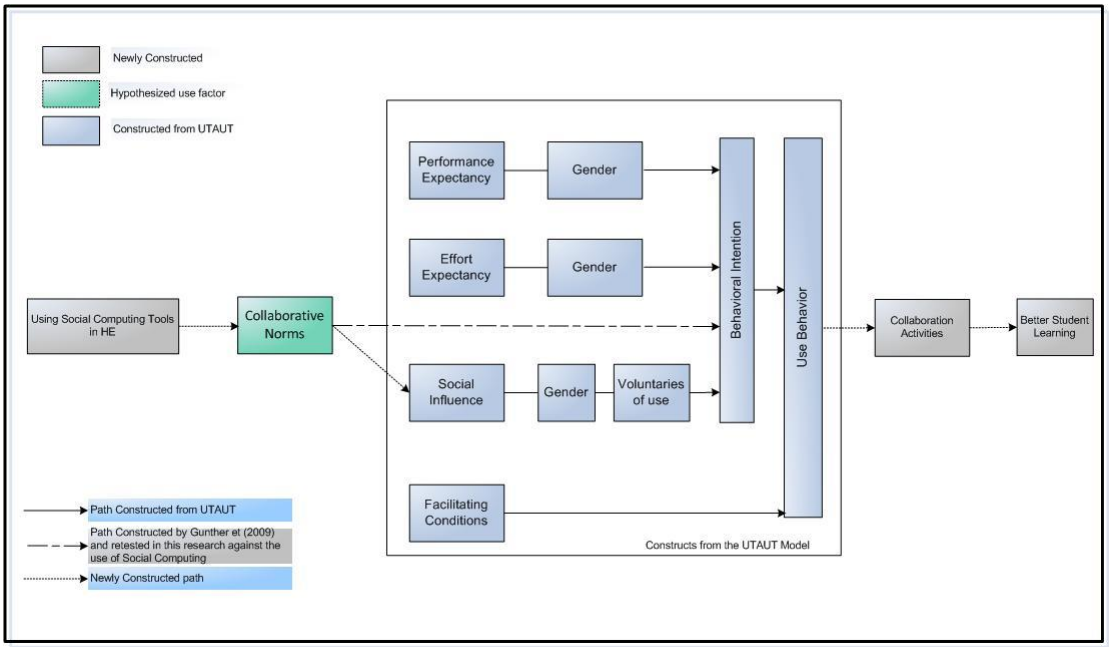

Figure 1-9: Collaborative Norms factor

viii. **Facilitating Conditions:** The last hypothesis is 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 17 and 18 went strongly against this hypothesis (optimism levels of 42%, 49%, 52%, 64%, 72%, 74%, 77%, 78%, and 92% as shown in Table 1.5). Based on the survey results, the participants felt that SC applications would be used extensively regardless of the IT infrastructure of the organization. The interview discussions included a clear tendency from the users to consider SC as a totally web-based technology; consequently, the users would be able to use it regardless of the university's or organization'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 minimum capabilities. Although the results were against the hypothesized link by UTAUT, they confirm the tendency of different stakeholders to use SC in HE. Hence, using SC can be directly linked to the "Facilitating Conditions" construct. Figure 1-10 illustrates this relation integrated with the UTAUT extension link (Gunther et al. (2009)) between facilitating conditions and use behavior and the proposed link between facilitating conditions and behavioral intention. An additional link was developed between facilitating conditions and effort expectancy based on the collected results.

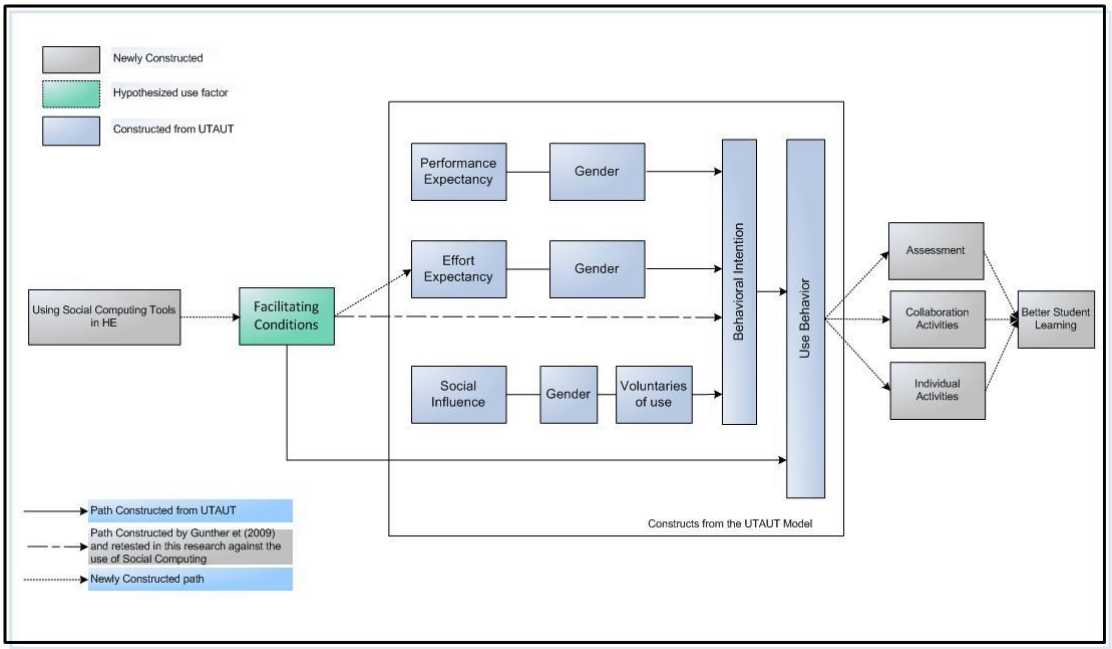

Figure 1-10: Facilitating Conditions factor

10.3. Framework Formulation (Putting it all together)

Table 1.6 summarizes the comparison between the results from analysis in this research and the links hypothesized by UTAUT and Gunther's (2009) expansion based on the results from the proposed surveys.

Table 1.6: Factors survey analysis-part2

Factors		Chosen Dependency	Hypothesized Link by the UTAUT model	Result from Analysis	Compare with UTAUT Hypothesis
3	**Reputation**	performance expectancy	strong link	strong link	same as hypothesis
4		behavioral intentions	strong link	strong link	same as hypothesis
5	**Expected Relationships**	performance expectancy	strong link	strong link	same as hypothesis
		behavioral intentions	strong link	strong link	same as hypothesis
6	**Communication Benefits**	performance expectancy	strong link	strong link	same as hypothesis
7	**Signal to Noise Ratio**	performance expectancy	***weak link***	***strong link***	***against hypothesis***
8					
9	**Codification Effort**	performance expectancy	weak link	weak link	same as hypothesis
10					
11	**Privacy Concerns**	behavioral intentions	weak link	weak link	same as hypothesis
12					
13					
14	**Collaborative Norms**	behavioral intentions	strong link	strong link	same as hypothesis
15					
16	**Facilitating Conditions**	behavioral intentions	strong link	strong link	same as hypothesis
17		behavioral intentions	***strong link***	***weak link***	***against hypothesis***
18					

By integrating each of the studied factors with performance expectancy, behavioral intention, and use behavior, a new model can be formulated to predict the reasons that should be considered when adopting SC tools in HE.

Putting all these factors together with the UTAUT constructs linked with the hypothesized links in this research and the hypothesized links by Gunther (2009), the following conceptual model can be presented to show the factors that affect the use of

SC in HE in the Gulf states. This model was developed based on the conducted studies in the case-study institutions. These institutions include samples of the present stakeholders of HE in the Gulf states. Figure 1-11 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 promoting learning levels.

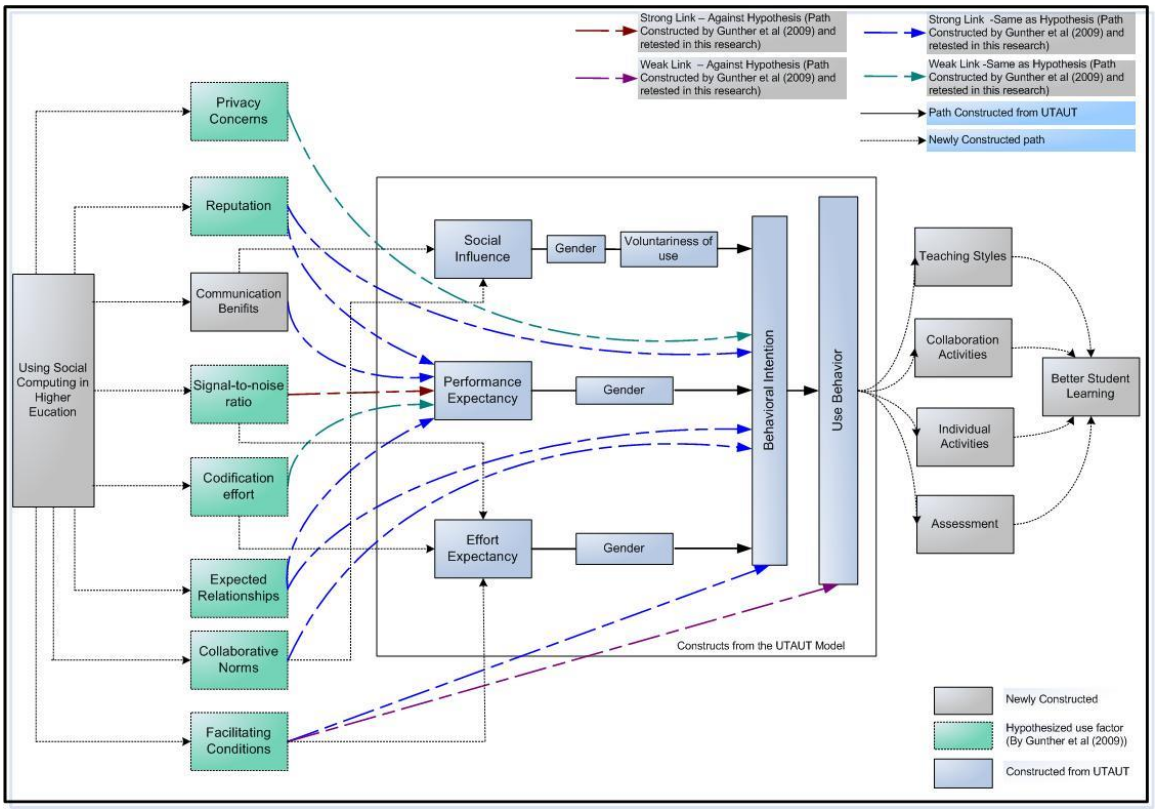

Figure 1-11: Conceptual Framework for implementing SC in HE in the Gulf States.

11. SIGNIFICANCE AND USAGE OF THE FRAMEWORK

This framework contributes to the body of knowledge by presenting a theoretical base for implementing SC in HE in the Gulf states. It also extends the research on technology acceptance by extending the UTAUT theory to include extra constructs related to the use of SC in HE. With regard to developing successful external validity and generalizing the research findings to the whole HE domain, the developed framework will also work also as an additional version of UTAUT specified for the use of the specified SC technologies. 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 future work will be also suggested for testing the proposed framework on other businesses (not just HE) to generalize the framework to any business in order to generate additional value.

The framework can be used as a theoretical base for developing new virtual learning environments (VLEs) that can support education with useful and effective

technology tools. This might affect the future of the VLEs since the demand for social technologies in business is increasing, and SC is emerging every day in a variety of business organizations.

12. FRAMEWORK VALIDATION

To validate the framework, a new system prototype will be developed to simulate new VLEs that focus on using a mix of SC tools to facilitate course delivery and learning activities. Group of usability experts are invited to do a heuristic evaluation of the developed system prototype. Then a group of the surveyed users will be contacted again to conduct usability testing and use the system to ensure it satisfies their needs and meets their expectations. The validation of the framework comes from validating the system prototype—in other words, the success of the system itself. On the other hand, when successfully validating the prototype, this validation will lead to validating the conceptual framework itself. Figure 1.12 shows the whole validation procedure.

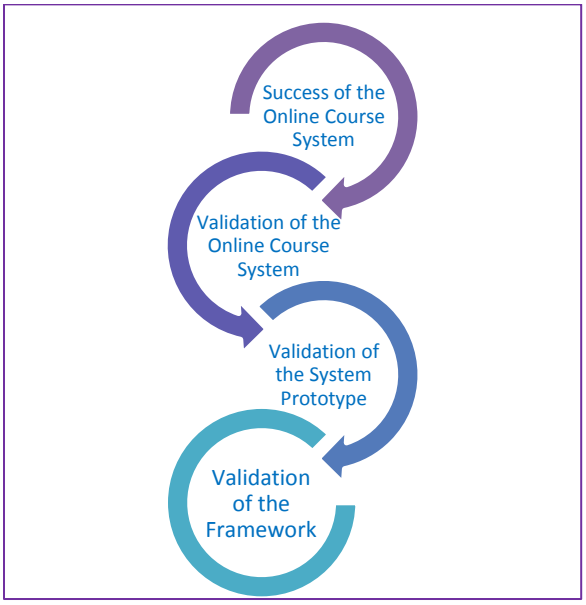

Fig 1.12: The validation procedure

The system prototype has been developed and validated using the validation procedure as illustrated in Figure 1.13.

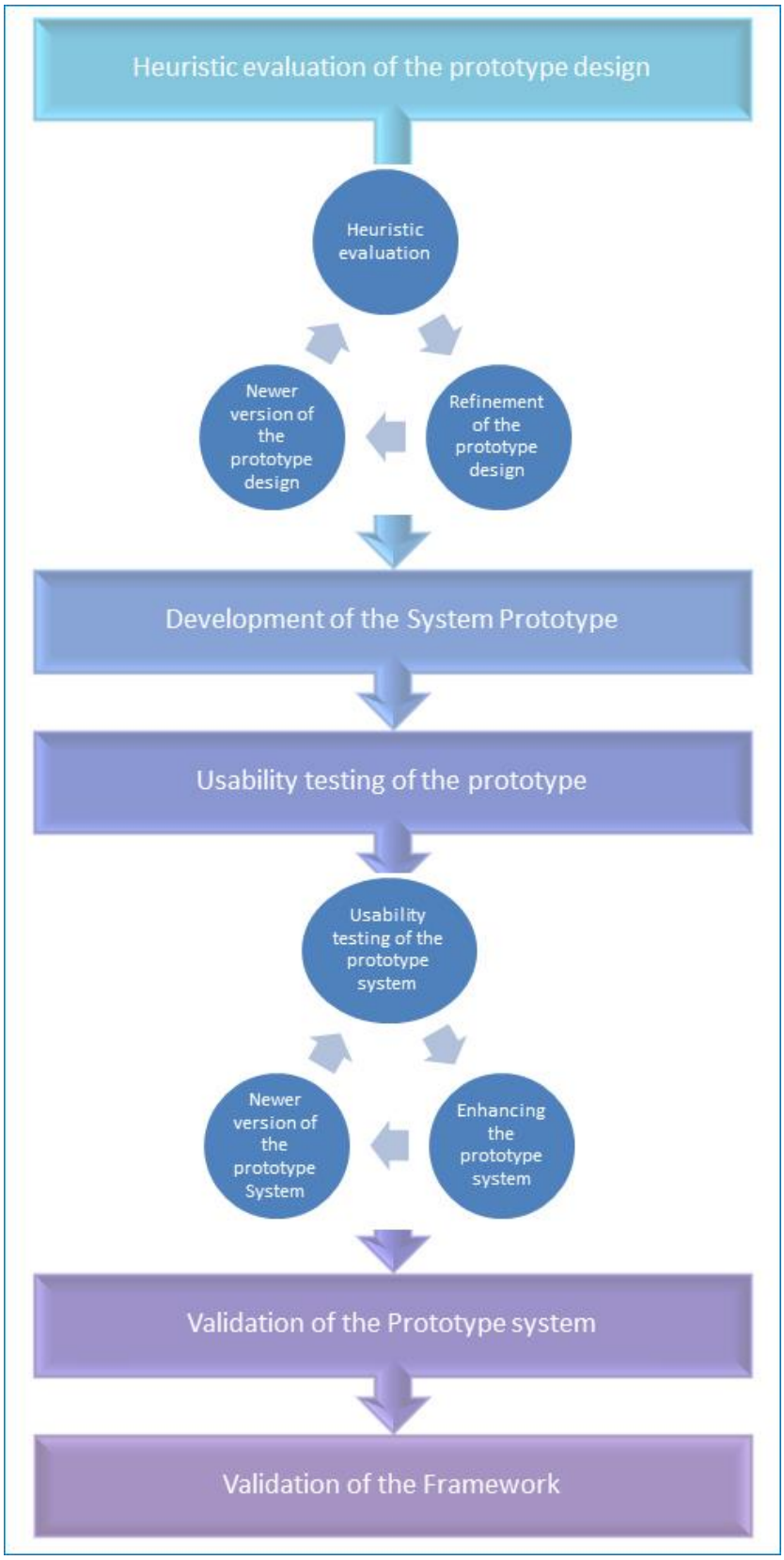

Figure 1.13: the prototype validation process

13. CONCLUSION

Implementing SC in HE in the Gulf states was studied to detect the drivers behind using it in HE to support teaching and learning processes. Sets of hypotheses were generated based on the existing theories of technology acceptance, and then data collection was conducted to confirm the proposed hypotheses. User acceptance of SC was studied through 8 factors that might affect the intention to use SC and use behavior: privacy concerns, reputation, communication benefits, signal-to-noise ratio, codification effort, expected relationships, collaborative norms, and facilitating conditions. The research methods included surveys and interviews. Based on the findings of these research methods, the use of SC in HE in the Gulf states is linked to all these factors, which means that it affects its relation with the behavior intention and consequently the use behavior. Inverse relationships between privacy concerns, signal-to-noise ratio, and codification effort on one side and behavioral intention on the other were concluded either through direct or indirect relationships. The rest of the factors had positive relationships with the behavioral intention. A new theoretical framework has been developed to collect all these relations together and prove the existence of a great opportunity to leverage teaching and learning processes in HE in the Gulf States through enhancing the level of student learning and engagement by implementing SC. The framework works as a theoretical base for the future research and development of VLE systems. To validate the prototype and instantiate the framework, a new system prototype has been developed and tested with a group of the survey participants.

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