

**FACTORS AFFECTING NURSES' MOTIVATION
AND CONFIDENCE FOR INCREASED SELF-
REGULATED AND COLLABORATIVE
LEARNING IN SECOND LIFE ENVIRONMENT**

AHMED ISAM KHALEEL

UNIVERSITI SAINS MALAYSIA

2017

**FACTORS AFFECTING NURSES' MOTIVATION
AND CONFIDENCE FOR INCREASED SELF-
REGULATED AND COLLABORATIVE
LEARNING IN SECOND LIFE ENVIRONMENT**

by

AHMED ISAM KHALEEL

**Thesis submitted in fulfilment of the requirements
for the degree of
Doctor of Philosophy**

December 2017

ACKNOWLEDGEMENT

I would like to express my deep and sincere gratitude to my supervisor, Assoc. Prof. Dr. Mona Masood. Her wide knowledge and her logical way of thinking have been of great value for me. Her understanding, encouragement and personal guidance have provided a good basis for the present thesis. It has been an honour to be her PhD. student. I appreciate all her contributions of time, and ideas, to make my research productive and stimulating. I am also thankful for the excellent example she has provided as a successful researcher.

I am also deeply grateful to Dr. Hosam Al-Samarraie for his assistant and constructive comments. He helped me through extensive discussions and interesting explorations of aspects related to my work.

I owe my loving thanks to my mother and my family. They have sacrificed a lot due to my research abroad. Without their encouragement and understanding it would have been impossible for me to finish this work.

TABLE OF CONTENTS

ACKNOWLEDGEMENT	ii
TABLE OF CONTENTS	iii
LIST OF TABLES	viii
LIST OF FIGURES	ix
ABSTRAK	xi
ABSTRACT	xiii
CHAPTER ONE - INTRODUCTION	1
1.1 Introduction	1
1.2 Background of the Study.....	3
1.3 Problem Statement	5
1.4 Research Objectives	7
1.5 Research Questions	7
1.6 Significance of the Study	8
1.7 Conceptual Model.....	9
1.8 Study Scope and Limitation	15
1.9 Operational Definitions	15
1.10 Summary of the Chapter	18
CHAPTER TWO - LITERATURE REVIEW	20
2.1 Introduction	20
2.2 Virtual Environments	20
2.3 Use of SL in Educational Context	21
2.4 Related Works on SL in Nurse Learning	24
2.5 Research Gap	26
2.6 SL Distinct Features.....	28
2.7 SL Content.....	30
2.7.1 Supporting role of tutors and students.....	31

2.8 Research Theories	32
2.8.1 Task technology fit (TTF) theory.....	32
2.8.2 Self-regulated learning model (SRL)	34
2.8.3 Simulation theory	36
2.9 Research Variables.....	37
2.9.1 Environment content design	37
2.9.2 Environment interactivity	39
2.9.3 Environment functionality	40
2.9.4 Confidence	41
2.9.5 Motivation.....	43
2.9.6 Self-regulated learning	44
2.9.7 Collaborative learning perspective.....	46
2.10 Summary of the Chapter	48
CHAPTER THREE - DESIGN OF SECOND LIFE ENVIRONMENT	49
3.1 Introduction	49
3.2 Instructional Design Model.....	51
3.2.1 Identify instructional goals	53
3.2.2 Conduct instructional analysis	54
3.2.3 Analyse learners and contexts.....	56
3.2.4 Write performance objectives	57
3.2.5 Develop assessment instruments.....	58
3.2.6 Develop instructional strategies	58
3.2.6(a) First scenario	64
3.2.6(b) Second scenario	67
3.2.7 Develop the environment.....	70
3.2.8 Design and conduct formative evaluation	70
3.2.8(a) One to one evaluation.....	71

3.2.9 Revising instruction material	71
3.2.10 Design and conduct summative evaluation	71
CHAPTER FOUR - RESEARCH METHODOLOGY	73
4.1 Introduction	73
4.2 Research Design	73
4.3 Instrument.....	75
4.3.1 Independent variables.....	75
4.3.2 Mediating variable.....	76
4.3.3 Dependent variable.....	76
4.4 Population and Sampling	79
4.4.1 Sample size	80
4.5 Validity and Reliability	81
4.5.1 Validity	81
4.5.2 Pilot study	82
4.6 Data Collection and Ethical Procedures.....	83
4.7 Statistical Analysis.....	84
4.7.1 Descriptive statistics.....	85
4.7.2 Partial least squares (PLS) technique	85
4.7.2(a) Advantages of PLS.....	86
4.7.2(b) Evaluation of the PLS model.....	87
4.8 Summary of the Chapter	89
CHAPTER FIVE - RESULTS	90
5.1 Introduction	90
5.2 Data Screening and Preliminary Analysis.....	90
5.2.1 Preliminary data analysis.....	91
5.2.1(a) Missing data.....	91
5.2.1(b) Outliers	92

5.2.1(c) Multivariate normality	95
5.2.1(d) Multicollinearity	95
5.3 Common Method Variance Analysis	96
5.4 Demographic Profile of the Respondents.....	97
5.5 Assessment of PLS-SEM Path Model Results	98
5.6 Assessment of Measurement Model	98
5.6.1 Reliability test	99
5.6.2 Component validity	100
5.6.2(a) Convergent validity	100
5.6.3 Discriminant validity	103
5.6.3(a) Cross loading assessment	103
5.6.3(b) Fornell-Larcker criterion	105
5.7 Structural Model Assessment	107
5.7.1 Predictive relevance Q^2	110
5.7.2 Effect size f^2	110
5.8 Summary of Results	113
CHAPTER SIX - DISCUSSION AND CONCLUSION.....	115
6.1 Introduction	115
6.2 Discussion	116
6.2.1 Effect of environment content design on student nurses' confidence.....	116
6.2.2 Effect of environment content design on student nurses' motivation.	117
6.2.3 Effect of environment interactivity on student nurses' confidence.	119
6.2.4 Effect of environment interactivity on student nurses' motivation.....	120
6.2.5 Effect of environment functionality on student nurses' confidence.	122
6.2.6 Effect of environment functionality on student nurses' motivation.....	123
6.2.7 Effect of student nurses' confidence on their self-regulated learning in SL.	124

6.2.8 Effect of student nurses' confidence on their collaborative learning in SL.	125
6.2.9 Effect of student nurses' motivation on their self-regulated learning in SL.	126
6.2.10 Effect of student nurses' motivation on their collaborative learning in SL.	127
6.3 Implications and Limitations.....	128
6.4 Future Works.....	130
6.5 Conclusion.....	130
REFERENCES	132
APPENDICES	

LIST OF TABLES

	Page
Table 2.1: Comparison between VR Systems and Virtual Worlds.	21
Table 4.1: Measurement of the Variables	78
Table 4.2: Reliability Analyses using the Cronbach’s Alpha Coefficient	83
Table 5.1: Demographic Characteristics of the Respondents (N=218)	97
Table 5.2: Summary of Descriptive Statistics (N=218).....	99
Table 5.3: Results Summary for the Measurement Model (N=218)	101
Table 5.4: Item Cross Loadings	103
Table 5.5: Correlations and Discriminant Validity (N=218)	105
Table 5.6: Hypotheses Testing Results (N=218).....	108
Table 5.7: Results of Testing Q ² for Predictive Relevance.....	110
Table 5.8: Results of Effect Size f ² and q ²	112

LIST OF FIGURES

	Page
Figure 1.1: Simulation theory by Gallese and Goldman (1998)	10
Figure 1.2: Conceptual model	15
Figure 2.1: The effects of the virtual environments of SL on the educational activities	31
Figure 2.2: TTF theory.....	33
Figure 2.3: Theoretical framework.....	37
Figure 2.4: Hypothesized model.....	47
Figure 3.1: The design of SL environment	50
Figure 3.2: Dick and Carey instructional design model (Dick & Carey, 2001).....	52
Figure 3.3: Task analysis of the first scenario “Heart failure problem”	55
Figure 3.4: Task analysis of the second scenario “Respiration problem”	56
Figure 3.5: The LifePak defibrillator machine	59
Figure 3.6: The scenario’s outcomes	59
Figure 3.7: Effects of each equipment as test and signals	60
Figure 3.8: The medical equipment tutor notes.....	60
Figure 3.9: Practicing the medical equipment.....	61
Figure 3.10: Medical bed of the emergency room	62
Figure 3.11: Actual scenario for the heart monitor	62
Figure 3.12: Heart monitor leads.....	63
Figure 3.13: The HUDs display window	63
Figure 3.14: The LifePak defibrillator machine	64
Figure 3.15: Crash cart for medical object.....	65
Figure 3.16: Patient’s vital signs	65
Figure 3.17: The heart monitor.....	66
Figure 3.18: Heart monitor responding.....	66

Figure 3.19: The defibrillator machine options window	67
Figure 3.20: Charge power options window	67
Figure 3.21: Shock results options window	67
Figure 3.22: The anaesthesia machine's options window	68
Figure 3.23: The anaesthesia machine	68
Figure 3.24: Ventilator settings window.....	69
Figure 3.25: Setting rate window	69
Figure 3.26: Setting volume window.....	69
Figure 3.27: Text and conversation window	70
Figure 4.1: Research procedure.....	74
Figure 5.1: BOXPLOT for the six items of "Environment content design"	93
Figure 5.2: BOXPLOT for the eight items of "Environment interactivity"	93
Figure 5.3: BOXPLOT for the seven items of "Environment functionality"	94
Figure 5.4: Measurement model assessment.....	106
Figure 5.5: Results of bootstrapping (t-values).....	109

**FAKTOR MEMPENGARUHI MOTIVASI DAN KEYAKINAN JURURAWAT
BAGI PENINGKATAN PENGATURAN KENDIRI DAN PEMBELAJARAN
KOLABORATIF DALAM PERSEKITARAN *SECOND LIFE***

ABSTRAK

Penekanan semasa ke atas pendidikan staf atau pelajar kejururawatan memerlukan lebih penggunaan alatan interaktif bagi menilai pembelajaran individu. Oleh itu, kajian ini dilaksanakan untuk mengenal pasti potensi penggunaan *Second Life* (SL) bagi memberi pelajar kejururawatan keyakinan dan motivasi serta kesan terhadap pengaturan diri dan pembangunan pembelajaran secara kolaboratif. Bagi membina persekitaran SL, model reka bentuk pengajaran Dick dan Carey digunakan bagi mereka bentuk dua senario pembelajaran LifePak Defibrillator dan mesin anestesia. Pendekatan penyelidikan kuantitatif dengan menggunakan kaedah soal selidik telah dijalankan dalam kajian ini. Satu model yang sesuai bagi Kuasa Dua Terkecil Separa (PLS) – teknik Pemodelan Persamaan Struktur (SEM) ke atas 218 dihasilkan bagi menganggar kesan terus elemen persekitaran dari segi reka bentuk kandungan (ECD), interaktiviti (EI), dan kefungisian (EF) ke atas tingkah laku pelajar kejururawatan dari segi motivasi dan keyakinan. Sebagai tambahan, kesan terus tingkah laku pelajar kejururawatan terhadap pembangunan pengaturan diri dan pembelajaran kolaboratif turut dikaji. Hasil daripada 10 hipotesis yang diperoleh ke atas kesan signifikan kecuali bagi elemen reka bentuk kandungan persekitaran ($\beta = -0.003$, nilai $t = 0.041$, nilai $p > .05$) and kefungisian persekitaran ($\beta = 0.133$, nilai $t = 1.924$, nilai $p > .05$) ke atas keyakinan jururawat. Bagi penilaian kualiti model; Q^2 untuk model laluan semasa menunjukkan perkaitan ramalan bagi binaan endogen terpilih (motivasi dan keyakinan) dengan nilai atas sifar. Hasil kajian boleh

digunakan bagi meluaskan pemahaman semasa teori simulasi dengan menegaskan bahawa SL boleh menilai pelajar kejururawatan tentang hal berkaitan klinikal melalui pengawalan karakter (avatar) seperti yang dijangkakan memberi kurang tekanan dan kebimbangan yang menjadi mempengaruhi keyakinan seseorang.

**FACTORS AFFECTING NURSES' MOTIVATION AND CONFIDENCE FOR
INCREASED SELF-REGULATED AND COLLABORATIVE LEARNING IN
SECOND LIFE ENVIRONMENT**

ABSTRACT

The current emphasis on nursing staff/student education have brought the needs for applying more interactive tools to assess individuals' learning. Therefore, this study was conducted to investigate the potential use of Second Life (SL) to facilitate student nurses' confidence and motivation, as well as its impact on their self-regulated and collaborative learning development. To build the SL environment, instructional design model of Dick and Carey was used to design the two learning scenarios of LifePak Defibrillator and anaesthesia machine. A quantitative research approach employing the survey method was used in this study. A model fit for Partial Least Squares (PLS) – Structural Equation Modeling (SEM) technique on 218 participants was produced to estimate the direct effect of environmental elements in terms of environment content design (ECD), environment interactivity (EI), and environment functionality (EF) on student nurses' behaviour in terms of motivation and confidence. In addition, the direct effect of student nurses' behaviour on the development of their self-regulated and collaborative learning were also examined. The results from 10 hypotheses yielded on significant effects except for the elements of environment content design ($\beta = -0.003$, t value = 0.041, p -value >.05) on student nurses' confidence. For the assessment of model quality; Q^2 for the current path model shows a predictive relevance for the selected endogenous constructs (motivation and confidence) with values above zero. The finding of this study can be used to extend the current understanding of simulation theory by asserting that SL

can assess student nurses to learn about clinical related matters through the control of teleported characters (avatars) in which less stress and anxiety are expected which are the main driver of one's confidence.

CHAPTER ONE

INTRODUCTION

This chapter addresses the need for investigating the potential use of Second Life (SL) to facilitate student nurses learning. It highlights the current problems and issues faced by student nurses associated with the current curriculum and adoption of technology in order to increase their confidence and motivation. Research objectives and questions were addressed along with the research conceptual model. Finally, the definition of the study terms was provided.

1.1 Introduction

With the current movement towards using advanced technology in nurse education, educational and healthcare institutions have started to consider examining the potential of various learning and teaching strategies in order to provide the ultimate learning experience. This include facilitating student nurses' reflection and motivation to learn and explore aspects related to their learning.

The use of SL was recognized for its effectiveness and feasibility to help in learning complex topics. SL consists of information presented in an interactive way to help learners around the world to communicate and share their experience with each other (Jarmon, Traphagan, Mayrath, & Trivedi, 2009). It was first found and constructed by Linden Lab's Second Life which is considered to be the most popular virtual world platform in use today, with an emphasis on social interaction (Jennings & Collins, 2007). The review of the literature in different contexts revealed a high

potential of this technology in aiding individuals' understanding of certain learning topics by providing meaningful social interactions and develop team work skills in a virtual space (Haycock & Kemp, 2008). This led the researcher in the present study to investigate the current issues associated with student nurses when learning online. It explored how using SL can facilitate individuals' positive behaviour to better understand and share resources in an online environment. For example, Cant and Cooper (2010) reported on the needs for developing competence in clinical reasoning through promoting confidence when the nurse students learn to apply knowledge and skills to make a clinical judgment. In addition, the development of safe nursing practice in entry-level nursing students usually requires careful consideration from nurse educators. This is properly because the paucity of data supporting high-fidelity patient simulation effectiveness has the potential to promote the development of the relationship between simulation and student self-confidence (Blum, Borglund, & Parcells, 2010). Yet, the need for further examination of using advanced technologies into nurse education necessary to aid the self-confidence and practices is important. According to Tuten (2009), SL may provide an opportunity for student nurses by enabling them to build the necessary confidence needed to participate in a discussion. This involve developing student nurses' ability, motivation, and attitude to learn, to practice skills, to try new ideas, and to learn from their mistakes. Furthermore, learners can simply engage with any learning tasks provided through SL from anywhere in the world (Boulos, Hetherington, & Wheeler, 2007). SL can also facilitate the development of learners' cognitive related aspects and the behaviour to learn the new concepts and materials. This is simulated by incorporating learning and teaching principles into the learning activity; where learning involves structure, collaboration between team members and some form of motivation, regardless of the

participants' location (Kirriemuir, 2008). Therefore, the researcher in this study was motivated to explore the potential use of SL in increasing student nurses' self-regulated and collaborative learning.

1.2 Background of the Study

The current emphasis on nursing education in general have brought the needs for applying more interactive tools to assess individuals' learning. This is known as a topic of utmost interest in every setting in which the goal is mainly to acquire different learning skills. With the current development in the nurse education practices, it become essential that current technologies can potentially provide a meaningful environment to further empower these practices (Melnyk & Fineout-Overholt, 2010). It depends on whether nurses have learned the essential concepts and have acquired the up-to-date knowledge and skills needed to competently and confidently provide care to the consumer in different environmental settings. Mary Bowen, Lyons, and Young (2000) underline the various challenges that would face the teaching and learning process of nurses to gain new skills. Therefore, nurses knowledge about nursing practices must be upgraded from time to time (Zoraini Wati, Nafsiah, & Phua, 2003). This fact was driven from the educational background of nurses in different health care sectors. One problem arises when there is a shortage of time that is required for nurses to attend training programmes (Pasila, Elo, & Kääriäinen, 2017). On the other hand, a number of researchers (e.g., Anderson et al., 2016; Chong, Sellick, Francis, & Abdullah, 2011; Connor, Dwyer, & Oliveira, 2016; Kang, Chiu, Lin, & Chang, 2016) highlights the current challenges faced by the

student nurses to participate in collaborative learning activities. This study summarized the current learning and training problems as follows:

- i) Lack of time to learn due to rapid patient discharge from care can discourage and frustrate the nurses to attend the training programmes.
- ii) The lack for a suitable learning environment.
- iii) The degree of behavioural changes of nurses to learn is needed to overcome the current issues in nurse learning.
- iv) Lack of support and ongoing positive cooperation between nurses that all leads to block the potential for learning.
- v) Lack of willingness to take responsibility due to the limitation in nurses' confidence and control.

Meanwhile, the current learning and teaching tools may not necessarily ensure the development of basic navigation, communication, and information sharing skills among student nurses (Davis, Hercelinskyj, & Jackson, 2016). This is because current learning tools such as Moodle, social network sites, and other synchronized collaborative environments may not apply discipline-specific care planning process to the collaboration practices (Blindauer, Tracy, Hazelton, & Forys, 2016), which would influence individual's participation in group work activities and discussion. The researcher therefore considered the potential of using SL to overcome these challenges, particularly by facilitating student nurses sharing of the learning content in a clinical nursing context. In addition, Kuiper and Pesut (2004) stated that not only the collaborative activities could facilitate student nurses learning, but also help them to develop their self-regulated learning that act as "a theoretical structure that

explains how clinical reasoning skills can be acquired through attention to reflective thinking and critical thinking skill acquisition” (Kuiper & Pesut, 2004, p1). It is also assumed that the use of SL in nursing education may offer an alternative tool for student nurses by providing an exciting and accessible form of learning environment for nurse education that can potentially develop their sense of confidence and motivation. It is also evident from the literature that students’ levels of motivation may influence their effort and the approaches they take to learning and applying new concept (Robb, 2016). Hence, it was further believed that such experience can help increase student nurses self-regulated and collaborative learning in an online environment.

1.3 Problem Statement

With the rapid change in the system of health care, nurses will find themselves in a progressively more challenging and highly in composite position (Bastable, 2003; Morilla, Sans, Casasa, & Giménez, 2017; Stokke, 2016). The lack of current teaching and learning methods to convey the complex nursing procedures have affected and continue to affect student nurses’ responsibilities in practice (Bastable & Gramet, 2010). Such lack was annotated to be associated with the development of student nurses’ self-regulated and collaborative learning in a context specific condition. For example, the literature showed that students with a low degree of self-regulated skills can hardly adapt to a challenging task, adjust appropriately to the learning environment, and process information (Salamonson et al., 2016). Conte, Jirwe, Scheja, and Hjelmqvist (2016) also considered nurses’ low participation in a collaborative learning activity to be attributed to the current medium and facilities

provided to them to share resources and knowledge. This is why student nurse need to be equipped with a spectrum of confidence (Lundberg, 2008) and motivation (Toode, Routasalo, & Suominen, 2011) that will assist them in fulfilling their roles as effective health care providers. In addition, the current learning and teaching practices of nursing are needed to be changed from task oriented to role oriented (Pasila et al., 2017; San Jose, 2017). As such, there is an urgent need for nurses to be upgraded in their learning practices that allow them to share and learn effectively in an interactive learning context like SL. Freeman, Voignier, and Scott (2002) addressed their expectation towards the significance of using dynamic and proactively responsive tools to fulfill these changes. Constantly, the characteristics of the current nursing curriculum must include the promotion of life-long learning, theory that matches the practice, and a focus on outcomes (Delany et al., 2016; Zoraini Wati et al., 2003). SL therefore could be used as a learning environment in order to increase the nurse learning skills to effectively collaborate in learning related tasks. However, there is a little evidence about the effectiveness in developing individuals' regulated learning and participation in collaboration practices (Moore, Prentice, & Salfi, 2017; Pfaff, Baxter, Jack, & Ploeg, 2014). This is mostly driven by the lack of knowledge about the role of SL in facilitating student nurses' motivation and confidence to promote self-regulated and collaborative learning activities. In order to gain better understanding, the researcher interpret this as the changes in behaviour explained by the principles of environmental/ecological influences, perception, memory, cognitive development, and explanation that can facilitate motivation and confidence to learn in SL.

1.4 Research Objectives

The objectives of the study are:

- 1) To investigate the effects of SL on student nurses' confidence and motivation.
 - a. Investigate the effects of environmental content design, interactivity, and functionality on student nurses' confidence in the SL environment.
 - b. Investigate the effects of environmental content design, interactivity, and functionality on student nurses' motivation in the SL environment.
- 2) To investigate the effects of student nurses' confidence on their self-regulated and collaborative learning in the SL environment.
- 3) To investigate the effects of student nurses' motivation on their self-regulated and collaborative learning in the SL environment.

1.5 Research Questions

This research aims at answering the following:

- 1) What are the effects of SL on student nurses' confidence and motivation?
 - a. What are the effects of environmental content design, interactivity, and functionality on student nurses' confidence in the SL environment?
 - b. What are the effects of environmental content design, interactivity, and functionality on student nurses' motivation in the SL environment?
- 2) What are the effects of student nurses' confidence in the SL environment on their self-regulated and collaborative learning?

- 3) What are the effects of student nurses' motivation in the SL environment on their self-regulated and collaborative learning?

1.6 Significance of the Study

The significance of using SL in nurse education is considered to be one of the most important aspects that can be used to introduce learning opportunity that are suitable to the needs of nurses. Identifying nurses' behavioural related aspects towards the use of SL would increase their willingness to share their experiences and listen to those of their peers due to the expected knowledge and skills that nurses may gain from using SL. This study would also carry the cognitive aspect of nurses to learn, which encourage them to increase their confidence and level of motivation in the SL environment.

Identifying the impact of SL can help assess student nurses to learn effectively with peer or individually. Therefore, examining the effectiveness of using SL among student nurses would:

- i) Overcome the early stated challenges faced by nurses in terms of shortage of time required for them to attend face to face training programmes. This is due to the flexibility of SL that can be accessed anytime and from anywhere.
- ii) Increase the student nurses' confidence and motivation to learn individually and with groups.

1.7 Conceptual Model

In this work, the Simulation theory by Gallese and Goldman (1998) was used to explain the potential of using SL in nurse education. It concerns about how an individual can adopt the circumstances of an environment and then uses one's own mental apparatus to generate mental states and decisions (see Figure 1.1). This process is usually represented as feeding pretend inputs into one's own decision-making processes (Gordon, 1992). Based on this, it was assumed that when student nurses use SL, they will be more likely to reflect and process information adequately. For example, student nurses can be stimulated by the SL antecedents such as content design, interactivity elements (i.g., chatting, free navigation, and customization of the space), and functionalities. These, as a result, will drive student nurses' decision-making process by gaining the required control for completing the task. In addition, other studies like (Mosler, Schwarz, Ammann, & Gutscher, 2001) who stated that when an individual perceive the relevance of an environment, the individual's motivation to process increases. This is also found to help build student nurses confidence to apply the learned concept in virtual space (Hope, Garside, & Prescott, 2011).

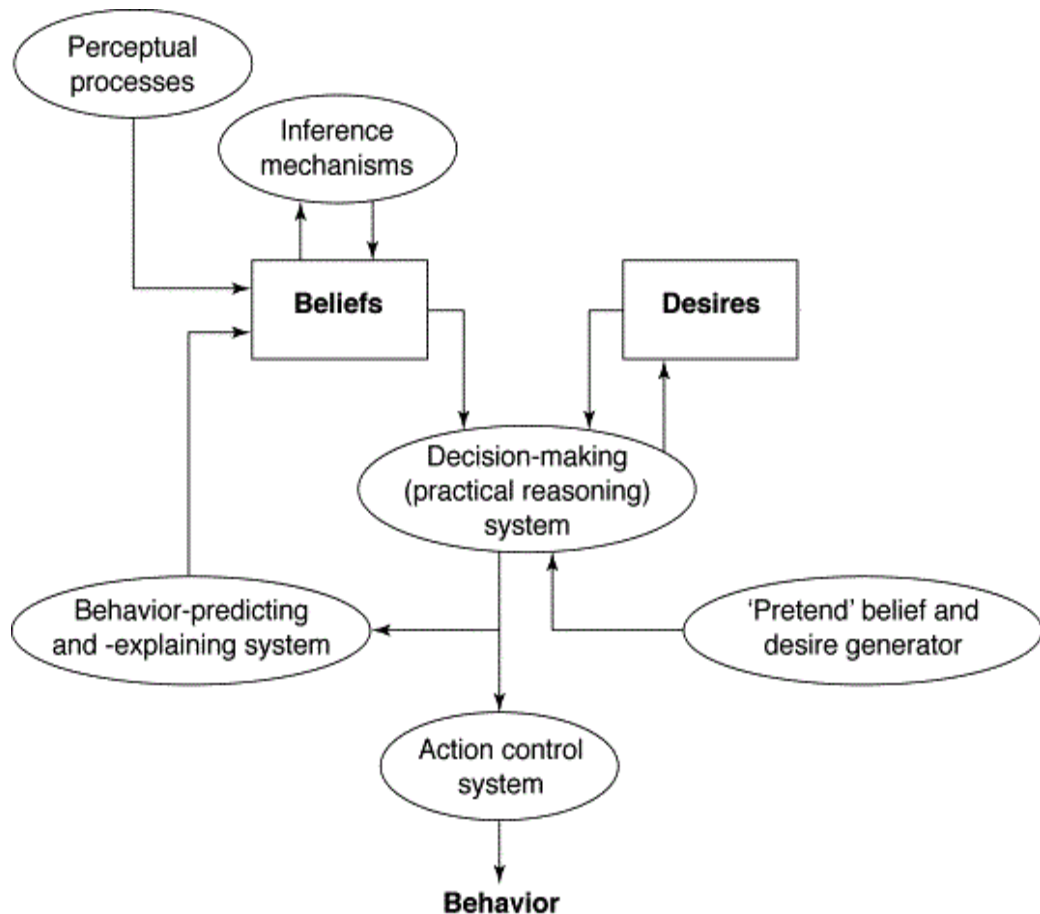


Figure 1.1: Simulation theory by Gallese and Goldman (1998)

Interest in the functionalities of the environment as a source of rich and meaningful interactivity can help individual to better process the learning materials. There appears to be many advantages to seriously considering environmental characteristics as a dominant goal for these types of learning environments (Sharma & Vatta, 2013). The association between the SL factors such as functionalities and interactivity can be driven as a way for enriching the constructivist concept of a microworld with simulation characteristics. SL content design seems to offer important implications to the overall interactivity of a person when learning about certain topics. This discussion has been rooted in instructional technology; hence, it can be said that SL can primarily support the student nurses' interactivity with the materials and the task. Although SL may be designed as an expandable simplest case

of a system that aims at engaging students in active learning experience, this, in and of itself, requires other environmental elements in order to satisfy the requirements of self-regulated learning. The learner may not be interested in choosing to initially participate in the activity nor may choose to persist in the activity for extended periods of time at a meaningful level (Harley, Trevors, & Azevedo, 2013). Thus, it is assumed that the content design of the SL environment can potentially play a role in boosting the interactivity of a learner. On the other hand, the study of the relation between interactions and academic performance in SL supported courses is the object of study of effective learning (Stephens, Hamedani, & Destin, 2014). Agudo-Peregrina, Iglesias-Pradas, Conde-González, and Hernández-García (2014) stated that the key to the efficacy of collaborative learning typically correspond to the interactivity of the environment which increase the effectiveness of collaborative learning. Hence, lack of interactivity in the design of an environment may properly limit the sharing and learning of members in a group. Mega, Ronconi, and De Beni (2014) linked interactivity to the functionality of the system to carry out the interactivity elements for individual to process a learning activity. But building interactivity into SL environments that includes support for collaborative learning can typically contribute to one's learning experience by increasing the motivational values preserved towards the task. The visual and interactive features providing better presentation format and enabling learner control and feedback are the primary factors employed to explain enhanced learner motivation (Dias & Diniz, 2014).

In this study, it is assumed that student nurses using the highly interactive mode may experience better motivation and confidence. Meanwhile, web functionality is related to various aspects of online activities with regard to user

friendly interface, information presentation, classification, navigation, artistic design, and personalization (Lehmann, Hähnlein, & Ifenthaler, 2014). This also include the coordination of content-related attributes, such as the quality of information marked by expertise and trustworthiness labels, operate as heuristic cues for users' perceptions, ultimately guiding their decision-making process as a more positive and interactive one (Pellas, 2014). However, various features that might facilitate user-to-user interaction (e.g., user profile, live chat rooms, feedback cues on discussion forums, etc.) were missing in Pellas' study. Thus, the researcher included these elements within SL to promote the user-to-user interaction. Nevertheless there was little option for personalization/customization, multimedia inclusion, and content immediacy in the sites analyzed for the study. Therefore, this study aims at exploring how the SL content design, interactivity, and functionality can promote student nurses' confidence and motivation to process better self-regulation behavior.

Several previous studies (Adolphs, 2003; Leroy & Ramanantsoa, 1997; Rayner & Riding, 1997) addressed the various aspects of individual's behaviour towards a learning task based on the environmental settings. They reported that these aspects help to address the influence of technologies used in the learning process on learners' cognitive thinking which is known as the individual's self-regulated learning (SRL). SRL helps to increase the motivation level of learners and as a result, their willingness to share and collaborate with others during the learning process. This fact was clearly addressed by Zimmerman (2002) who claimed that the use of advance learning tools promote confidence and self-motivation to learn, in which it is associated with the learner's self-regulatory processes.

In addition, Zimmerman and Bandura (1994) added that students' use of self-regulatory processes is distinctive from but correlated with general measures of control, such as verbal ability to master learning task.

Wolters (2003) added that learning is fraught with potential obstacles that may interfere with learners' goals or motivation, and so those who can "maintain their motivation and keep themselves on-task in the face of competing demands and attractions should learn better than students who are less skilled at regulating their motivation" (Dörnyei, 2005) p. 91).

From this, we reached an understanding that the use of SL can drive student nurses' motivation and confidence in order to process a better self-regulated learning which in turn can also enable them to learn with others. This phenomenon is supported by the Task Technology Fit (TTF) theory by Goodhue and Thompson (1995). The TTF consists of explaining how certain task and technology characteristics can potentially influence individuals' behavioural outcome that depends jointly on motivation (known as intention) and learning ability (known as monitoring) which is explained by Klein and Keller (1990) as the level of confidence to complete a task.

Bastable (2003, p.45) acknowledged that "behaviourists recommend either altering the stimulus conditions in the environment or changing what happens after a response occurs" which also depends on the motivation to reduce some drive-in terms of learning and changing. On the cognitive aspect, this study consists of the extent to which information can be processed is indicative of the level at which the

learner is capable of learning. This led the researcher to consider the model of self-regulated learning by Schmitz and Wiese (2006) that consists of the nurse regulation to learn in which it is driven by the nurse's level of motivation and confidence to learn effectively individually and in peers.

The researcher also put into considerations the possible impact of SL on nurses' regulated learning to learn and share with others. To explain this, the researcher relied on the main premises of the simulation theory which proposed that one represents the mental activities and processes of others by mental simulation, i.e., by generating similar activities and processes in oneself. For example, one represents another person to do the task by making inferences from the same premises of oneself. Here, it is assumed that when nurses use SL, they can work through their avatars to learn and work in peers within the same environment. Moreover, the anticipation and comprehension of intelligently controlled behaviour are also the main component of the simulation theory by predicting the underlying inferential and decision-making processes. Researchers (for example, Cacciabue, 2011; Schneider & Chein, 2003) have claimed that the same models that provide an account of practical reasoning can efficiently be adapted to perform mental state attribution. Therefore, the researcher used this to furnish the conceptual model shown in Figure 1.2.

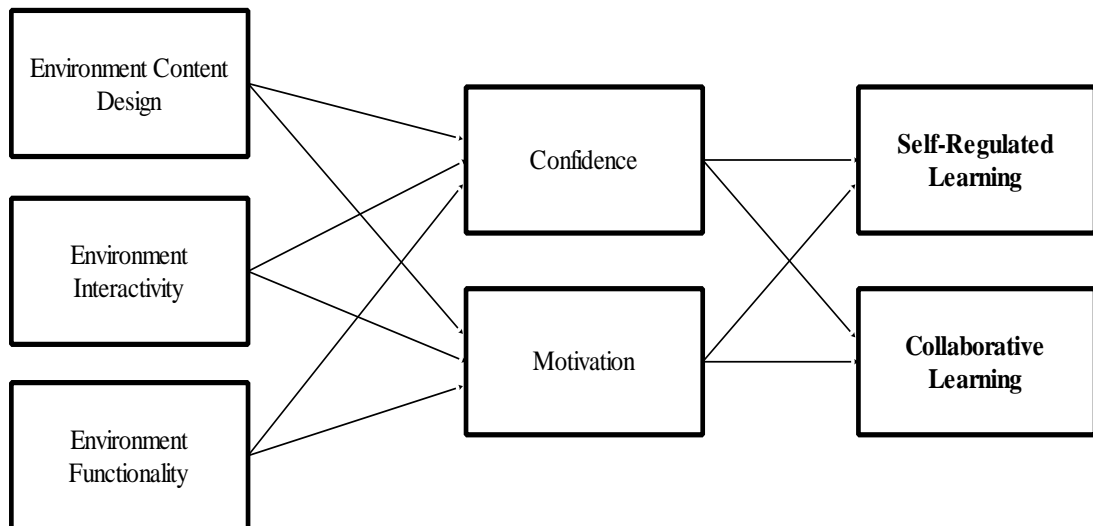


Figure 1.2: Conceptual model

1.8 Study Scope and Limitation

The scope of this study was to study the effectiveness of SL in developing student nurses self-regulated learning and collaborative learning. It consists of investigating the impact of SL certain environmental antecedents on student nurses' confidence and motivation. The subjects to which the researcher designed the SL environment were student nurses with valid account in the SL only. In addition, the design was limited to certain nursing cases that requires using complex equipment on patient in the SL space. The learning activities of student nurses in SL were limited to sharing of resources and participating in collaborative activities through which some sequential instructions were given.

1.9 Operational Definitions

The operational definitions help provide a clear description of the factors and elements used in the present study to construct the research framework, such as:

- **Second Life (SL):** Is a part of the VLE designed to fulfill various learning and training purposes (Minocha & Reeves, 2010). SL is also known as a 3D Virtual World (VW) and Virtual Reality (VR) where end-users can communicate, socialize and learn using the available learning and teaching tools such as voice and text chat (Varvello, Ferrari, Biersack, & Diot, 2011). SL for this study represents an environment designed to facilitate nurses learning via personal avatar. Therefore, SL is designed to provide a role oriented context by enabling nurse students to collaboratively engage in effective learning scenarios.
- **Environment content design:** It explains how the environment shapes the learner and, in turn, how learning environment influences the learner (Cagiltay, Aydin, Aydin, Kara, & Alexandru, 2011). The content design consists of the elements of SL which is reflected in the design components shown in Appendix A. Environment content design in this study was measured by using six questions adapted from (Lee, Yoon, & Lee, 2009).
- **Environment interactivity:** The terms interaction and interactive are now ubiquitous, and their association with multimedia environments has led to the unrealistic expectation that all interactive technologies guarantee instructional interactions between the nurse students and the environment or software (Ingerham, 2012; Sedig & Parsons, 2012). In this study, the level of interaction between student nurses and SL is to be measured, means that interaction was viewed, not as an attribute of the technology, but as an outcome of communication dynamics resulting from planned instruction in the SL. Environment interactivity in this study was measured by using three questions adapted from (Liaw, 2008) and five other questions were adapted from Lewis (1995).

- **Environment functionality:** Is the feature of the system that dynamically configured to create the solution that accommodates the needs of every individual space (Lee et al., 2009; Pituch & Lee, 2006). In this study, the system functionality refers to the SL ability to change and process nurse orders based on the assigned roles in which it may take a prime role like active nurse or secondary role like observer. It also refers to the ability of SL to provide flexible access to instructional materials via various types of media such as simulation, audio, and text. Environment functionality in this study was measured by using seven questions adapted from (Poelmans, Wessa, Milis, Bloemen, & Doom, 2008).
- **Confidence:** Is the belief in oneself and abilities, it describes an internal state made up of what individual think and feel about oneself. This state is changeable according to the situation the user is currently in associated with the response to other events in the environment. In this study, confidence refers to the nurse ability to learn in SL. It also refers to the nurses ability to perform clinical skills in the clinical setting (Pike & O'Donnell, 2010) in which it is incorporated into SL. In this study the confidence was measured by using three questions adapted from Bers, Doyle-Lynch and Chau (2005), and four other questions modified from (Liaw, 2008).
- **Motivation:** The psychological quality that leads individual to achieve a specific goal. Motivation to learn is promoted when the knowledge to be learned is perceived to be meaningfully related to a learner's goals (Wlodkowski, 2011). Motivation for this study presents the nurses engagement to use the different learning resources in the SL environment in which it simplifies the learning process through the environment elements. In this study the motivation was

measured by using thirteen questions adapted from (Glynn, Brickman, Armstrong, & Taasobshirazi, 2011).

- **Self-regulated learning:** Refers to ability to control and understand the context of their learning environment (Zimmerman & Schunk, 2001). In regard to this study, self-regulated learning refers to the process that assists nurses to manage their thoughts and behaviours in order to successfully navigate their learning experiences while using SL. This can occur when nurse's actions and processes are associated with the acquisition of information and experience in SL. In this study the self-regulated learning was measured by using twelve questions adapted from (Lan, Bremer, Stevens, & Mullen, 2004).
- **Collaborative learning:** Refers to the level of interaction between multiple participants, who thus need to maintain some degree of mutual understanding (Baker, Hansen, Joiner, & Traum, 1999). The process by which this is accomplished is termed grounding (Stacey, 2007). In this study, it can be identified in the nurse's interactions in SL where learners can work in peers to simulate learning. In this study the collaborative learning was measured by using fifteen questions adapted from (Brown, 2008).

1.10 Summary of the Chapter

This chapter introduces the research background toward the use SL environment among student nurses to promote their self-regulated learning and collaborative learning simulated by their level of confidence and motivation to use the tool in learning. The research problem was described based on the current challenges faced by nurses during the learning process. This chapter presents the research theoretical

and conceptual frameworks that were constructed based on premises of self-regulated model, theory of Task Technology Fit (TTF) and simulation theory.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter introduces an overview of the literature on Second Life (SL) applications in promoting the teaching and learning practices in nurse education. It also describes the relevant research theories to explain how the proposed research variables are linked to each other. A review of the previous studies was also provided in order to construct the research hypotheses.

2.2 Virtual Environments

The term virtual environment simply refers to the application and technology which produces physical immersion, and is not, as commonly believed, a type of virtual environment itself. Virtual environments are mainly desktop-based 3D spaces. All data is online, the worlds run almost continuously. This presents for continual world states, which are reachable from any place, at all times as shown in Table 2.1. The '3D effect' is notional, launched by and looked at on standard computers and screens. It allows people to employ a wide choice of social spatial skills (Benford et al. 1994). McLellan (1996) also suggests that 3D VE are suitable for model building and problem solving, making them usable for learning. In experimental research, scientific writing shows a research gap in the worth of 3D VE for collaboration. Casanueva and Blake (2000) showed that being aware of collaborators and their activities can be improved by representing persons more realistically.

Table 2.1

Comparison between VR Systems and Virtual Worlds.

	Virtual Reality System	Virtual World
Installation	Local; physical installation (e.g. CAVE systems)	Online; data is held on servers
Access	Local, using expensive, special hardware	Log in from anywhere, using standard computers or laptops
Predominant type of immersion	Physical immersion	Mental immersion
Predominant type of presence	Non-sentient presence	Sentient presence
Predominant user representation	Not in focus	Customizable avatars

In this study, the researcher considered the design of a specific 3D environment such as Second Life (SL) to allow student nurses to insert and place knowledge into the virtual space. This is mostly because student nurses can easily use SL to learn aspects related to their practices taught in the previous years of study. Student nurses can apply the process known as inter-reality where they can experience interactive exchange of information in online. This has been obtained by creating a feeling of presence, which is the sensation of being together despite being at different locations. In this regard, the researcher simulates a SL environment for providing a means of direct intimate of spatial metaphor related to student nurse practices.

2.3 Use of SL in Educational Context

Von der Emde et al. (2001) pointed out the pedagogic advantages of using SL in learning:

- Through reliable communication; student autonomy and support for learner-centred curriculum; individualized learning for timid students.
- Through experimenting and playing.
- Through students researching.

They also covered the community-based makeup of these situations since students start learning from one another. Also, they found that three main ways student is assisted in SL. To begin with the exercises, students need to be focused with complete substance based objectives. Next, students need to advance free adapting by giving them a chance to settle on their own learning objectives and track their own advancement. As for the instructors, they need to frequently audit the understudies' portfolios and their endeavours. Some SL related applications have grown tremendously based on the emphasis on providing sophisticate and user autonomy; especially the introduction of construction tools which add a great deal of control and creativity.

Dickey (2003, 2004, 2005a, 2005b) expresses that SL has the potential to aid the peer-to-peer communication and exchange of views by consolidating ongoing correspondence with a visual setting and numerous collective assets, making a multidimensional environment for understudies to team up and apply their aptitudes, empowering talk among learners, enhancing and strengthening intelligence in learning circumstances. Since reproduced items are exceptionally intuitive, theoretical seeing in virtual situations is better (Dalgarno, Hedberg & Harper, 2002). Such association with the nature influentially draws learners' consideration and inspiration. Jackson and Winn (1999) said that elementary and tertiary-level students enjoy their interactions, and the degree of interaction is positively influenced by

collaboration. However, it is not easy to appraise how effective virtual interaction is. A study by Peterson (2006) found that several factors influence interaction in a virtual setting. Brown and Bell (2006) define a continual collaborative virtual sphere as a complex social organization. They also study how the medium supports social activities and how real-time chat promotes conversation among avatars unfamiliar with each other, as it is more challenging to start face to face conversations. Childress and Braswell (2006) show how SL entices online students to relate more to each other and the instructor. They found that individuals bantering continuously with different symbols use emoticons and particular moves, that graphical backing of SL present visual input that develops the communication while information be imparted. These social properties of virtual planets make them suitable for joint learning. Moreover, through offering gathering exercises, they support basic deduction and critical thinking aptitudes (Garrison, Anderson & Archer, 1999). Dillenbourg et al. (2002) stated that “collaborative learning is not a widespread formula as they feel a few teachers expect excessively from the rewards of virtual spaces”. It is unrealistic to guarantee an effective coordinated effort without full communication, or examining implications and parts. They push the estimation of educating by proposing two particular approaches to do shared procedures. Cooke-Plagwitz (2008), found SL to be very convenient in teaching foreign languages. Krish (2008) offers workable suggestions for online language teachers. Baker, Wentz and Woods (2009) stress the need to formulate distinct teaching objectives, avoid complicated tasks, and take learners’ opinions into account while conceiving of new activities in SL. Finally, Kuriscak and Luke (2009) studied the mannerism of online language students in SL by delving into the link between corrective feedback and learner accomplishment, and stated that feedback from native language is more

positively accepted than from non-native speakers.

2.4 Related Works on SL in Nurse Learning

Expert and individual clinical learning knowledge is important to create skilful attendants (Benson, 2004). Traditionally, nursing understudies have taken part in experiential learning exercises through clinical field positions. In any case, clinical field positions are not flawless (Heinrichs, Youngblood, Harter, & Dev, 2008). In the present moral and expert setting, nursing knowledge gained by clinical practice has reduced patient security and morals (Lee, Del Castillo, Bowyer et al., 2007). To determination this, medicinal services educators have utilized recreated exercises that can replicate encounter by different strategies. To expand the profits of reproduction in developing the learning procedure, specialists have contemplated the impact of incorporating innovation with constructivist strategies in re-enactment preparing. They found that scenario-based simulations could help student nurses in the passage to real patient consideration and clinical situations (Alinier, Hunt, Gordon & Harwood, 2006). Consolidating specialized aptitudes with human components, group administration, and situational awareness, members at the same time learn and create clinical abilities and ideas on patient health (Alinier, 2007).

SL offers a singular and adaptable state for educators involved in distance learning, computer-supported cooperative work, simulation, new media studies, and corporate training. SL allows the use of simulation to further experiential learning, letting individuals practice skills, try new ideas, and learn from their errors. SL currently involves a number of projects in medical and health education. For