RELATIONSHIPS BETWEEN PUTRALMS SUCCESSFUL FACTORS,MOTIVATION TO LEARN, AND SELF REGULATED LEARNING STRATEGIES AMONG UNDERGRADUATE STUDENTS IN A MALAYSIAN PUBLIC UNIVERSITY

SHAYESTEH HASHEMYOLIA

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By

SHAYESTEH HASHEMYOLIA

Thesis Submitted to the School of Graduate Studies, Universiti Putra Malaysia, in Fulfillment of the requirements for the Degree of Doctor of Philosophy

October 2015

DEDICATION

This endeavor is dedicated first to the almighty Allah, without him, we are nothing, but through him all things are possible

I would like humbly to dedicate this thesis to The Loveliest Father and Mother
With Love and Gratitude

Abstract of thesis presented to the Senate of Universiti Putra Malaysia in fulfillment of the requirement for the Degree of Doctor of Philosophy

RELATIONSHIPS BETWEEN PUTRALMS SUCCESSFUL FACTORS, MOTIVATION TO LEARN, AND SELFREGULATED LEARNING STRATEGIES AMONG UNDERGRADUATE STUDENTS IN A MALAYSIAN PUBLIC UNIVERSITY

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Learning management system (LMS) as a supplementary tool is widely utilize in face to face classroom to enhance students' learning. The higher education institutions in Malaysia integrates LMS to increase learning quality. The main objective of this study is to identify the relationship between PutraLMS successful factors, motivation to learn, and use of self-regulated learning strategies (SRLS) among undergraduate students who used LMS as technology enhanced learning in a blended learning environment.

In order to achieve the objectives, this study used quantitative survey research method to measure the individual attitudes and opinions toward some issues, identify relationships among variables, and interpret their behaviour. Undergraduate students in Universiti Putra Malaysia (UPM) were chosen as population of the study since UPM has a long history in implementing LMS in teaching and learning in variety of courses. This study used stratified random sampling technique. Thus, three faculties in science and three faculties in social science were randomly selected. 365 questionnaires were distributed in May 2013, with a total of 282 questionnaires collected and usable for data analysis.

This study used questionnaire of the perceived LMS interactivity, usefulness, and satisfaction based on two model as Three Tier Model (TTM) and DeLone and McLeen model (D&M). Moreover, for assessing the students' motivation to learn and use of self-regulated learning strategies, this study used Motivated Strategies for Learning Questionnaire (MSLQ). This study considered students' motivation to learn and use of self-regulated learning strategies in terms of five factors; namely intrinsic goal orientation, task value, self-efficacy, metacognitive and resource management strategies. The resource management strategies include time and environment management, effort regulation, help seeking and peer learning. The questionnaire reliability was tested in pilot study and validity was checked by a group of expert

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panel. The data assumptions (normality, linearity, collinearity, and outliers) were met threshold value before inferential statistical analysis.

The descriptive result showed that (i) The students evaluated PutraLMS in high level in terms of interactivity, satisfaction, and usefulness. The students' motivation to learn and use of self-regulated learning strategies were in moderate level. (ii) The result of structural equation modeling (SEM) of testing hypothesis in LMS successful model of study, showed that interactivity is significantly related to usefulness (β=.466) and satisfaction (β=.476). Moreover, there was significant relationship between satisfaction and usefulness (β=.380). (iii) Students' perception towards LMS predicted students' motivation to learn with different standard regression weight. In this case, motivation to learn was significantly more influenced by perceived usefulness with (β=.480) compared with perceived satisfaction (β=.253). (iv) The findings of this study revealed that students' motivation to learn significantly related to the students' usage of metacognitive (β=.643) and resource management self-regulated learning strategies (β=.498). (v) The result of mediation test of bootstrap result showed that satisfaction has an important role in relationship between interactivity and usefulness (β=.46). Moreover, perceived satisfaction had a direct and indirect effect on motivation to learn. The result indicated that indirect effect of satisfaction on motivation to learn is partially mediated by usefulness (β=.24). Finally, the statistical analysis of mediation model shows that motivation to learn as the third variable facilitated the relationship between perceived satisfaction of LMS and use of self-regulated learning strategies (β=.21). According to the findings, three mediation variables (perceived usefulness, satisfaction, and motivation to learn) partially mediated the relationship between independent and dependent variables.

The implications obtained from the results of this study supports Social Cognitive Theory that predicting a wide range of variables influencing students' use of SRLS in blended learning environment. Theoretically, this study indicated that LMS as a part of face to face course plays an important role in the students' motivation to learn and use of SRLS. Accordingly, motivated learners take more responsibility for their learning to be successful.

As a conclusion of this study, motivation to learn plays a central role on the relationship between students' use of SRLS and perceived LMS usefulness. Thus, these two variables must be taken into account in formulating education policy, in order to help students use the SRLS effectively and enhance efficiency of LMS in education.

Abstrak tesis yang dikemukakan kepada Senat Universiti Putra Malaysia sebagai memenuhi keperluan untuk Ijazah Doktor Falsafah

HUBUNGAN ANTARA FAKTOR KEJAYAAN PUTRALMS, MOTIVASI UNTUK BELAJAR DAN STRATEGI PEMBELAJARAN REGULASI KENDIRI DALAM KALANGAN PELAJAR PRASISWAZAH UNIVERSITI PUTRA MALAYSIA

Oleh

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Sistem pengurusan pembelajaran (SPP), sebagai bahan sokongan proses pembelajaran telah digunapakai secara meluas dalam corak pembelajaran interaksi bersemuka. Kini institusi pendidikan tinggi di Malaysia telah mengintegrasikan SPP bagi meningkatkan kualiti pembelajaran. Objektif utama kajian ini adalah untuk menentukan hubungkait antara faktor kejayaan SPP dengan faktor motivasi pelajar serta faktor penggunaan strategi pembelajaran berasaskan regulasi kendiri, dalam kalangan pelajar prasiswazah yang menggunakan SPP sebagai pemudahcara proses pembelajaran dalam persekitaran pembelajaran bersemuka bercampur penggunaan media teknologi.
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Bagi mencapai objektif tersebut, kajian ini menggunakan reka bentuk kajian tinjauan kuantitatif bagi pengumpulan data memandangkan reka bentuk ini mengukur sikap individu dan pendapat mereka terhadap isu tertentu, menentukan hubungan antara pembolehubah dan melakukan interpretasi kelakuan mereka. Pelajar pra siswazah di Universiti Putra Malaysia (UPM) merupakan populasi kajian memandangkan UPM telah lama mengimplementasikan SPP dalam pengajaran dan pembelajaran dalam pelbagai kursus. Kajian ini menggunakan persampelan rawak berlapis. Tiga fakulti dari bidang sains dan tiga fakulti dari bidang sains sosial dipilih secara rawak. Pada bulan Mei 2013, 365 soal selidik telah diedarkan dan sejumlah 282 soal selidik dikumpul dan digunakan untuk analisis data.

Kajian ini menggunakan soal selidik persepsi interaktif SPP, kebergunaan dan kepuasan berdasarkan dua model, iaitu Model Tier Tiga (TTM) dan Model Delone dan Macklin (D&M). Bagi menilai motivasi pelajar untuk belajar dan mengguna strategi pembelajaran berasaskan regulasi kendiri kajian telah mengaplikasikan Soal selidik Strategi Motivasi untuk Pembelajaran. Kajian ini mengambil kira motivasi pelajar untuk belajar dan penggunaan strategi pembelajaran berasaskan regulasi kendiri berdasarkan lima faktor; iaitu orientasi matlamat intrinsik, nilai tugasan, kecekapan sendiri, metakognitif, dan strategi pengurusan sumber. Strategi pengurusan sumber merangkumi pengurusan masa dan persekitaran, usaha regulasi, carian bantuan dan

pembelajaran rakan sebaya. Kebolehpercayaan soal selidik telah diuji dalam kajian rintis dan kesahihan soal selidik disemak oleh sekumpulan pakar panel. Andaian data (normaliti, lineariti, multikolineariti, dan data terpencil) telah memenuhi syarat paras terendah nilai boleh diterima sebelum analisis statistik inferensi dilakukan.

Dapatan deskriptif menunjukkan bahawa (i) pelajar menilai PutraLMS berada di tahap yang tinggi dari segi interaktiviti, kepuasan, dan kebergunaan.Motivasi pelajar untuk belajar dan penggunaan strategi pembelajaran berasaskan regulasi kendiri berada pada tahap sederhana. (ii) Keputusan model persamaan struktural (SEM) bagi pengujian hipotesis dalam model kejayaan SPP dalam kajian ini menunjukkan bahawa interaktiviti mempunyai hubungan signifikan dengan kebergunaan (β=.466) dan kepuasan (β=.476). Tambahan pula, terdapat hubungan signifikan antara kepuasan dan kebergunaan (β=.380). (iii) Persepsi pelajar terhadap SPP menjangkakan motivasi pelajar untuk belajar dengan pemberatan regresi standard yang berbeza. Dalam kes ini, motivasi untuk belajar adalah lebih dipengaruhi secara signifikan dengan persepsi terhadap kebergunaan, (β=.480) berbanding dengan persepsi terhadap kepuasan (β=.253). (iv) Dapatan kajian ini menunjukkan bahawa motivasi pelajar untuk belajar mempunyai hubungan yang signifikan dengan penggunaan metakognitif pelajar (β=.643) dan strategi pengurusan pembelajaran berasaskan regulasi kendiri (β=.498). (v) Keputusan ujian pengantaraan butstrap menunjukkan bahawa kepuasan mempunyai peranan penting dalam hubungannya antara interaktiviti dan kebergunaan (β=.46). Tambahan pula, persepsi terhadap kepuasan mempunyai kesan langsung dan tidak langsung terhadap motivasi untuk belajar. Keputusan juga menunjukkan bahawa kesan tidak langsung kepuasan terhadap motivasi untuk belajar adalah sebahagiannya dipengaruhi oleh kebergunaan (β=.24). Akhirnya, analisis statistikal bagi model pengantaraan menunjukkan bahawa motivasi untuk belajar sebagai pembolehubah ketiga yang merangsang hubungan antara persepsi terhadap kepuasan bagi LMS dan penggunaan strategi pembelajaran berasaskan regulasi kendiri (β=.21). Berdasarkan keputusan, tiga pembolehubah, iaitu, persepsi kebergunaan, kepuasan dan motivasi untuk belajar adalah pengantara sebahagian hubungan antara pembolehubah tidak bersandar dan bersandar.

Implikasi yang diperoleh daripada dapatan kajian menyokong teori sosial kognitif bahawa pelbagai pembolehubah mempengaruhi penggunaan SPP pelajar dalam persekitaran pembelajaran teradun. Secara teorinya, kajian ini menunjukkan bahawa SPP yg mengintegrasikan pembelajaran bersemuka dalam bilik kuliah memainkan peranan penting mendorong motivasi untuk belajar dan menggunakan strategi pembelajaran berasaskan regulasi kendiri. Sehubungan itu, pelajar yang bermotivasi lebih bertanggungjawab dalam menjayakan pembelajaran mereka.

Sebagai kesimpulan, motivasi untuk belajar memainkan peranan utama dalam hubungan antara penggunaan strategi pembelajaran berasaskan regulasi kendiri serta persepsi terhadap kebergunaan SPP. Oleh sebab itu, kedua-dua pemboleh ubah ini perlu diambil kira dalam merangka polisi pendidikan, agar dapat membantu pelajar menggunakan strategi pembelajaran berasaskan regulasi kendiri dengan efektif dan menggunakan SPP secara efisyen dalam pendidikan.

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This thesis was submitted to the Senate of Universiti Putra Malaysia and has been accepted as fulfillment of the requirement for the degree of Doctor of Philosophy. The members of the Supervisory Committee were as follows:

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This is to confirm that:
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LIST OF ABBREVIATIONS

SRLS	Self-Regulated Learning Strategies
LMS	Learning Management System
USF	Usefulness
INT	Interactivity
SAT	Satisfaction
MOT	Motivation to Learn
INC	Intrinsic Goal Orientation
TAS	Task value
SEL	Self-efficacy
MTG	Metacognitive Self-Regulated Learning Strategy
RSM	Resource Management Self-Regulated Learning Strategies
TIM	Time and Environment of Study Management
EFT	Effort regulation
HEP	Help Seeking and Peer Learning
MSLQ	Motivated Strategies for Learning Questionnaire

CHAPTER 1

INTRODUCTION

1.1 Background

Information Communication Technology (ICT) is increasingly used in education to support the teaching and learning process (Georgsen & Løvstad, 2014). The rate of ICT usage in education is different from face-to-face (F2F) instruction supported technology, as a blended learning environment to pure online-courses (Georgsen & Løvstad, 2014). Blended learning is widely used in universities and institutions around the world (Mathew, 2014). Most higher education institutions deliver courses by utilising online and F2F instruction to offer the best of both instruction (Mathew, 2014; Nazarenko, 2014). The most popular e-learning mode among higher education institution (HEI) in Malaysia is a supplementary to F2F mode, followed by blended learning mode (Embi, 2011; Ng, 2010). According to Graham, Woodfield, and Harrison, (2013), blended learning environment refers to a combination of F2F classroom and technology-mediated instruction. In this study, blended learning environment refers to F2F course utilising PutraLMS to enhance teaching and learning.

Blended learning environment allows learners access to knowledge in traditional F2F interaction and e-learning system interaction. The e-learning system can be used to complement and support traditional approaches and enable learners to access educational materials at their own pace and time, thereby enhancing their whole learning experiences (Mathew, 2014). This type of learning environment promotes exploratory and self-paced learning, where each individual takes responsibility for their own learning, which is also an important component of adult learning (Loureiro & Bettencourt, 2014). Kerres and DeWitt (2003) identified three critical components of blended learning that consider the content of the learning materials, communication between learners and instructor, as well as between learners and their peers (Wu, Tennyson & Hsia, 2010).

The blended learning environment integrates different ICT such as Learning Management System (LMS). LMS is a software package with pedagogical approaches and effective online learning community (Beatty & Ulasewicz, 2007). LMS is able to facilitate learning activities through several of its functions. For example, instructional delivery and communication between instructors and students can be performed at synchronous or asynchronous online system (Coates, James, & Baldwin, 2005). Such systems can provide instructors and learners with multiple, flexible instructional methods, educational technologies, extra learning resources and interaction to overcome the limitations of classroom.

Malaysia is regarded as a well-developed nation in educational sector. Malaysia is known based on its economy and location as a strategic educational hub in the Asian region since 2010 (WEAC, 2010). All universities in Malaysia offer LMS in higher education (Embi, 2011). Among the higher education institutions in Malaysia,

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Universiti Putra Malaysia (UPM) is one of the university that utilises LMS applications to enhance teaching and learning through PutraLMS (Hamat, Embi, & Sulaiman, 2011). UPM integrates the advantages of LMS in distance and blended learning environments.

This study focused on using LMS as a supplementary tool that is more popular among higher education and institutions in Malaysia. Azhar and Samsudin, (2012) emphases that future research should be address LMS in supporting and facilitating students' motivation to learning. Similarly, the previous studies argued that a personal and social learning environment has an important role on the students' motivation to learn and self-regulated learning (Dabbagh & Kitsantas, 2012; Bekele. 2010).

Motivated learner more engages in learning process and this engagement promote a higher quality of learning (Pintrich, 2000). The studies have shown that the motivated leaner more actively involved in their learning and they were self-regulated learners. Self-regulated learning emphasizes the students' control, autonomy, independent learning, and they have responsibility for learning process (Zimmerman, 2008; Yusuf, 2011). In this case, several studies examined different learning environment on students' motivation to learn and self-regulated learning. For example, Brak, Lan, and Paton, (2012) found online and distance learning environments increased the learners volitional control, motivation to use learning strategies, and persistence when tackled problems.

Therefore, this study investigates in what extent the F2F course which integrates LMS as a supplementary tool foster the students' motivation to learn and self-regulated learning. According to Zimmerman (2001), learning is a process of different self-regulated learning strategies. In other word, learning can assess in the students' ability to engagement in the learning process and changing strategies to better understanding. Therefore, the students' self-regulated learning strategies indicate the students' learning. The students need to be self-regulated learners, who take advantages from learning environments and are able to organise and reorganise learning strategies necessary for better academic achievement.

1.1.1 Self-Regulated Learning Strategies

Self-regulated learning strategies SRLS indicates the students' success in learning and plays a significant role in students' engagement (Bol & Garner, 2011). According to Ng (2010) self-regulated learning strategies is one of the most interesting research areas because it explains how individuals regulate their own physical, behavioural and psychological factors. SRLS is defined as a learner's ability to analyse learning situation, set meaningful learning goals and determine which strategies to use, and also assess whether the strategies are effective in achieving their learning goals and evaluate their understanding of the topic. They also need to monitor their understanding and modify their plans, goals, strategies and efforts based on changing contextual conditions. These completed strategies indicate learners' ability in SRLS (Pintrich, 2000; Zimmerman, 2001; Azvedo *et al*., 2008). Thus, students need SRLS to become

active participants in learning activities (Cleary & Zimmerman, 2012; Abrami, Bernard, Bures, Borokhovski, & Tamim, 2011).

In the context of this study, SRLS includes two more critical constructs as metacognitive (Sak & Leijen, 2014; Bol & Garner, 2011; Greene, & Azevedo, 2009) and resource management strategies (Dabbagh & Kitsantas, 2005, 2012; Amador & Amador, 2014). Metacognitive SRLS is the macro level of SRLS, which is more important than cognitive concept (Greene & Azevedo, 2009). Metacognitive scale is one of the key scales when it comes to assessing the regulation of cognition. Moreover, metacognitive covers cognitive strategy (Mokhtari & Reichard, 2002). Metacognitive SRLS explains the students' ability as active learners who are able to set goals for their own learning and then attempt to monitor, regulate, evaluate and control their cognition (Pintrich, 2000). In short, metacognitive SRLS elevates students' autonomy and independency. Thus, students are encouraged to become active participants in learning by establishing personal goals, selecting and modifying their learning strategies, as well as reflecting on the effectiveness of their learning strategies (Cleary & Zimmerman, 2012).

The second SRLS is resource management strategies that explains students' capability to arrange / rearrange the strategies to take more advantages of learning environment and resource available (Ghosh, 2011). The time and environment management SRLS are critical factors in blended or distance learning environment. According to Dabbagh and Kitsantas (2005, 2012) resource management SRLS are critical factors that are more related to a course with used LMS (Ghosh, 2011; Wang, 2011; Kauffman, 2004).

Self-regulated learning is based on Social Cognitive Theory (Zimmerman & Schunk, 2008) that explains how people acquire certain behaviours or strategies. This theory addresses the ways that learners actually learn. Social Cognitive Theory extracts students' behaviour in three viewpoints which are cognitive factor, behaviour factor and environmental factor (Bandura, 1991). According to Pintrich (1999), cognitive factor refers to the motivation to learn, behavioural factor refers to SRLS and environmental factor refers to the features and facilities of learning environment.

Self-regulated learners as active and volitional behaviours perform different learning strategies to achieve in their learning. These strategies of self-regulation have been utilized in social relationships as well as in learning (Brak *et al.,* 2012). Self-regulated learners would appear to centre and acts based on their environment. Thus, this study examines the students' SRLS in especially important given F2F learning environment enhanced by LMS facilities that requiring individuals to be more autonomous in their learning.

1.1.2   Motivation to Learn

The concept of self-regulated learning is theoretically composed of two broad areas: motivation to learn and self-regulated learning strategies (SRLS) that are closely related and these two concepts might operate independently (Pintrich, 1999; Valentín,

Mateos, Tablas, Pérez, López, & García, 2013; Kou, 2010). Students' use of SRLS is dependent to their motivation to learn (Cleary & Chen, 2009; Cleary & Zimmerman, 2012). In this case, Schunk (2005), citing from Pintrich and Zusho (2002), stated that motivation to learn is an important factor in SRLS. He mentioned that the motivation to learn is a key factor that impacts all phases of SRLS although it is positioned as a separate area of self-regulation.

In the context of this study, motivation to learn involves intrinsic goal orientation (Lynch & Dembo, 2004), task value (Artino & Stephens, 2009) and self-efficacy (Shea & Bidjerano, 2010; Jaafar, Suriana, & Suhaily, 2014). Pintrich (1999) argued that SRLS can be facilitated by adoption of intrinsic goals and hindered by extrinsic goals. The study mentioned that an intrinsic goal seemed to be more adaptive with SRLS than an extrinsic goal. Similarly, Pintrich (1999) indicated that intrinsic goals can have some positive effects on SRLS and deeper levels of engagement. The results of a study conducted by Cho and Shen (2013) showed that intrinsic goal and self-efficacy were positively associated with the students' effort regulation, metacognitive and interaction regulation, although extrinsic goal orientation was not associated with SRLS. Since the students with intrinsic goal orientation are more willing to take challenges and are more curious to participate in tasks while the students with extrinsic goal orientation are more concern about the grade. Thus, intrinsic goal orientation is more adaptive with SRLS.

Based on social cognitive theory, the learning environment characteristic determines students' motivation to learn and academic behaviour. In other words, any changes in the learning environment may influence students' motivation to learn and academic behaviour (Leferancois, 2012). According to Pintrich, (1999) academic behaviour refers to SRLS that explained students' different strategies applying to better understand. This means the degree of students' motivation to learn indicate the students' effort regulation to accomplish task and maintain effort to achieve the learning goals. Therefore, the motivation to learn is an important factor in students' use of SRLS (Pintrich, 1999; Credé & Phillips, 2012; Yusuf, 2011). In order to increase students' motivation to learn, it is crucial to examine the learning environment facilities (Dabbagh & Kitsantas, 2012).

1.1.3   LMS Successful Factors

The F2F learning environment that integrates LMS with several opportunities enables learners to learn whenever they want, however they want and whatever they want (Wu *et al*. 2010). According to Embi (2011), majority of the students believe that the use of e-learning system in their courses has a positive impact on their performance. Based on higher education institution in Malaysia, most students and lectures (73.1%) agreed that LMS is an effective learning tool. They believe that using LMS is useful and effective in their learning and they are interested to use LMS.

LMS has been developed through years and facilitated education. It helps access documents used in lectures using interpersonal communication between students-students, student–content and students-instructor (Dias & Diniz, 2012). LMS might be

a great tool for managing blended learning curricula, it's enhance and facilitate content delivery and communication. LMS Success is full of advice regarding LMS administration that help to develop a LMS (DeLone & McLean, 2003). To achieve LMS success some factors is critic that define a LMS is doing well. The several models identify and describe the relationships among variables to provide a comprehensive model of LMS success.

Among the models, Three Tier Model (TTM) is relevant to SRLS. Based on the TTM model the learners' perception of LMS interactivity, usefulness and satisfaction as the information success can affect learners' motivation to learn and SRLS (Liaw & Huang, 2013). Moreover, DeLone and McLean (2003) investigate D&M Model of information success and argued that perceived LMS satisfaction have a relationship with perceived LMS usefulness.

Since, LMS provides and supports great opportunities for learner's interaction in F2F setting may increase the students' motivation to learn and SRLS (Bekele, 2010; Artino, 2009; Liaw & Huang, 2013). Thus, based on social cognitive theory, this study attempt to find relationship between the students' perception of LMS interactivity, usefulness, and satisfaction on motivation to learn and SRLS.

1.2 Problem Statement

Students' self-regulated learning strategies are issue for educational research in different learning environments (Cleary & Zimmerman, 2012). Several studies have shown that SRLS predicts the students' learning (Broadbent & Poon, 2015; Remali, Ghazali, Kamaruddin, & Kee, 2013; Pintrich, & DeGroot, 1990). According to Zimmerman (1990) SRLS shows how the students learn. Therefore, the lack of SRLS makes it difficult to evaluate the students' learning. In a learning environment where students utilise LMS, they have the freedom to choose (anytime and anywhere) and they are involved as active learners or students-centred learning. Thus, the students need to regulate their learning strategies effectively and consider alternative decisions, or find ways to attain deep understanding (Kramarski & Gutman, 2008; Azevedo & Cromley, 2004). Therefore, based on the viewpoint of Cleary and Zimmerman (2012), students' SRLS is an issue that needs further investigation.

Motivation to learn as a variable has an essential role in enhancing students' use SRLS. One of the greatest challenges for instructors is to provide a learning environment that stimulates students' motivation to learn (Brak *et al.,* 2012). Motivation to learn directs the students' behaviour to particular goals. Motivation to learn determines special goals and affect students' effort and engagement to achieve their goals (Pintrich, 2000). Lack of motivation to learn causes the students do not give enough importance to completing homework and make effort to accomplish tasks (Linnenbrink & Pintrich, 2002; Skinner, Pappas, & Davis, 2005). Since students are not interested with learning materials and are unwilling to learn (Dislen, 2013). Thus, lack of motivation to learn is the barrier to learning in classroom. Although the researches has discussed the relationship between motivation to learn and SRLS, the results showed that the relationship between motivation to learn and SRLS is not consistent (Jaafar *et al.,*

2014; Cho & Shen, 2013; Artino, 2009). In fact, the studies recommended that it is necessary to address students' motivation to learn and problems to use SRLS in a higher education (Tanzila, 2012).

Meanwhile, enhancing students' motivation to learn requires attention to be given to learning environment (Velayutham & Aldridge, 2012). Hence, this study investigates factors within the learning environment that would likely enhance students' motivation to learn and SRLS. Classrooms that offer no resources in the form of facilities, or computer access, may discourage students from pursuing higher levels of SRLS. In contrast, a classroom environment that gives students access to the internet and computers, interactive offers a personal space to carry out academic activities and promotes higher level of students' self-regulation (Judd, 2008).

Based on Social Cognitive Theory, several studies examined the impacts of different types of learning environment on students' motivation to learn and use SRLS. For instance, Amador and Amador (2014) integrated the effectiveness of Facebook in education on students' help seeking in SRLS. Tsai and Shen (2009) investigated the effects of web-based problem-based learning on SRLS, while Vovides *et al*. (2007) studied CMS and students' metacognitive SRLS. However, research in SRLS in different learning environments is still very much needed (Aydin, 2014; Zhan, Xu, & Ye, 2011). In this case Liaw and Huang (2013) examined the learning environment facilitated by LMS. Although, the study found LMS successful factors such as perceived interactivity, satisfaction, and usefulness have influence on students' SRLS, the study was limited to a few items of SRLS. Lee and Lee (2008) investigated the effects of SRL as a moderated variable in the relationship between LMS satisfaction and students' academic achievement. Therefore, there is practical gap in examining the influence of LMS in terms of interactivity, satisfaction and usefulness on students' motivation to learn in a blended learning environment.

The literature in Malaysia shows that there are some studies examining the relationship between the motivation to learn and SRLS in higher education. For example, Ghazali, Nik, Parilah and Wang, (2011) focused on students' level of SRLS. Yusuf (2011) examined correlation between dimensions of motivation. Jaafar *et al*. (2014) investigated the relationship between motivation and SRLS but the study was rather limited that it only had two dimensions of motivation and a small sample size. Azlina (2007) focused on students' SRLS level and the relationship with their academic achievement. Although Alias (2012) investigated on SRL among undergraduate students who used LMS, the study did not consider the effects of LMS on students' motivation and use of SRLS. Based on the researches in Malaysia, there are a few studies carried out in the blended learning environment where students used information technology in classroom; the studies, however, are limited to school students (Ng, 2010). Although the attention was given to LMS as a supplementary tool in F2F classroom, the researchers did not consider the influence of LMS successful factors which might increase the students' motivation to learn and use of SRLS. Thus, there is gap in Malaysia and SRLS among undergraduate students in F2F learning environment where LMS is used as a supplementary tool.

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In addition, there is a gap in the literature in relation to investigation of mediation variables that increase or facilitate the relationship between two other variables. Although Liaw and Huang (2013) investigated the relationship between LMS successful factors and SRLS, their study did not test the mediation effect of motivation that might facilitate the relationship between LMS satisfaction and SRLS. Moreover, some studies found the correlation between perceived LMS interactivity, usefulness and satisfaction (Kuo *et al*., 2014; Ships & Philips, 2013; Wei, Peng, & Chou 2015) but they did not examine the mediation effects of these variables. This is another gap in the literature that they have not used this method of analysis. Based on Social Cognitive Theory, this study was conducted to additional research to look into whether perceived interactivity, satisfaction and motivation to learn are mediation variables.

1.3 Objectives of the Study

The main objective of this study is to develop a model that can predict factors influencing SRLS by undergraduate students who use PutraLMS as a supplementary tool. The four objectives of this study are:

1) To identify students' level of perception of PutraLMS successful factors, motivation to learn and use of SRLS.
2) To examine the relationship between PutraLMS successful factors and motivation to learn.
3) To examine the relationship between students' motivation to learn and use of SRLS.
4) To examine the mediation variables namely satisfaction, usefulness, and motivation to learn in relationship between PutraLMS successful factors and use of SRLS.

Objective 1

To identify students' level of perceived PutraLMS successful factors, motivation to learn and use of SRLS.

Research Question

What is the level of UPM undergraduate students' level of perception of PutraLMS interactivity, usefulness and satisfaction in relation to their motivation to learn and use of metacognitive and resource management SRLS?

Objective 2

To examine the relationship between PutraLMS successful factors and students' motivation to learn. The five hypotheses outlined for this study are:

H_1. There is a significant relationship between perceived PutraLMS interactivity and perceived PutraLMS usefulness.
H_2. There is a significant relationship between perceived PutraLMS interactivity and perceived PutraLMS satisfaction.
H_3. There is a significant relationship between perceived PutraLMS satisfaction and perceived PutraLMS usefulness.

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H_4.   There is a significant relationship between perceived PutraLMS usefulness and students' motivation to learn.

H_5.   There is a significant relationship between perceived PutraLMS satisfaction and students' motivation to learn.

Objective 3

To examine the relationship between students' motivation to learn and use of SRLS.

H_6.   There is a significant relationship between motivation to learn and use of metacognitive SRLS.

H_7.   There is a significant relationship between motivation to learn and use of resource management SRLS.

Objective 4

To examine the mediation variables namely satisfaction, usefulness, and motivation to learn in relationship between PutraLMS successful factors and use of SRLS.

H_8.   Perceived PutraLMS satisfactions significantly mediated the relationship between perceived PutraLMS interactivity and perceived PutraLMS usefulness.

H_9.   Perceived PutraLMS usefulness significantly mediated the relationship between perceived PutraLMS satisfaction and motivation to learn.

H_{10}.   Motivation to learn significantly mediated the relationship between perceived PutraLMS satisfaction and SRLS.

1.4   Significance of the Study

This study addresses students' motivation to learn and SRLS in F2F course which integrated LMS as a supplementary tool. To the researcher's knowledge, the model has rarely been applied in a blended learning context. This study highlights Social Cognitive Theory based on the characteristics of F2F course that uses LMS as a supplementary tool to increase students' interactions and maximise their SRLS. In particular, this study focused on determining any correlation between students' perception of LMS interactivity, satisfaction, usefulness, motivation to learn and SRLS.

Therefore, the present study appears to be quite promising as it will present more implications in the extent to which LMS, as a supplementary tool (content delivery, communication tool), will motivate students to learn and use SRLS. For example, discussion forum embedded in LMS allows students to post views and questions, as well as respond to other students' views and questions. A course that utilises online forum outside class can facilitate students' motivation to learn and use SRLS (Yen, & Lee, (2011). Another advantage of this study is that it will reveal the extent to which the students' usage SRLS influences their motivation to learn. Therefore, the present study will indicate the effects of F2F course by integrating LMS that is able to increase students' motivation to learn and contribute to the use of SRLS.

Moreover, this study might be helpful for educators to develop course with LMS tools that encourage students to become self-regulated learners. The instructors can also identify the extent of LMS interactivity, satisfaction and usefulness which would be more influential to students' motivation to learn and use of SRLS.

It also aims to investigate the relationship between perceived LMS satisfaction and use of SRLS, with the motivation to learn as a mediator variable. This analysis was conducted with the Bootstrap analysis using AMOS. The use of AMOS provides a sound background and foundation to present the relationships between constructs in comprehensive model fit, as well as the direction and size of each relationship. This will provide valuable implications and suggestions to the existing body of literature in Social Cognitive Theory.

1.5   Limitations of the Study

This study is limited to UPM, a public university, and limited to PutraLMS as its purposeful sample. This study is also limited to the context of F2F enhanced by LMS as a supplementary tool. Thus, students' perception of LMS may differ from those in other settings such as pure distance learning environment where students are more influenced by LMS.

This study is limited to UPM students' perception of SRLS or perceived learning. There is a gap between perceived learning and students' outcomes as grade can be examined after intervention SRLS. Based on the findings of previous studies, students' SRLS was found to have a directly effect on their outcome or academic achievement (Credé & Phillips, 2012; Schwingera, Steinmayr, & Spinath, 2009).

This study is also limited to how long learners used LMS, i.e. for more than 2 hours a week. According to the studies conducted in this area (see Ozkan & Kostler, 2009; Wu *et al.*, 2010; Parai *et al.*, 2014), students often use LMS for an average of 2 hours a week. Therefore, based on the demographic information of this study, the learners who used LMS for less than 2 hours were excluded from the data analysis. Moreover, according to the definition of active learners, this study assumed that students who used LMS as a communication tools are different from passive learners (Wolff *et al.*, 2015). Since active learners prefer discussing and interacting more frequently with their instructor and friends to solve the problems and for deep learning (Zhan *et al.*, 2011), they are different in their perception of LMS interactivity, satisfaction, and its usefulness, which might have effects on their motivation to learn and use of SRLS.

Therefore, generalisation of this study is limited to the context of F2F course that LMS enhanced learning environment. This also means that the findings cannot generalised to other contexts such as pure online learning environment and traditional learning environment.

1.6   Definition of Terms

Learning Management System (**LMS)** is a software system designed for online education with different internal organisations that involve course management, content authoring, collaborative discussion, virtual classroom, as well as testing and grading used in online courses (Ting & Chao, 2013). In this study, LMS is represented in UPM as PutraLMS.

LMS Successful Factors indicate learners' perceptions of LMS usefulness, satisfaction (Al-Busaidi, 2012; DeLone & McLean, 2003) and its interactivity (Liaw & Huang, 2013). LMS as any information system success can be assessed based on different known models such as TTM and D&M model in terms of users' satisfaction (Almarashdeh, Sahari, Zin, & Alsmadi, 2010), perceived usefulness, and interactivity (Kang & Im, 2013). In this study, LMS successful factors refer to undergraduates' perception of PutraLMS interactivity, satisfaction and usefulness.

> **Perceived Interactivity** determines the extent to which users perceive simulation of three types of interactions (learner-learner, learner-instructor and learner-content) (Liaw & Huang, 2013; Pituch & Lee, 2006). In this study, perceived interactivity refers to the degree in which undergraduates perceived PutraLMS as assisting the interaction between learners and learners, learners and lecturer, and learners and content.
>
> **Perceived Usefulness** refers to the degree of goal achievement by using a particular product that is effective and efficient (Lee & Lee, 2008; Liaw & Huang, 2013). In this study, usefulness refers to the degree of undergraduates' perception using PutraLMS in enhancing and facilitating learning achievement.

Perceived Satisfaction is defined as users' acceptance of an information system and the degree of comfort involved in using the system (Liaw & Huang, 2013; Lee & Lee, 2008). In this study, perceived satisfaction refers to the degree of undergraduates' feelings and acceptance toward the PutraLMS system.

Motivation to learn refers to the degree of desire to participate in the learning process that can be examined from persistent activities (Schunk, 2005; Pintrich, 2000). According to Pintrich (2000), motivation to learn is defined as the students' goal-directed activities, self-efficacy and degree of value learning materials that encourage them to involve in academic activities. In this study, motivation to learn refer to degree of undergraduates' setting of desired goals, perceptions toward the learning material and confidence in understanding materials in course that integrates PutraLMS facilities.

Self-regulated Learning Strategies (SRLS) are strategies that students apply to improve their understanding before, during and after the learning process (Zimmerman & Schunk, 2008). SRLS is defined by regulate strategic in metacognitive and resource management behaviour in the learning process (Pintrich *et al.*, 1993). In this study, SRLS refer to the degree of undergraduate students' ability to create a plan, monitor and evaluate their objectives and progress, and manage their time and learning environment to accomplish tasks.

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Metacognitive SRLS involve learners' ability to plan activities such as goal setting, monitoring and adjusting activities (Pintrich *et al*., 1999). Metacognition SRLS refer to regulation of the cognitive system that enables students to coordinate the use of current knowledge and reflective strategies to accomplish their goals (Zimmerman, 1989a). In this study, metacognitive SRLS refer to the degree of undergraduates' usage of different strategies in learning process such as setting goals, checking their tracks and changing the learning strategies for better comprehension in a course facilitated by PutraLMS.

Resource management SRLS are strategies to manage and control the learning environment that refers to time and environment study management, effort regulation, as well as help seeking and peer learning strategies (Pintrch *et al.*, 1993). In this study, resource management SRLS refers to the degree of undergraduates' ability to follow the schedule to accomplish task, effort and persistence to pursue their goals through learning course, help from and discussions with instructors and other students in a course with PutraLMS facilitated learning activities.

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