

CHAPTER 2: REVIEW OF RELATED LITERATURE

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2.0 INTRODUCTION

Systematic collection of relevant information pertaining to a particular topic is known as the review of related literature. It involves a focused reading with specific purpose. Review of literature includes theoretic discussions, reviews of the status of knowledge by authorities, description and evaluation of current practices. A thorough scrutiny of relevant research reports is essential to move the research in the right direction. It forms the basis of the research upon which all further analyses will be done.

Literature review conveys what ideas have been established on a particular topic and used to identify the gaps in the research area. Further, it leads to generate research questions, to decide the research methods, and to find solution for the problem. The deep knowledge on the research area enables the researcher to contribute further knowledge in the related area.

A study of literature pertinent to the present study has thrown light upon the workings of the problem. It has been helpful in planning and executing the present investigation in a systematic way. This chapter presents a review of related studies conducted in the field of usage of Learning Management System and Learning Styles.

2.1 STUDIES RELATED TO LEARNING MANAGEMENT SYSTEM (LMS)

A Critical Examination of the Effects of Learning Management Systems on University Teaching and Learning

Drawing on Australian experience, this paper presented a broad, critical examination of the potential impact of online systems on teaching and learning in universities. It discussed in particular, the possible effects of LMS on teaching practices, on student engagement, on the nature of academic work and on the control over academic knowledge. According to this study, there were three main drivers behind the adoption of LMS. First, LMS is a means of improving teaching efficiency. Second, the attractiveness of LMS is associated with the promise of enriched student learning. And finally, the competitive pressure between institutions. These systems and online learning in general, were seen to reinforce and enhance a diverse suite of constructivist pedagogies. This study further asserted that LMS is sometimes proposed as a key means of responding to massive

and increasing demands for greater access to higher education. Also, the rapid uptake of campus-wide Learning Management Systems (LMS) is enhancing the on-campus learning experience. The author concluded that LMS is part of an important culture shift taking place in teaching and learning in higher education (Coates, James & Baldwin, 2005).

How Often do Students use A Learning Management System in an On-Campus, Problem Based Learning Curriculum?

This study investigated how students used a Learning Management System, TopClass, in an on-campus course (Medicine) at The University of Melbourne. A total of 262 first year and 263 second year students of the Medical course were asked to complete a questionnaire in their PBL tutorials. The samples contained roughly equal numbers of male and female (male 45%; female 55%). A critical variable in this investigation was residency status (local students 68%; international students 32%). It was found that students were mostly using the LMS for viewing announcements, reading messages and discussions, downloading and printing lecture notes and to a lesser extent accessing other course materials, viewing self-assessment tasks and past-exam papers. Students were using the LMS to access and manage resources that are important for their learning. According to the students' perspectives, LMS was viewed as one single location to obtain a large number of resources online anytime and it increases efficiency by saving time and providing convenience. Students also used the LMS to keep up-to -date by reading the latest announcements provided by faculty and to read what some of their peers had written through discussion lists and messaging. In the comparison of international students and local students it was found that more international students participated in discussions than did local students, and more international students accessed the learning resources and assessment tasks than did local students (Petrovic & Kennedy, 2005)

What do University Students Expect from Teachers using an LMS?

In October 2006, a survey was conducted at an Australian university that was aimed at gaining student feedback on future and current IT services. Two questions were specifically targeted at finding out about students' use of the university's central Learning Management System (LMS). The LMS being used at that time was Blackboard (Bb) version 6.3. While one question asked whether or not students used the system

(N=6,724), the second question invited them to comment on what they liked and disliked about the LMS (N=4,538). The latter question elicited rich qualitative data that was analyzed using two methods. Initial themes were noted through a manual analysis and then data was run through a software program called Leximancer. This program analyzed the conceptual structure of the data. While some themes related to student preferences around the LMS itself, a great deal of the data was linked to the ways the system was being used by university teachers. Student expectations around teacher use of the LMS form the focus of this paper and consequential challenges and future directions for staff development were considered (Steel, 2006).

Learning Management Systems in Higher Education: A Review from Faculty Perspective

This paper was based on author's perspectives and experiences as a lecturer in online, blended, and also web-enhanced courses. The two main objectives of this paper were: to discuss the factors to be considered while selecting a suitable LMS, and to share perspectives and experiences among lecturers to respond to the increased expectation in integrating such technology in higher education teaching. This paper portrayed that LMS has been widely used and will continue to grow in many higher education institutions. It is not only limited to the online environment, but also integrate in the hybrid and web-enhanced teaching and learning environment. In addition, the uses of LMS to facilitate interaction enhance learning abilities and support higher-order learning, including problem solving, critical thinking, and collaboration skills. The author suggested that a good practice of LMS should include active learning, prompt feedback, completion of work on time, and features to meet the needs of diverse learners. The author also insisted that though LMS has been proved as beneficial to student learning, the real challenge is how LMS can be used to engage students with meaningful, collaborative and interactive learning experiences (Monsakul, 2007).

Measuring Student Perception and Actual Usage of Online Learning Management System

This study investigated whether there is a relationship between the perception of a student regarding the learning management system and their actual usage of such system.

This study adopted survey method and 24 second year engineering undergraduates registered for Computer Science course participated. An online questionnaire was published on a course management system for a selected subject and the student participation was voluntary. Results indicated that no significant relationship between the students' perception about the Learning Management System and the actual use of the system. However, a significant relationship was found between having internet access away from University and the student perception about the system. Students who had internet access away from University had better perception about the Learning Management System even though there was no significant difference in the level of online Learning Management System usage between the groups (Liyanagunawardena, 2008).

Learning Management Systems and E-Learning within Cyprus Universities

This article presented an extensive research study and results on the use of existing open-source learning management systems within the public and private Universities of Cyprus. The most significant objective of this research was the identification of the different types of E-Learning, i.e. Computer-Based Training (CBT), Technology-Based Learning (TBL), and Web-Based Training (WBT) within Cyprus Universities. The article identified the benefits and limitations of the main learning approaches i.e. synchronous and asynchronous learning, used in higher educational institutions. The study also investigated the open-source LMS used in the Cypriot universities and compared their features with regards to students' preferences for a collaborative e-learning environment. The required data for this research study were collected from 278 people comprised of undergraduate and graduate students, alumni, faculty members, and IT professionals who currently work and/or study at the public and private Universities of Cyprus.

The findings showed that the asynchronous communication tools like E-mail and synchronous communication tools like Instant Messaging were widely used among the people with different academic positions who have participated in this research. According to the results, social bookmarking was a less investigated web collaboration tool by most of the participants. On the other hand, Wikipedia was seemed as the most popular web collaboration tool among most of the participants in the study. The most

popular personal productivity tools used mainly by the students and faculty members were online calculators, spell checkers, and social networks. The most noteworthy recommendation of this study was the clear indication that most of the undergraduate students that extensively use the specific e-learning platform of their university do not have a clear picture of the differences between an LMS and a VLE. This study further suggested the maximum use of the different features offered by the specific e-learning platforms for a potential teaching- learning experience (Amirkhanpour, 2011).

Academic and Student Use of a Learning Management System: Implications for Quality

This study was conducted through an anonymous online survey in which 96 instructors and 1314 students from an Australian University participated. In this study, students and staff appeared to have contrasting priorities: teachers were more concerned with technical aspects and workload issues, and students were more concerned with the quality of the online teaching, which was reflected in their perception that their teachers were not engaged with them in what they believed ought to have been an interactive learning environment. Results of the student survey data revealed that students were dissatisfied with poorly designed and maintained sites, rather than the lack of a site. The study further suggested that quality online learning approaches were an important adjunct to student learning, and if quality cannot be assured then online learning may be of little value (Weaver, Spratt & Nair, 2008).

A Framework for Adopting LMS to Introduce e-Learning in a Traditional Course

This study emphasizes the usage of LMS as a very helpful and flexible tool to enhance the blended learning and to improve the traditional learning methods. It presents a framework for introducing e-learning in a traditional course that can be used as a guideline for the development of an instructional model incorporating a pertinent “learner-centered” teaching. The author insisted that technology alone is not sufficient because teachers have to understand beforehand the potentials it offers in order to be able to use it effectively in redesigning their educational scenario. A survey was conducted among 316 students of Computer Science department and the results show that students who do not attend classroom lectures have a mentality that demotes the use of new

educational processes like LMS, whereas the students, who have no time to attend lectures but due to some work, tend to more promptly adopt the new educational model for their own improvement. Furthermore, students with easier access to the internet are more interested to use e-learning tools than students with limited access. The study concluded that e-learning methods and tools can indeed help in efficiently supporting the students and in improving the quality of teaching (Georgouli, Shalkidis & Guerreiro, 2008).

Comparison, Validation and Implications of Learning Style Theories in Higher Education in Slovenia: An Experiential and Theoretical Case

The aim of this study is to present, compare, validate and explore the learning styles of students enrolled in the course Economics of Education at the University of Ljubljana, Faculty of Economics (FELU) in Slovenia. Another purpose is to better understand the different learning styles among Management students in order to develop appropriate teaching and pedagogical strategies for improving Management Education at FELU. Additionally, the intention of this research is to develop a valid and reliable research questionnaire for further research processes and to set up research instruments as supportive mechanisms in Management Education and in the development of curricula and syllabi for new courses. This study method included both a descriptive and an exploratory perspective. In the first part of the study, the qualitative meta-analysis method was used to overview the literature background of the study. In the empirical part of the study the factor analysis using the Principle Axes Factoring method was used to extract learning styles. The adapted versions of Honey and Mumford's (1992) Learning Style Questionnaire (LSQ) and Dunn & Dunn's (2003) VAK Learning Style Theory (Coffield, 2004) were used as instruments in the questionnaire to determine Slovenian students' learning styles. The sample of the study consisted of 63 students at the Faculty of Economics, University of Ljubljana. Statistical analyses of the study resulted in a clear extraction of three theoretically expected learning styles dimensions according to Dunn and Dunn's learning style theory (factors - visual, auditory and kinesthetic) in the first factor analysis which confirmed the logic/applicability of the Dunn and Dunn's learning styles theory. Additionally, the results indicate that learning styles are insensitive to socio-demographic influences (gender and year of study). The authors articulate that each

student is unique in their approach to learning and the individual's choice of learning style is obviously based on personal/inner impulse rather than socio-demographic conditions. Finally, the authors concluded that it is the duty of educators in higher education institutions to provide meta-cognitive support for students, enabling them to reflect not just on what they learn but also how and why (Penger, Tekavčić & Dimovski, 2008).

A First Step in Evaluating the Usability of JUSUR Learning Management System

In this paper, Usability evaluation was carried out to assess the effectiveness of JUSUR, an LMS designed and operated by the National Center for E-learning and Distance Learning (NCeDL) in the Kingdom of Saudi Arabia. Usability evaluation was used to assess how well technology and tools were working for users. The study took place in the first semester of the academic year 2008/2009. 155 students in the Web Applications Engineering course, at King Saud University have participated in answering the evaluation questionnaires. Two standard questionnaires, SUS (System Usability Scale) and LMSUQ (LMS Usability Questionnaire) were used in this study. Items selected from these two questionnaires assess the system design/layout, functionality, ease of use, learnability, satisfaction, outcome/future use and system usefulness. The study concluded that JUSUR LMS was easy to use and learn for students with advanced computer competency. However, the malfunction of the search feature in the forum, the post organization in the forum and the difficulty of downloading course materials should be rectified (Al-Khalifa, 2008).

Digital Learning Management Systems in Africa: rhetoric and reality

This paper reported on a survey of 358 respondents across 25 African countries about their usage of Learning Management Systems. A questionnaire was prepared in hard copy, digital, and online format so that people could respond to the survey in a variety of ways. This research deliberately chose a range of different sampling methods and delivery modes in order to try to reach as diverse a group of respondents as possible. The authors drew five important conclusions as a result of this study. First, it was evident that whilst there were some ardent advocates on the use of LMSs across Africa, they were in a small minority. For many in Africa today, Learning Management Systems still mean access to the internet, and the use of e-mails for sharing information. Second, it was

evident that there were still huge infrastructural hurdles to be overcome, most particularly in terms of connectivity and electricity provision. Limitations in bandwidth and very high costs of internet access remain prohibitive constraints to the effective use of e-learning across Africa. Nevertheless, despite bandwidth and connectivity limitations, careful planning and appropriate allocation of scarce resources enable educational institutions to develop their own effective LMS-based digital learning environments. Third, despite some of the claims reflected in the survey results, it was evident that levels of training in the use of LMSs were generally very low. A fourth, more subtle concern highlighted here had been the general lack of effectively shared content and open educational resource development in Africa. It concluded that while there were some enthusiastic advocates of such systems, the reality is that most African educators as yet have little knowledge about, or interest in, their usage (Unwin, 2009).

The Role of Involvement in Learning Management System Success

This paper investigated the roles of student and instructor involvement in LMS success, using the DeLone and McLean (2003) model of information systems success as a framework. Data were gathered by online questionnaire from 244 students enrolled in an Australian university. The sample was selected by quota sampling technique. Involvement was found to be important to LMS success. Student involvement was shown to have a significant effect on the benefits to students of LMS use. The more involved a student is with the LMS site for a course offering, the stronger the benefits they report obtaining from use. On the other hand, student involvement did not have an effect on LMS use. Instructor involvement was found to guide appropriate use, both in terms of the nature of use and the extent of use. Furthermore, instructor involvement was shown to contribute to student benefits by affecting information quality which affects the benefits students receive from use (Klobas & McGill, 2010).

Factors influencing students' use of Learning Management System Portal: Perspective from Higher Education Students

In this study, an online Mathematics portal named as Portal of Learning Calculus (POLCA) is designed to provide a centralized point for students to access information during teaching and learning calculus at the university. This study aimed to identify the

factors that influence students using POLCA in teaching and learning of calculus at the University. Similar to other learning portals, POLCA also have applications such as interactive lecture notes, forums, quizzes, chat, online games, announcement, activities and so forth. Participants of this study were 215 Science students enrolled in a basic calculus course from five different classes of University of Malaysia. Students were made to be engaged with all of the activities in the portal for 14 weeks. The authors examined the relationship between the design of POLCA with students' technology competencies, role of lecturers, access to POLCA and attitude towards the usage of POLCA. Findings showed that students' technology competencies have the most influence followed by the design of POLCA, attitudes toward the usage of POLCA, the role of lecturers and finally access to the portal. The findings also revealed that there was a strong relationship between the design of POLCA, lecturers' role and access to POLCA with the attitudes toward using POLCA. However there is no relationship between students' technology competencies with attitudes towards using the learning portal (Ayub, Tarmizi, Jaafar, Ali & Luan, 2010)

Learners' Acceptance of Learning Management Systems: Developing a Theoretical Framework

This study claims that the success of Learning Management Systems in academic institution may be initiated by instructors' acceptance but it survives in the long run by learners' continuous acceptance and utilization. The main objective of this paper was to provide a comprehensive look at the critical factors that influence learners' acceptance of LMS and consequently their actual use. These critical factors were related to the major entities of LMS: the learner, the instructor, the course, the classmates, the organization, and the technology. This study provided useful implications and insights for researchers and practitioners on the acceptance of LMS. Furthermore, this study insisted that future empirical research is needed to provide a detailed investigation of the net benefits of LMS for learners, instructors and organizations (Al-Busaidi, 2010).

Instructors' Acceptance of Learning Management Systems: A Theoretical Framework

The success of LMS in any institution starts by instructors' acceptance, which in turn initiates and promotes learners' utilization of LMS. Accordingly, the objective of this

paper was to develop a theoretical framework for evaluating instructors' acceptance of LMS based on the Technology Acceptance Model. This framework provided a comprehensive look of the critical factors that influence the instructors' perceived ease of use and perceived usefulness of LMS and consequently the actual use. These critical factors were related to the instructor, organization, and technology factors. Instructor factors include self-efficacy, attitude toward LMS, experience, teaching style and personal innovativeness. Organization factors include motivators, technology alignment, organization support, technical support and training. Technology factors include system quality, information quality and service quality. This study proposed a detailed framework that can be used by researchers and practitioners to assess the instructors' acceptance of LMS, and ensure successful deployment of LMS (Al-Busaidi & Al-Shihi, 2010).

The Current and Future State of Learning Management Systems

In November 2010, Expertus and Training Industry, Inc. partnered to conduct a survey about the state of Learning Management Systems (LMSs). The survey was designed to better understand how learning professionals would grade their LMS, what their top challenges were and what features and functionalities were most critical to include in future LMSs. The survey was completed by 144 corporate and government training professionals in organizations with varying sizes throughout 22 industries. Technology companies were the largest industry represented with 19% of all survey-takers, followed by Education, Banking/Finance, Healthcare and Business Services/Consulting. The results revealed that personalized learning plans were the most frequently used LMS feature and were also the most often selected “essential” feature of future LMSs. The greatest differences between what learning professionals want and have in their LMS were in universal integration and integration with formal, informal and social learning. Learning professionals could use these results to inform decisions on how to customize, upgrade or select their LMS (Expertus, 2010).

An Exploratory Study: The Effectiveness of a Learning Management System in the Delivery of a Face-To-Face Programming Course

In this study, students' perceptions, expectations and effectiveness of the LMS as used in a campus-based programming course were determined among the undergraduate

student population. Students who were enrolled in two modules (n=20 and n=16) using LMS within a traditional, face-to-face course of an introductory level programming course participated in the study. All students from each course were included in the study and they were similar in age (between 19-20 years), and previous experience. No distinction was made between male and female students in this study. A questionnaire with regard to the undergraduate students' experience with the LMS in the university was administered and the quantitative data of this survey was supplemented with interviews of 20 students.

The results of the study showed that communication tools and online discussion boards were highly rated by the students and access to course materials, syllabus and sample quizzes were the next highly rated features. This suggested a strong dependence on the lecturer and the notion that one can be absent from lectures and still be up to date with the lectures and learning. The findings also suggested that the use of LMS in face-to-face learning does not inherently improve students' problem solving skill in programming. Rather the LMS is simply a means by which instructors can use to involve students and purposefully promote students' increased engagement with course material and discussion. Hence in this study, the LMS was seen as complementary rather than as a substitute for face-to-face lectures (Govender & Govender, 2010).

The Effectiveness of Learning Management System (LMS): Case Study at Open University Malaysia

This paper was measuring the effectiveness of Learning Management System of Open University Malaysia (OUM) by testing the usage of LMS by three categories of users which are novice, knowledge intermittent and expert users. In order to collect data regarding the effectiveness of OUM's Learning Management System, questionnaires were distributed to randomly selected users. In evaluating the OUM's LMS, three main tasks such as to test student's performance by doing an on-line quiz for the course that they registered, to join the discussion forum by posting and respond to their peer's message and finally to find one book by giving them the title of the book were selected. All the tasks should be completed within fifteen minutes or five minutes each tasks. After completing every section of the task the participant had to give the comments. The result of this research indicated that the overall level of the effectiveness of LMS in students'

point of view was in the acceptable level. This study also showed that the Learning Management System of Open University Malaysia was used effectively by students although students came from various levels of educational background, age, marital status, course, level of thinking and computer skills. Though novice users seemed lost and could not move around the system at the beginning stage, lastly they could use it effectively. The intermittent users at first did several errors but they could recover the errors easily. The expert users did not have any problem in using the Learning Management System (Abdul Rahman, Aswani & Nasir 2010).

Barriers to a Wider Implementation of LMS in Higher Education: a Swedish Case Study

This article investigates barriers to a wider utilization of a Learning Management System (LMS). The study aims to identify the reasons why some tools in the LMS are rarely used in spite of assertions that the learning experience and students' performance can be improved by interaction and collaboration, facilitated by the LMS. Lecturers' perceptions about the use of LMSs over a period of four years at the School of Engineering, University of Borås were investigated. Seventeen lecturers who were interviewed in 2006 were interviewed again in 2011. The lecturers still use the LMS primarily for distribution of documents and course administration. The results indicate that their attitudes have not changed significantly. The apparent reluctance to utilize interactive features in the LMS is analyzed by looking at the expected impact on the lecturers' work situation. The author concludes that the main barrier to a wider utilization of LMS is the lecturers' fear of additional demands on their time. Hence, if educational institutions want a wider utilization of LMS, some kind of incentives for lecturers is needed, in addition to support and training (Jurado, 2011).

The Use of Learning Management Systems: A Longitudinal Case Study

The main focus of this study is to provide useful information for educational institutions about critical points in the implementation process of an LMS. In this article, the use of Learning Management Systems (LMS) at the School of Engineering, University of Borås, in the year 2004 and the academic year 2009-2010 was investigated. The tools in the LMS were classified into four groups namely, tools for distribution, tools for communication, tools for interaction and tools for course administration and the

pattern of use was analyzed. Interpretation of the results showed that the available LMS is predominantly used to distribute documents to students. The use of tools follows the same basic pattern in the investigations in 2005 and 2011. The tools for distribution are used far more than tools for communication or tools for interaction. Many tools available in the LMS were hardly used at all and lecturers choose to use tools that facilitate their teaching process without affecting the pedagogical or methodological design of their courses. The study suggested that the tool “Surveys” should be used to collect students’ opinions in all course and the tool “Participants” should enable the lecturers to send group E-mail to their students and may be used to bring the course evaluation questionnaire to the students’ attention. The authors concluded that the future utilization of tools for interaction, and the transformation of educational practices, should be treated as one process of professional development and that lecturers should be strongly encouraged to look at the aims and purposes of education beyond the scope of single, subject specific courses (Garrote & Pettersson, 2011).

Attitudes of Saudi Universities Faculty Members towards Using Learning Management System (JUSUR)

The research aims to identify the attitudes of faculty members at Saudi Universities towards using e-Learning Management System named JUSUR. The main objectives of this study were to find out the attitudes of faculty members in Saudi Universities towards using LMS – JUSUR and to find the obstacles to use JUSUR from the viewpoint of faculty members in Saudi Universities. A total of 90 participants in this research were asked to complete a 5-point Likert scale questionnaire. The results showed positive attitudes of the members of the faculty at Saudi University towards E-learning management system JUSUR. Further, the results showed no difference in attitudes towards using the system among the faculty members regarding gender or the types of colleges humanitarian, scientific and health. These results indicated that the faculty members using JUSUR have sufficient awareness of the importance of the E-learning and using technology in teaching which represented a very encouraging sign for the development among faculty members in the area of using LMS. It was optimistic that the professors were the highest category having positive attitudes towards using the LMS (Hussein, 2011).

Use of LMS Functionalities in Engineering Education

This paper shows the partial results of a survey sent to all the members of the IEEE Education Society around the world about some aspects on the use of Learning Management Systems (LMSs) in Engineering Education. The main interest of this study was to learn how e-learning functionalities were being used in the field of Engineering Education. The survey was completed by 146 teachers (122 male and 24 female) who were teaching in universities. The questions on the survey were focused on the level of use of each e-learning feature and on the traditional versus on-line teaching. The functionalities selected in this study were: Content Delivery, E-mail, Tasks-Exercises, Forums, Mailing lists, Exams, Self-assessment, Surveys, Group work, Chat, Calendar, FAQs, Wikis, Blogs, Glossaries, Videoconference, Notebook, Whiteboard, Learning Paths, Student Portfolio, Podcast, Student Tracking, and Vodcast.

The results of this study found that MOODLE is the most used LMS and content delivery is the most used LMS feature followed by exam tools. With respect to the on-line versus traditional teaching, students preferred to have blended learning, a mixture of online and traditional teaching. With respect to the new topic of performing exams, the majority of teachers agree that they prefer traditional exams (with paper and pen) than modern ones (through computer). Regarding the LMS features, majority of teachers use LMSs with the consequence that more and better content has been created and delivered to students. The survey results also suggested that there is a lack of training in the different LMS features, and therefore there is a need for training in these features and in their use in teaching (Llamas, Caeiro, Castro, Plaza & Tovar, 2011).

Factors that Impact Student Usage of the Learning Management System in Qatari Schools

In an attempt to enhance teacher and student performance in school, a learning management System (LMS) known as Knowledge-Net (K-Net) was introduced in Qatari independent schools. This study explored the factors that impact student use of the LMS K-Net in Qatari independent schools. Quantitative data were collected through a questionnaire that was administered to students in 37 schools. A total of 1,376 students responded to the questionnaire. Semi-structured interviews were used to collect qualitative

data that helped to confirm the results of the quantitative data and to provide additional insight on students' perspectives regarding the use of the LMS. The results showed a strong relation between ICT knowledge and LMS usage. The correlation analysis on usage indicated that there was a strong correlation between parent and student usage. There was also a strong correlation between teacher and student usage but a weak correlation between teacher and parent usage. The authors suggested that the more ICT knowledge students have, the less prone they are to using the LMS. Attitudinal barriers were not predictive of usage. Student usage was strongly correlated to teacher and parent usage. This study was informative in evaluating LMS usage in Qatari schools (Nasser, Cherif & Romanowski, 2011).

Investigating Mobile Devices and LMS Integration in Higher Education: Student Perspectives

The main purpose of this study is to integrate mobile technologies and devices with LMS to create new trend in the learning environment. Participants in this study consisted of 93 students from the Department of Computer Information Systems at Near East University, Cyprus during 2010. During the survey, a questionnaire, students' perceptions of the new trend learning environment, prepared by the author was used to collect the needed information. The results of the study indicate that students want to use the new technologies like LMS and mobile phones in education for the reason that they see and use the technological devices in everyday life. The findings of the study proposed a powerful approach to facilitate the learning process of students through the use of LMS via mobile phone. As a conclusion, the study supported that using LMS on mobile devices is a vital learning platform for the future learning environment (Cavus, 2011).

Distance Learning Management System Requirements from Student's Perspective

The main focus of this study was to gather LMS requirements which provide desired functionalities for distance learning instruction. The authors believed that the importance of evaluation and assessment is to introduce the changes on the existing LMS and to address the need of distance learning students and updating the current system due to technology changes. A survey was conducted to view distance learning students' perspective of LMS requirements. Through literature reviews, five dimensions of user's needs were identified. Based on the dimensions, a set of questionnaire is constructed which

then was administered to distance learning students in four universities in Malaysia which offer distance learning courses. Results of this study indicated that students show positive agreement of the proposed requirement dimensions and strongly suggest to include the new feature in the future LMS such as plagiarism checker, Short Message Service (SMS), online survey, online journal and Really Simple Syndication (RSS). The study concluded that new requirements were needed to increase student utilization of the LMS in order to ease learning process and to achieve learning goals (Abood, Sahari, Azan & Alsmadi, 2011).

Social Network Based Learning Management System

The purpose of this paper is to enhance the benefit of social network as a media to enhance education. By making the e-learning as an embedded feature inside the social network, knowledge share and gathering among users and the source can be unlimited. This system is called social network based learning management system. This system made the administrator as the owner of learning contents and enabled them to manage their knowledge shares and virtual courses. The test done by applying 74 test cases that cover all functions in social network based LMS had resulted 100% functional. The positive means of the system was that activities in LMS were published over the Facebook members who joined the course, and key activities were published only to members' social friends. The architecture of social network in Facebook has made learning to have more social benefit. The paper further suggested that features like online examination, discussion forum and video chat can be developed to meet the students' learning needs. With Facebook as social network and LMS as learning media, there is a good opportunity to integrate these applications to create a constructive learning environment among the social network population (Ali, Santoso & Muslim, 2012).

Key Factors to Instructors' Satisfaction of Learning Management systems in Blended Learning

This study examined the key factors that influence the instructors' satisfaction of LMS in blended learning, and how this satisfaction is related to their intention to continuously use LMS in blended learning and purely for distance education. These investigated factors were related to instructors' individual characteristics (computer anxiety, technology experience and personal innovativeness), LMS characteristics (system quality, information quality and service quality), and organizational

characteristics (management support, incentives policy and training). The authors viewed that Learning Management System (LMS) enables institutions to administer their educational resources, and support their traditional classroom education and distance education. LMS survives through instructors' continuous use, which may be to a great extent associated with their satisfaction of the LMS. The study's sample included 82 instructors comprising of Professors, Assistant Professors and Associate Professors from Sultan Qaboos University (SQU) in Oman. The findings indicated that computer anxiety, personal innovativeness, system quality, information quality, management support, incentives policy and training were the key factors to instructors' satisfaction of LMS in blended learning. Furthermore, instructors' satisfaction was considered as the significant determinant of their continuous intention to use LMS in blended learning and their intention to purely use LMS for distance education (Al-Busaidi & Al-Shihi, 2012).

Faculty Perceptions and Use of a Learning Management System at an Urban, Research Institution

This study examined an online Learning Management System (LMS) in relationship to faculty in the School of Engineering and Technology at Indiana University-Purdue University Indianapolis (IUPUI). Survey questions focused on two main areas of inquiry, faculty usage and faculty perceptions of the Learning Management System. The faculty participants were also given an opportunity to respond to four open-ended questions including what they liked most and least in the system, suggestions for improving their use of the Learning Management System, and finally, how they could use the Learning Management System more effectively in their courses. The results show that most of the faculty are using the LMS to communicate to students, distribute materials including the course syllabus, and post grades. The majority of faculty indicated that they would like some sort of training on the LMS, and often specifically with various tools or advanced development. The study further claims that the most widely used LMS tool by the faculty members were Tests & Surveys tool followed by Calendar and Discussion Forums (Little-Wiles, Hundley, Worley & Bauer, 2012).

The Usage of LMS among Undergraduate Students

Learning Management System (LMS) is a knowledge management tool that supports knowledge sharing and communication among its participants. LMS is one of

the most popular applications among institution of higher learning in Malaysia. This study empirically investigated the activities that students mostly participated while they logged in to LMS. This study also investigated the impact of LMS on teaching and learning. Fifty respondents (final year students who enroll in project paper course) involved in this short survey. The results showed that most of the students use the features that were compulsory and useful for their exams. Communication tools like chat and discussion forum were rarely used by them. The findings were significant to LMS designers, providers and institution of higher learning that subscribe to the LMS and will give some insight on how the students utilize LMS (Kung, Fadhilah, & Wan, 2012).

Factors Influencing the Use of Learning Management System in Saudi Arabian Higher Education: A Theoretical Framework

The main purpose of this paper was to present the theoretical framework underlying a research on factors that influence utilization of the JUSUR Learning Management System (JUSUR LMS) in Saudi Arabian public universities. JUSUR LMS provided instructors with six efficient functions viz. student registration, course designing, content delivery, communication, tracking students' performance and student evaluation. The theoretical framework for investigating the factors influencing the utilization of LMS was drawn from the Theory of Reasoned Action and Technology Acceptance Model (TAM).

The authors argue that variables such as attitude of Saudi Arabian faculty members towards using LMS, their beliefs towards e-learning, and their competence level in using LMS were to be taken into consideration when using LMS for teaching and learning purposes. Attitude towards the use of LMS had three sub-sections namely affect, cognition and behaviour. Beliefs toward e- learning were examined from the viewpoint of the importance of web to instructor, design of content, constructivist approach and personal preferences. On the other hand, the external variables included the barriers faced by faculty members and demographic factors. The barriers were classified into organizational barriers, technological barriers, and social barriers. In addition, three demographic factors namely gender, experience in using computer and attending workshops were found as critical factors that might influence the utilization of JUSUR LMS. The study concluded that not

only the provision of required infrastructure but the successful integration of technology in teaching and learning processes by all faculty members only could guarantee the optimal implementation of LMS (Asiri, Mahmud, Bakar & Ayub, 2012).

How the Usage of Learning Management Systems Influences Student Achievement

The authors of this paper mainly focused to explore the predictors of adoption by students of a Learning Management System (LMS) based on a Modular Object-Oriented Dynamic Learning Environment (MOODLE). They also wanted to know the influence of active student participation and the interactive usage of an LMS on the achievements of students in a blended learning environment. This study was conducted on 169 students, who are using an LMS for the first time in their studies from the largest university from Serbia. The findings indicate that students' active participation in class has a stronger positive effect on students' achievement than does students' interactive usage of the LMS. A stepwise linear regression analysis revealed that students' interactive usage of the LMS and their active participation in class accounted for 47% of the variation in a student's achievement. A student's interactive usage of the LMS is only affected by his/her perceived easy usage of the LMS (Mijatovic, Cudanov, Jednak & Kadijevich, 2012).

A Study on the Impact of Learning Management Systems on Students of a University College in Sultanate of Oman

This study has been conducted at Muscat College to evaluate the impact of e-learning technology as the University colleges in Oman have introduced the latest e-Learning Management Systems in order to keep the pace of the technological revolution in the field of higher education. A questionnaire containing 25 items was prepared and circulated to the students enrolled for various Bachelor (Honours) degree courses of affiliated partner, University of Stirling, UK. This study examined what impact LMS has made on students and how effectively LMS has influenced students on their academic activities. The findings clearly showed the positive impact of LMS on students. There was a clear indication of the improvement in the learning skills of the students after they have started using LMS properly. The research study concluded that LMS had been very beneficial to the students at Muscat College (Nair & Patil, 2012).

The Effectiveness of E-LMS on Performance of Indian Rural Schools: A Case from a Developing Country

This study aimed to know the facts and effectiveness of Electronic Learning Management System (E-LMS) among the school students. Survey, comparative analysis and interview methods were used in this study. The author strongly argues that E-LMS is one of the most important strategies for learning. It determines how best the available technology resources can be utilized to enhance student learning. He further argues that E-LMS has the ability to document the academic performance of the individual student. Major findings from the study were: E-LMS significantly influence the students and teachers. The absenteeism ratio has declined due to the use of E-LMS. This in turn reflected in the academic performance of the students since they have no other option than sustaining with the learning activities. Overall performance of a student was also significantly increased. The effectiveness of E-LMS may be improved from the points of reporting in regional languages when exist, web-based reporting, and interactive communication. The study concluded with a remark that as the system has positive impact among the students, this will prove very effective when implemented in large scale in India (Arulchelvan, 2012).

Learning Management Systems (LMS) among University Students: Does It Work?

This article brings an insight about the LMS usage among university students. According to this article, Learning Management System (LMS) has been established in a number of universities worldwide to connect students and teachers without the confines of the traditional classroom. It is an environment with digital software which is designed to manage user learning interventions as well as deliver learning content and resources to students. Since the LMS system has already been implemented and it has also been made compulsory for the teachers to apply in their daily lectures, it is vital to identify feedback of students as users of LMS. In this modern world where information is disseminated quickly via the internet, the LMS is an essential tool for university students as not they can keep updated with their coursework but get instant notifications pertaining to their daily assignments. In turn, teachers have an easier time reaching out to their students out of class hours and can instantly update them over the LMS about issues regarding their coursework. The wide usage of internet among students and teachers and the academic

performance of students were clearly discussed in this paper, and the authors claim LMS as a suitable online portal to enhance the learning environment among university students. Authors of this article further claim that universities should provide proper training and guidance for students and teachers using the LMS, as well as have a team which is on-call at all times to solve any technical problems that may arise. Nevertheless, most university students have access to their university's LMS or similar systems that help to enhance their learning process, and LMS is considered as a necessary implementation in all universities worldwide (Adzharuddin & Ling, 2013).

Engineering and Computer Science Teachers' Use of LMS

This study focused on teachers' use of LMS in the school of Computer Science and Engineering at Reykjavik University, Iceland. To get clear view of how teachers in these schools use the LMS, all courses were examined at the end of spring semester, 2011. The results show that there was only slight variation between the uses of the LMS options in the different courses of the two Schools. Teachers were using most of the options they were supposed to use. Options that are not obligatory were not used as much and some options were rarely used. The teachers were mainly using traditional options to distribute material and receive students' assignments but not options like online exams and forums which give new opportunities for online cooperation and interactive communication. The results show that there was only slight variation between the uses of the LMS options in the different courses of the two schools. Some options in the LMS were commonly used, but others like syllabus were not. The authors further argued that many of today's students have good digital skills but the teachers were not in line with them (Matthíasdóttir & Stefánsdóttir, 2014).

2.2 STUDIES RELATED TO LEARNING STYLES

The Impact of Students' Preferred Learning Style Variables in a Distance Education Course: A Case Study

The author studied the impact of learning style variables in a live teleconference distance education class. The purpose of the study was to examine the influence of students' learning style preference in an on-campus or distance education remote

classroom, on student achievement in the following areas: course content, course completion rates, and attitudes about learning. Both distance and on-campus groups were taught simultaneously by the same instructor, received identical course content, and both groups met weekly. In this study, Canfield Learning Styles Inventory (CLSI) was administered. Students in the distance learning class who possessed a more independent and conceptual learning style had the highest average scores in all of the student achievement areas. People with the lowest scores in student achievement in the distance learning course had a more social and conceptual learning style. Students with both a social and applied learning style performed much better in the on-campus class. The outcomes of the study suggested that successful distance education students favored an independent learning environment while successful on-campus students showed a preference for working with others (Gee, 1990).

Learning Style Perspectives: Impact in the Classroom

An important question was raised by the author in this study: "Are there differences in learning styles between students who enroll into a distance education class and their equivalent on-campus counterparts?" He further inquired that if there are no differences in learning styles then it is likely that faculty can transfer the same types of teaching/learning activities that have been successful for them in the traditional environment, into the distance setting with similar success. This study further suggested that sufficient sensitivity has been given to student learning styles in the first place, and that sufficient thought has been given to how these methods will be transferred to the distance education environment using current communication technologies. If there are differences in learning styles between groups of students, then faculty must use learning style information to aid their planning and preparation for delivery of distance education activities. The author concluded that instructors should be willing to change their teaching strategies and techniques based on an appreciation of the variety of student learning styles. Teachers should try to ensure that their methods, materials, and resources fit the ways in which their students learn and maximize the learning potential of each student (Sarasin L. C., 2006).

Learning Styles and Online Education

The purpose of this paper was to recognize that individual learning styles must be taken into account in the instructional design template used in online education. The author argues that when students' learning styles are identified, it is possible to define an appropriate context of learning. This paper identifies a set of instructional principles for online learning environments that are derived from multiple theories of learning with a consideration of different learning styles. The VARK questionnaire was used to determine learning styles of students who participated in two online courses. The VARK instrument identifies four distinct learning styles: visual (V), auditory (A), reading/ writing (R) and kinesthetic (K). These four dimensions were used to analyze the appropriateness of online learning structures.

The result indicates that students with the auditory learning preference do not select online education as their first choice for learning. The combination of different techniques can make it possible for students with all types of learning styles to be successful in an online course. The paper concludes that the achievement of online learning can be improved by providing instruction in a manner consistent with each student's learning style. However, it is important to keep in mind that even if a specific student learns best in a certain way, then the student should be exposed to a variety of learning experiences to become a more versatile online learner (Zapalska & Brozik, 2006).

Do Gender and Learning Style Play a Role in How Online Courses should be designed?

In this study, Kolb Learning Style Inventory was used to identify differences between the learning styles of 168 students in traditional face-to-face courses and students in matched courses taught online. A total of 102 females and 66 males participated in the research study. Additionally, the data for the online courses were divided by gender to determine if gender was a factor. Results of the analysis found that there was a difference in the learning style of the online student and the student in the face-to-face course and that gender was a factor in the relationship between learning style and student engagement. The implications for online course designers were also found to be significant. The study concluded with a suggestion that when designing online courses the learning style and gender of all students must be considered (Diana & Barbara, 2010).

The Effects of Learning Styles and Gender on the Academic Performance of Interior Architecture Students

This study focuses on design education using ‘Index of Learning Style’ (ILS) and explores the effects of learning styles and gender on the performance scores of interior architecture students. This study was conducted with a sample of 100 students (25 male and 75 female; age range 19-27 years) in the Department of Interior Architecture and Environmental Design at Bilkent University. The learning styles of the students were determined using ‘Index of Learning Style’ (ILS) of Felder and Solomon (2004) that contains 44 items. The ILS consists of four scales, each with 11 items: active-reflective, sensing-intuitive, visual-verbal, and sequential-global. According to ILS, the usual methods of interior architecture education address a well - balanced class position in active/reflective and sensing/intuitive scales. A moderate to strong preference in visual scale and a weak preference in global scale were observed. Furthermore, in the two-way analysis significant effects were obtained between the individual interactions of active/reflective scale with the other three scales when the academic performance score was the dependent variable. In this study, it was found that learning styles and gender were independent for design students on all scales. Therefore, the design education should provide the opportunity to employ different learning scales. The important point conveyed through this study was to provide various learning experiences that emphasize different learning scales during design process. This study concluded that design instructors can relate learning scales to the specific conditions during the design process. Furthermore, increasing design instructors’ awareness in learning scales might lead to increase flexibility of teaching styles and enhance communication between instructors and design students (Demirkan & Demirbaş, 2010).

Impacts of Learning Styles and Computer Skills on Adult Students’ Learning Online

This study investigated the influences of learning styles, prior computer skills and experience with online courses on adult learners’ knowledge acquisition in a web-based special education course. Forty -six adult learners who enrolled in a web-based special education course participated in the study. Instruments used in this study include a background information survey, the VARK questionnaire, and Self-Evaluation of

Technology Use Survey. The results of the study showed that (a) learning styles had significant effects on adult students' knowledge acquisition, and (b) there is a moderate positive correlation between computer skills and students' success. Data analysis also showed that there is no relationship between prior experiences with online courses and success in a web-based course (Rakap, 2010).

Learning Styles of the Health Services Management Students

The aim of this study was to determine the learning styles of the first-year students of the Health Services Management discipline from the Medical Science Universities of Iran during the year 2010 using VARK tool. The author surveyed 180 Health Services Management Students of the Medical Science Universities of Iran. Data collection was performed using VARK learning styles questionnaire, based on which the visual, aural, read/write and kinesthetic styles were determined. The results show that only 41% of the students preferred the single-modal learning style, while the remaining 59% of the students preferred using the multi-modal learning style. Also, a significant relationship was found between the performance of the students in the course and the single-modal and the multi-modal learning styles as well as between the education status and the multi-modal learning styles. The study concluded that majority of the students preferred the read/write and aural styles for acquiring information. The study also suggested that knowledge of the learning styles of the learners is a valuable skill in education which helps the instructor to better present the information and assist the learner for a more effective learning (Bahadori, Sadeghifar, Tofighi, Mamikhani & Netaji, 2011).

Comparison of Preferred Learning Styles for International and Domestic Undergraduate Engineering Students

The VARK test was administered to undergraduate engineering students in both the Middle East and the United States (105 from the Middle East and 5228 in the United States), and comparisons were made between the proportion of each population falling into various learning style classifications. Findings indicate significant differences in the proportion of students in each population who demonstrate a mono-modal preferred learning style for auditory learning; among students in the Middle East, 21.9% are

classified as auditory learners, compared to 11.4% of Americans. Read-Write learners were less common in the Middle East (3.8%) than in the United States (12.9%). Students in the Middle East also exhibited a significantly higher proportion of students with no particular learning style preference (i.e., classified as “VARK” learners) 50.5% compared to 41.7% in the United States. The implication of these findings are that in cases where the American model of university education is being exported to engineering programs at universities or in situations where international students enroll in engineering programs in the United States, instructors may want to consider tailoring expectations, learning activities, and assessment tools to account for local variations in preferred learning styles (Wait, Nichols, & Zatar, 2011).

Visual, Auditory, Kinesthetic Learning Styles and their Impacts on English Language Teaching

The purpose of this study was to increase faculty awareness and understanding of the effect of learning styles on the teaching process. The author undertook this study as an analysis of learning styles for Iranian EFL university students. In order to understand the learning preferences of Iranian EFL university students, Perceptual Learning Style Preference Questionnaire (PLSPQ) was used. Over 100 students participated in this survey and completed questionnaire to determine if their learning styles are auditory, visual or kinesthetic. From the results, it was indicated that about 50% of the students preferred visual learning style, 35% of the students preferred auditory learning style, 15% of the students preferred kinesthetic style for their learning, and hence implied that Iranian EFL university students’ preferred learning style was visual. The study further suggested that in order to help students learn, teachers need to teach as many of these preferences as possible. Teachers can incorporate these learning styles in their curriculum activities so that students are able to succeed in their classes (Gilakjani & Ahmadi, 2011).

Assessment of Preferred Learning Styles

This paper presents the survey results on form four secondary school students to determine the most dominant learning styles preferred by the respondents according to four dichotomous Solomon-Felder learning dimensions. In the year 2008, six schools in the state of Selangor and the Federal Territory, Malaysia were involved in the study.

Richard Felder and Barbara Solomon Inventory of Learning Styles (ILS) containing 44 questions were used. A total of 145 respondents (93 female and 52 male students) participated in the survey. The results showed greater equilibrium between active/reflective and sensing/intuitive domains. However, the respondents are more biased towards visual than verbal and sequential than global domain. According to gender, somewhat contrasting preference between male and female respondents were observed. Non-science students were able to achieve better equilibrium between learning styles than Science students. The results of the study could serve as the initial guide in developing more conducive and effective teaching-learning atmosphere in the class (Tapsir, Rahman, Saat, Wahab, Boon, Ahmad & Mahmood, 2012).

Learning Styles among Mechanical Engineering Students

This research aims to look into the differences in learning styles among Mechanical Engineering students from different institutions and levels. The Barsch Learning Style Inventory is used to study the ability and method to process, analyze and store the information received. Learning style is viewed as a method of education that is particular to personal study experiences to achieve the best and deep learning results. In this study, Mechanical Engineering students from diploma and degree levels from INTI International University, Tunku Abdul Rahman College and Nilai University College, Malaysia were selected as samples (166 students from diploma level and 78 from degree level). The results show that majority of the engineering students (68.44%) in the study possess a visual learning style. Most of the degree level students have shown a single learning style (80.55%) as compared to students in Diploma (61.55%). The authors elucidate that understanding of these learning styles will help the teachers in designing and delivering the course material. The authors further added that analysis of learning styles of the students provides an opportunity to look into the learning style distribution for students in various disciplines in the engineering courses (Koh & Chua, 2012).

An Analysis of Students' VAK (Visual, Auditory, and Kinesthetic) Learning Style and Strategies in English Speaking of Second Grade at SMA Unggala Sidoarjo

The study discusses two major concerns; First, to find out students' learning style, whether they are visual, auditory, or kinesthetic, and Second, to find out strategies used

for students who are visual, auditory, and kinesthetic learners in English Speaking. The method that used in this study was Questionnaire, Observation, and Interview. Questionnaire used by researcher was Learning Style Survey by Rebecca Oxford 2001. The results show that visual learners were 67%, auditory learners were 10% and kinesthetic learners were 23%. As a result, the visual learners were more dominant than kinesthetic and auditory learner in second grade. Visual learners often do not remember information given orally without being able to see it. They memorize using visual clues. Visual learners remember something better if they wrote down and visualize picture, word or number in their head. Visual learners use color coding to help them learn something. Auditory learners were able to say something without paying close attention to the person said to them. Kinesthetic learners learn best by moving their bodies, activating their large or small muscles as they learn. They are "hands-on learners" or "doers" who actually concentrate better and learn more easily when movement is involved (Yuliyani, 2012).

Learning Style Preferences of Iranian EFL High School Students

The current study examined the learning style preferences of 75 Iranian students at Marefat high school in Kuala Lumpur of which, 41 are female and 34 are male. As there were very few researches in which the learning style preferences of Iranian high school students investigated, this study attempted to fulfill this gap. In this study, Reid's Perceptual Learning Style Preferences Questionnaire was used in order to identify the students' preferred learning styles (Visual, Auditory, Kinesthetic, Tactile, Group, and Individual). Results indicated that the six learning style preferences considered in the questionnaire were positively preferred. Overall, kinesthetic and tactile learning were the major learning styles. Auditory, group, visual, and individual were minor (Vaseghi, Barjesteh & Shakib, 2013).

Relationship between VAK Learning Styles and Problem Solving Styles regarding Gender and Students' Fields of Study

This study aimed to identify VAK learning styles and problem solving styles of students, to check the relationship between these and to investigate the differences in the above-mentioned styles between male and female students and their fields of study.

To this end, 102 students were selected through convenient sampling from Boushehr Islamic Azad University (Iran). Reid's learning style and Cassidy and Long's problem solving style questionnaires were administered to the sample. The data gathered were subjected to the statistical procedure of Pearson Product Moment correlation, two way repeated measures ANOVA, and Independent sample *t*-test. The results indicated that there is a positive relationship between VAK learning styles and problem solving styles. The results also showed that fields of study did not have an effect on VAK learning styles and problem solving styles. Further, it was found that gender has no effect on VAK learning styles, but it has an effect on problem solving styles (Gholami, 2013).

Should Teaching and Learning Styles Match?

In this study the learning styles preference of forty-five students were assessed and divided them into groups based on their learning preference. Each group was then made to complete 4 assignments each highlighting one of four learning preferences (auditory, visual, tactile, and kinesthetic). Forty-five Educational Psychology students from a Mid-size Mid Western University participated voluntarily in this study. The Barsch Learning Style Inventory (BLSI, Barsch, 1996) consists of 32 statements that elicit self-diagnostic responses using a 3-point Likert-type scale, 1 (seldom) to 3 (often) was used. Results indicate a learning style preference in one of the four areas: visual preference, auditory preference, tactile preference, and kinesthetic preference. Students may have equal strengths in two or more groups which indicate they can use any of the senses for learning tasks and are therefore identified as exhibiting multimodal learning preferences. Group scores on each assignment showed that designing assignments to match students' learning styles does not lead to better performance but active learning positively relates to overall learning. Results also show that students preferred assignments that matched their particular learning styles (Rinaldi & Gurung, 2013).

The impact of undergraduate students' learning preferences (VARK Model) on their language achievement

The main goal of this study was to investigate the impact of undergraduate students' learning preferences on the language achievement. The participants were selected from the Departments of Humanities, Basic Sciences Engineering and Life

Sciences. From each department, 30 students were selected through convenient sampling. Two instruments (VARK questionnaire and standardized proficiency test) were administered on the selected participants. The results indicate that reading style is the dominant learning style among the students, and there was a significant relationship between learners' field of study and their learning styles. Also, students with reading style have the highest language achievement, and the students with visual personality type have the lowest performance. The study also indicates that 25% of the Engineering students prefer kinesthetic learning style (Moayyeri, 2015).

Individual Differences considering Students' Learning Styles

This paper aims at the importance of knowing the learning styles of the students on the part of the teachers to build on their teaching methodology according to them. The paper also offers overall information on learning styles, their categorization and suggests helpful techniques for teachers to adopt their teaching style to the students' learning style. An emphasis is put on the idea that there exist no strict rules and rigorous distinctions between them or completely pure styles. The study is carried out through a detailed study of the existing theoretical literature on the topic and on the interviews and classroom observations conducted with the students on the same issue. A questionnaire with some questions based on VARK Model was also used in this study. There were 60 students and teachers. The author strongly argued that every student is unique, thus their learning styles are also different. Students with a learning style preference will learn more effectively if the learning process is guided according to their preferred learning style. Despite the variety of terms used for naming the learning styles as identified during the research work, it is crucial that teachers, instructors and even the learners value these styles as one of the factors that affect successful teaching process. The paper comes to the conclusion that individual differences on learning styles affect a lot, the teaching methodology of the teachers (Myftiu, 2015).

2.3 STUDIES RELATED TO LMS & LEARNING STYLES

Analyzing the Behavior of Students in Learning Management Systems with respect to Learning Styles

In this study, the authors expressed their concern about the improper usage of LMS in e-education. They argued that though LMS is successfully used in e-education,

same course materials are only provided to all learners not considering the learners' individual needs. As a requirement for taking learning styles into consideration in LMS, they analyzed the behavior of 43 students during an online course within an LMS with respect to their learning styles. Their investigations were based on the learning style model by Felder and Silverman. They focused on two major issues: they examined whether learners with different learning style preferences act differently in the online course. The results show the different preferences and needs of students with different learning styles. Secondly, they investigated correlations between the learning style preferences and the behavior of the students in the course. From these correlations, it is not only possible to draw conclusions from learning style preferences to the behavior but also to obtain indications from the behavior of students about their learning style preferences. These results provide information which can be used to investigate the identification of learning styles in LMS based on the actual behavior of students during an online course (Graf & Kinshuk, 2006).

Student Characteristics that Predict Persistence in Community College Online Courses

This study examined the student characteristics of learning style, locus of control, computer experience and access, and online course experience on persistence of community college students in online courses. An online survey instrument based on the Barsch Learning Style Inventory (1996), the Abbreviated Measure of External Locus of Control (1974), and a Computer Experience Scale that was developed by the researchers were completed by 225 students enrolled in online courses at five Florida community colleges. Logistic regression analysis identified a three-variable model (auditory learning style, grade point average, and basic computer skills) that was significant in predicting online student success. The results indicated that auditory learning style was a significant predictor of community college student online persistence. The analysis indicated that an increase in auditory learning style was associated with an increase in course withdrawal. Auditory learners are people who are better at processing verbal than written information. Much of the online course environment is structured so that students receive information in a written format. Students who are auditory learners may not be able to comprehend online course material as well as students with other types of learning styles. The authors recommended that community college administrators be proactive in identifying students

who may be at risk for persisting in online courses. Specific to assisting their success in online courses, these resources could include orientation that familiarizes them to the online environment, online tutorials, or help desks that these students can utilize when they begin to experience difficulty in the online environment (Ivan & Beverly, 2011).

Group Characteristics and Learning Styles: An Interpretive Case Study

This study aims at providing strategies for blended learning situations which combine supervised on-line courses with traditional classroom lectures in order to take into account the different learning styles of particular groups of students. This research proposed that commonly preferred learning styles and learning towards certain media presentations can be identified in whole groups that share some common group characteristics. An interpretive case study was chosen as the methodology to reach the research goal. The students, who participated in this study were majoring in Science, Social Science, or Management. Various data collection techniques included a survey of 576 students who studied IT courses, personal interviews of 34 students, participatory and on-line observations, and reference to institutional documents. The research discerned that students in specific major academic fields have common preferences for on-line media and activities that assist the learning process because they process and perceive information differently. A model is proposed to identify the interactions between the learner, the media and activity content, and the context of learning. The design of on-line course materials should take into account group learning styles to propose a holistic picture for effective learning. This is a valuable resource for the teachers and designers of compulsory on-line courses and for those who determine educational policy and strategy (Tongkaw, 2011).

A Study on Users of MOODLE through Sarasin Model

In this study, the impact of MOODLE, a Learning Management System, on learning community in the teaching- learning process was evaluated and the learning styles preferred by the students were investigated. The difference in learning styles according to the gender was also investigated. This study considered the parameters provided in Sarasin model on a sample size of 160 students. The results of the study point out that, students learn much from the visual and kinesthetic learning through MOODLE than auditory

learning and there is no difference in learning according to the gender. Further, an insight was provided to develop e-lms with available web 2.0 tools to incorporate collaboration and socialization into the teaching- learning process (Dominic, Philomen, Francis, & Nicholas, 2013).

2.4 OTHER RELATED STUDIES

Students' Attitudes toward E-learning in Kuwait's Higher Education Institutions

This paper presents an overview of students' attitudes towards e-learning in Kuwaiti Higher Education. The investigation was conducted at the College of Business Studies (CBS), a government sector, at which e-learning had not been previously used, and at the Gulf University for Science and Technology (GUST) representing the private sector. A study was carried out to examine students' attitude towards e-learning, and data was collected using a questionnaire which was applied for students in both sectors. The study results indicated that the students in both sectors were keen to use e-learning and there are some significant differences between male and female students in their attitudes towards the use of e-learning materials. The authors recommend that the results of this study will benefit higher education institutions in Kuwait and other Muslim countries in the region in determining how to use ICT for appropriate e-learning in teaching Information Technology and other subjects in a culturally acceptable way (Eisa, Goodwin, & Al-Hunaiyyan, 2008).

Barriers in Adopting Technology for Teaching and Learning in Oman

This study investigated the perceived barriers in adopting information and communication technologies (ICT) in Omani higher education. A total of 100 faculty members from 4 different departments at the College of Applied Sciences (CAS) in Oman participated in the study. The participants took a survey which was developed based on the Western literature. Five factors were extracted from the survey: lack of equipment, lack of institutional support, disbelief of ICT benefits, lack of confidence, and lack of time. The findings showed that the faculty members perceived moderate degrees of barriers in applying ICT to their teaching practices. Group differences based on gender, academic rank, and academic field were generally not found except for the interaction effects on the barriers related to lack of equipment, disbelief of ICT benefits,

and the overall mean. Male faculty members with less usage of ICT perceived more barriers regarding the lack of computing equipment, disbeliefs of ICT benefits, and the overall barrier than the female counterparts.

Important implications of this study include a need to provide more institutional support, technical training, and personal time for faculty members to learn and upgrade their knowledge and skills in educational technologies. This study showed that the faculty members at CAS overall were dissatisfied with the technology adoption in their teaching practices. The two areas the faculty members complained about most were lack of time and lack of institutional support including technical support. These findings provide hints for CAS to effectively support the professional development of its faculty members in adopting technology in the teaching practices. It seems that the critical measures at CAS would be to establish a close collaboration between the technology experts and teaching personnel, provide more technology training, and allocate more time for faculty members to learn and upgrade their technology knowledge and skills (Al-Senaidi, Lin, & Poirot, 2009).

The Comparison of the Opinions of the University Students on the Usage of Blog and Wiki for their Courses

The purpose of this study was to investigate the use of blogs and wikis as constructive tools in the computer courses of teacher educators and compare them with respect to perceived usefulness, perceived ease of use, intention, self efficacy and anxiety. Ninety-two students who were enrolled in various teacher education programs used blog and wiki for their courses. After their experiences with blog and wiki, the data were collected by administrating the instrument developed by the researchers. The results showed that students were positive to blog and wiki usage in the teaching -learning process. However they found wiki more useful. Both perceived usefulness and self-efficacy variables explain 71% of blog and wiki usage. This value points to a very high and significant correlation. Perceived usefulness has been identified as the variable that could explain intention by itself at the most. The results of the study revealed that when the blog and wiki were compared in terms of perceived usefulness and anxiety, significant differences were found in favor of wiki. However, significant differences were

not found when the blog and wiki were compared in terms of perceived ease of use, intention, and self-efficacy. The results showed that students were positive to blog and wiki and they found wiki more useful (Avcı & Askar, 2012).

A Comparative Analysis of Student Performance in Paper Pencil Test (PPT) and Computer Based Test (CBT) Examination System

This paper focuses on the comparative analysis of student performance in CBT and PPT. Computer Based Test (CBT) is an assessment that is administered by computer or by other technology devices linked to the internet or World Wide Web (WWW). The Paper Pencil Test (PPT) is the conventional method of writing exams. A correlational analysis of CBT and PPT assessment method was used. This involves the use of questionnaire to collect data on the scores of students who wrote both CBT and PPT exams in 2013 and 2014. Pearson Correlation was used for the analysis. Results showed a positive correlation in the scores of student, and hence it is concluded that if students are well prepared for the CBT exams, their performance will be enhanced. It is also recommended that technological awareness provided for teachers and the students might increase the utilization of computer based test at the primary and secondary school level. (Oduntan, Ojuawo, Oduntan, 2015).

2.5 CRITICAL REVIEW OF THE STUDY

A critical review of the related studies has been used for identifying the research gaps in the area of the study. Many studies specified in the literature were dealing with LMS, its usage, effectiveness and wide application in the field of education. Similarly, Learning Styles and their incorporation with online learning were also explained comprehensively. Sarasin, L. C. (1998) presented a clear view on learning styles in the study entitled, "Learning style perspectives: Impact in the classroom". Very few studies like 'A study on users of MOODLE through Sarasin model' (Dominic, 2013) and 'Analysing the Behaviour of Students in Learning Management Systems with Respect to Learning Styles' (Sabine Graf & Kinshuk, 2006) investigated the effect of incorporation of Learning styles and LMS in the classroom or virtual environment. The results of the studies revealed that incorporation of learning styles with LMS will definitely make learning a social, interactive, collaborative and more effective one.

2.6 NEED AND SIGNIFICANCE OF THE STUDY

Considering the theoretical justification presented in the first chapter and the review of related literatures presented above, usage of usability and accessibility features of LMS according to their learning preferences is the most common problem among engineering students. The thirst for digital expertise and the preference of learning make the students to look for easy, accessible learning technologies. The present study makes an earnest effort to study the usage usability and accessibility features of LMS and the learning styles.

Incorporating students' learning styles in the learning environment makes learning easier for them and increases their learning efficacy. Today's students are more self-directed, better prepared to grasp information, more reliant on feedback from peers and more inclined to collaborate, but still they need much more to quench their digital thirst. They want to be the active users of modern technological tools in their learning situation. Therefore, the importance of this research becomes more evident by taking into consideration the fact that there is a virtual platform called LMS, which caters to the needs of students with different learning styles in the digital environment.

It is also to be pointed that the present study is different from other studies in several aspects. This study is more focused towards learning through LMS. Furthermore, this study can provide recommendation for students that usage of technology tools will make learning more conducive and enjoyable. At the same time, this study can also provide ideas and techniques of teaching methods suitable for the present digital world.

2.7 CONCLUSION

Review of the related studies helped to critically analyze the needs and problems of students towards the usage of LMS features and their learning preferences. The research methodologies direct to carry out the research to find the solution of the problem. The research methodologies used are presented in chapter 3. The results are interpreted and discussed in chapter 4 and chapter 5 respectively.