

An Investigation of the Relationship between Learning Management System and Learning Outcomes: Mehralborz Virtual University Case Study

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Abstract- Learning management systems (LMS) used in virtual universities have profound impacts on multiple aspects of university students' lives. Aim of this paper is to investigate the impact of university student LMS engagement from a pedagogical stand point and to survey the relationship between LMS engagement and learning outcomes according to the view point of Mehralborz virtual university students. According to the literature and Bandura's social learning theory some hypothesis were driven and a questionnaire was acquired in order to survey hypothesis. Pearson Correlation test was used by SPSS software to analyze paper's hypothesis. According to literature three dimensions of learning outcomes (cognitive, affective and skill-based) were considered and since this study is focused on social aspect of learning, university students' self-esteem, satisfaction with university life and performance proficiency were specified. Results demonstrate direct influence of university students' LMS engagement on their learning outcomes.

Keywords- *Learning Management System, Learning Outcomes, Social Learning Theory*

I. INTRODUCTION

Information Technology (IT) has made changes in individuals' learning. Distant learning is one change made by IT. Today, People are able to economize their time and omit any kind of limitations using distant or virtual learning. According to this point many virtual universities and institutes are offering services to individuals. No necessity to attend in classroom and ability to learn in any time and place are other reasons of virtual university and institute expansion. Considering changes made by IT on individuals' learning style, e-learning is more important subject. Universities and institutes have influence on e-learning using Learning Management System(LMS). By LMS, electronic learning material, registration and assignment is managed. A virtual university uses LMS in order to share learning material, provide an opportunity for students to contact with their teachers and peers and share their knowledge with others. Electronic learning is a virtual learning environment in which learner is related to

learning material, peers and teachers by using information and communication technology (Alavi, M., Leidner, D. E. , 2001)

Today, LMS in virtual universities is a kind of stage for individuals to present themselves and have a different and virtual relationships with others more than friendship they had before. Using LMS helps students to be related to a variety of information sources and improve their information level (Wasko, M. M. , & Faraj, S. , 2005). The relationship between LMS and e-learning is investigated in this study using social learning and learning outcomes and also importance of LMS on university students is understood.

In a pedagogical evaluation, learning outcome is something that usually gets measured. According to the literature, Learning Outcomes has three dimensions: Cognitive, Affective and Skill-based. In order to investigate the relationship between LMS engagement and students' e-learning, Self-esteem, University life satisfaction and Performance Proficiency are selected to reflect three dimensions of learning outcomes.

Bandura (1986) in his social learning theory mentioned that three elements including individual learners, peers and situations potentially affect individuals' learning outcomes. In an online social network such as Learning Management System individuals are in touch with a large capacity of information and can express themselves, start new relationships and interact with peers and situations.

II. THEORETICAL DEVELOPMENT AND HYPOTHESIS

This study is based on Bandura's (1977) social learning theory. Bandura believed that personal items such as beliefs, expectations, views, knowledge and etc, environmental events such as physical and social events and also individuals' behavior with each other has reciprocal influence and none of them are apart from the others in individuals' behavior. This theory believes that individuals learn by observing others' behavior.

Social learning theory emphasizes on self-regulation of individual learning and shows that individuals self-initiate,

regulate learning and actively make knowledge by acquiring, generating and structuring information. Self-regulation is generating and guiding ideas, interests and behaviors by individual in order to reach to the aim (Santröck, J. W., 2004). Greene et al (2007) mention however there are differences between scientists' beliefs on self-regulation, but all of them believe that self-regulation learners are active and regulate their learning effectively.

Furthermore this theory emphasizes on learning and a social process in which individuals interact with peers and with situations. According to social learning theory, individuals need support from society and understanding of the situations, however, Individuals' self-directed active engagement functions as an initial motive for achieving desirable learning outcomes.

Kraiger merged previous theories and researches in a study and produced multiple dimension for learning outcomes (Kraiger, K., Ford, J. K., & Salas, E., 1993; Schmidt, A. M., & Ford, J. K., 2003). The dimensions are cognitive, affective and skill-based. The knowledge based cognitive domain is associated with intellectual learning, so cognitive domain of learning outcomes include comprehension, knowledge and application. The attitudinal-based affective domain is related to emotional learning, feelings, relationships and the ability to deal with situations. So affective learning outcomes include students' attitudes satisfaction and appreciation of the learning experience. The skill-based learning outcomes include the development of critical thinking and the technical skills to solve problems or perform tasks. As this study is concentrated on social aspect of learning, self-esteem, university life satisfaction and performance proficiency are chosen to reflect the cognitive, affective and skill-based domains of learning outcomes.

Based on literature and mentioned descriptions, concept model of this study is illustrated in figure 1 which shows the relationship between Learning Management System engagement and three dimensions of Learning Outcomes.

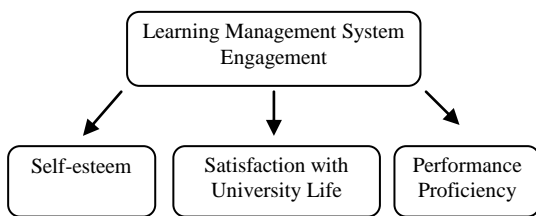


Fig. 1. Concept Model

Learning Management System engagement not only enables students to expand their network scope by connecting with various relationships, but also allows them to maintain close relationships with a small group of people (Yan Yu et al, 2010). The typical structure of individuals' online social network is in a way that an individual establishes various relationships with a large group of people while expanding closer relationships with core friends through close interactions. Individuals take advantage of their large range of

relationships and small group of close relationships by engaging in Learning Management Systems. Treisman's (1992) study shows that the time college students spend with their peers is a critical factor in determining their performance. In educational contexts, online social networking behavior such as LMS is related to learning and academic success by creating systems of information, contacts and support. Despite interactions in the classes, students need other channels to express their feelings informally and freely, establish specific friendships that may not be realized by offline interactions, and gain more information. These are important to students' mental health and performance improvement. Several studies have illustrated that university students with more engagement in online social networks such as Learning Management Systems are more likely to have better health, affective development and academic success (Morrow, 1999; Steinfield et al., 2008). Hwang et al. (2004) also demonstrate that college students' social network with peers and professors can cause gaining information and knowledge and giving them higher performance. So, it is hypothesized that:

- University Students' Learning Management System engagement is related to their self-esteem.
- University Students' Learning Management System engagement is related to their satisfaction with university life.
- University Students' Learning Management System engagement is related to their performance proficiency.

III. RESEARCH METHOD

In order to test our research model, we adopted a survey approach. Before main survey a focus group discussion was conducted and it helped research to improve its validity. Also using Cronbach's Alpha test was used to indicate the reliability of survey. An online survey among four majors (MBA, IT, Industrial Management & Project Management) of university was done and about 300 e-mails during two weeks were sent to students. Using Krejcie & Morgan table (Krejcie, R. V. & Morgan, D. W., 1970) at least 169 answers have to be gained that about 85% of answers were received. Five-point Likert scale was used in a questionnaire to measure the predicting variables and the specified learning outcomes. Five items related to the intensity of Learning Management System usage were adopted from recent studies (Ellison et al., 2007; Steinfield et al., 2008). It is common to generate measures for a specific culture (Morrison, 1993). Self-esteem was measured with 5 items which were developed by Rosenberg (1989), and further validated by Steinfield et al. (2008) in a university context. Satisfaction with university life was measured with 4 items that were adapted from Rode et al. (2005). Performance proficiency was measured on 4 items adapted from Chao et al. (1994). And also Pearson Correlation test was used in order to investigate the relationship between variables.

IV. RESULTS AND DISCUSSIONS

At first some descriptive Statistics included study level (from year 1 to year 3), gender (male or female), major (MBA, IT, IM, PM) and age were measured that results are shown in table 1.

In order to test the reliability of questions we used Cronbach's Alpha test that the results are shown in table 2. According to the table, as all Cronbach's Alpha are more than 0.7 it shows high reliability of our survey.

TABLE I. DESCRIPTIVE STATISTICS OF STUDENTS

	Study Level				Gender			Major					Age			
	Year1	Year2	Year3	Total	Male	Female	Total	MBA	IT	IM	PM	Total	20 to 30	31 to 40	41 to 50	Total
Number	65	51	28	144	78	66	144	69	42	12	21	144	109	33	2	144
Percent	45.1	35.5	19.4	100	54.2	45.8	100	47.9	29.2	8.3	14.6	100	75.7	22.9	1.4	100

TABLE II. CRONBACH'S ALPHA TEST

Variables	Number of questions	Cronbach's Alpha
LMS engagement	5	0.721
Self-esteem	5	0.761
Satisfaction with university life	4	0.804
Performance Proficiency	4	0.750

Description of variables including min, max, mean, Std. deviation and skewness are shown in table 3.

TABLE III. DESCRIPTION OF VARIABLES

Variable	Min	Max	Mean	Std. Deviation	Skewness
LMS engagement	1	4	2.21	0.687	0.580
Self-esteem	1	3.8	2.09	0.687	0.217
Satisfaction with university life	1	4.5	2.56	0.853	0.361
Performance Proficiency	1	4.25	2.53	0.767	-0.022

Kolomogorov-Smirnov test is applied in order to investigate if the distribution is normal or not. According to the Significance level of the variables shown in table 4, it is understood that the distribution is normal. So Pearson Correlation test is used to analyze correlation between our variables.

TABLE IV. KOLOMOGOROV-SMIRNOV TEST

Variable	Z Kolomogorov-Smirnov	Sig. Level
LMS engagement	1.253	0.087
Self-esteem	1.318	0.06
Satisfaction with university life	1.091	0.185
Performance Proficiency	1.345	0.054

Table 5 illustrates Significance Level and shows that there is relationship between predicting and criterion variables. Also Pearson's Correlation Coefficient shows that there is positive correlation between predicting and criterion variables.

TABLE V. PEARSON CORRELATION TEST

		Self-esteem	Satisfaction with university life	Performance Proficiency
LMS engagement	Pearson's Correlation Coefficient	0.381	0.584	0.426
	Sig. Level	0.001	0.001	0.001

V. IMPLICATIONS

Several implications are presented for the literature, education practices, and future research. The research model on the impacts of Learning Management engagement on learning accompanied by empirical validation contributes to the literature of social networking and social learning. It is observed that university students are interested in LMS, but there is a lack of knowledge about impacts of LMS, and how it influences individuals' learning from a pedagogical perspective. Results demonstrate that Learning Management Systems lead university students to whole person development with better psychological wellbeing and improved skills, revealing the positive impacts of LMS engagement on the social dimension of individual learning. This study proposes direct linkage between Learning Management System and social learning outcomes.

The social dimension of learning has always been of great significance to both individual learners and educational institutions. These days, the social behavior of human agency is changing (Bandura, 2002). From a university students' standpoint, findings of this study show positive impacts of individuals' LMS engagement on their learning outcomes. Indeed, it is found that university students' LMS engagement can promote their learning about peers and universities, and thus be beneficial for their self-esteem development, nurturing satisfaction with the university, and performance proficiency. This can support students in their "whole person" development for their future success.

VI. LIMITATIONS AND FUTURE RESEARCH

Several limitations are presented in this study suggesting the necessity for future research. First, we investigated correlation between LMS engagement and learning outcomes. As mentioned before, according to Bandura's Social Learning theory three elements influence on individuals learning (individual, peers, situation), so some socialization factors could be used as mediation variables in the study.

Second, Learning Management System of a virtual university was selected as the specific context and this treatment helps to reduce the complexity, but LMS intensity was as a proxy measure to present the online social networking engagement and it could help to make investigation on online social networking behavior.

VII. CONCLUSION

Learning Management Systems have deeply penetrated students' social life. Through the continuous innovation of web technologies, people are increasingly influenced by the virtual world. This study investigating the learning impacts of LMS engagement on university students demonstrates the critical role that such an emerging creative networking approach plays in education. Learning Management Systems facilitate university students to develop satisfying relationships with peers, as well as fosters integrity and commitment to their

universities, key facets of students' life in universities. Ultimately, Learning Management System can improve students' psychological well-being and skill development. This study implies that it is appropriate to utilize LMSs to design some learning activities to increase interactivity among individual students. These practices will help fulfill students' ever growing networking needs and, therefore, improve their social learning effectiveness.

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