Exploring Academicians Acceptance of E-Learning Using an Extended TAM: The Case of Yarmouk University

Emad Abu-Shanab

MIS Department, IT College, Yarmouk University, Irbid, Jordan

abushanab@yu.edu.jo

Laila Ababneh

Graduate Student, MIS Department, IT College, Yarmouk University, Irbid, Jordan

lailaahmed1234@hotmail.com

Abstract – The goal of this study is to explore Yarmouk University academic staff acceptance of E-learning. The study utilized the technology acceptance model (TAM) with an important extension. It is assumed that perceived usefulness, perceived ease of use, job satisfaction and age, are predictors of the intention to use e-learning system. The findings of this study showed significant positive relationships between perceived usefulness, perceived ease of use and intention to use E-learning. Unfortunately, age and job satisfaction failed to predict ITU e-learning. Based on the results a number of recommendations were proposed, and suggestions for future studies were made.

Index Terms – E-learning, LMS, Yarmouk University, Job satisfaction, TAM, Acceptance, Moodle.

1. INTRODUCTION

In a world that is in a constantly developing new information communication technologies (ICT), Internet technologies, and Web-based applications, in which they are offering untraditional ways of learning and teaching techniques, and making the learning process much better. Universities, and other educational organizations, found themselves forced to adapt with this rapid change and have to adopt the new trendy learning technologies so they can compete with others [1].

The research thrust was focused on student perceptions of e-learning and also in western countries. Thus this study comes for a need to probe academicians' perceptions regarding e-learning system adoption. Studies also that were conducted in the Middle East universities did not include all factors pertaining to adoption process. This study, will try to extend the robust technology acceptance model (TAM) with two major constructs that are hypothesized to influence adoption: age and job satisfaction.

Following is a short literature review that explores the e-learning concept, TAM, and related studies. Research method and research hypotheses are depicted in section 3. Finally, conclusions and future work are stated at the end.

2. RELATED WORK

E-learning can be defined as conducting learning activities via electronic media and using the Internet [2]. E-learning depends on self-motivated individuals to make it an effective way of learning. E-learning is defined also as the delivery of learning, education or training through electronic tools. It involves the use of a computer or any other electronic device (e.g. smart phone) or it can involve several types of equipment such as CD-ROM and DVD, which can be used to provide learning materials [3].

Using the multimedia made the learning process more active, interesting and enjoyable. Cost, service, quality and speed are believed to be the main constructs that define the shape of e-learning phenomenon. We can also define it as a tool that uses computer network technology, such as the Internet, intranets, and extranets, to deliver learning materials throughout the learning cycle [4].

2.1. The Concept of E-learning

E-learning plays a critical role in accessing, collecting, analyzing and transferring of information and knowledge across the educational organizations. Depending on its vital contribution with academic staff and students, e-learning improves the quality of teaching methods and learning management. These contributions were important reasons for increasing the popularity of e-learning in different educational institutions and organizations. Also, the continuous pressure on universities to cut costs through decreasing the number of the full time academic staff, and the considerable amount of effort made in the educational process, urged universities to find other methods that could save cost and effort. Universities needed to employ the concept of e-learning to save staff time and cost and improve the learning management process [5].

With the development of e-learning systems, the learning management systems (LMS) have become reliable tools in teaching and training available for academic organizations and universities. Even though the use of proprietary systems like Blackboard or ATutor provided the needed support and training for universities, some universities preferred to use open source tools such as Moodle or Dokeos. Such path (using open source systems) reduced further universities' costs of licensing, but incurred some extra burdens on university' Information System Departments (ISD) like supporting users and developing their own system customization.

Studies indicate that over than 90% of American universities offer academic programs through Learning Management Systems [6]. LMS also can be useful in the process of the development of student assessment in universities. In general LMS can manage all the operations of teaching and the learning processes, the registration operations, scheduling of plans, checking of the availability of the content, tracking the performance of the learner and sending reports about it, facilitating and enhancing the communication among teachers and learners (academic staff), through chat rooms, discussion forums, e-mail, and post files, and the assessment of tests and questionnaires [4].

On the level of LMS utilization in schools, and in a Jordanian context, two studies were conducted to probe teachers and students attitudes towards EduWave system implemented by the MOE in Jordan [7]. Results indicated that perceived usefulness and perceived ease of use significantly influenced the intention to use EduWave. On the other hand, when comparing the perceptions of teachers and students, results indicated a compatible view similar to students' results, with both type of subjects failing to support the role of trust in the process [8]. Furthermore, researchers emphasized the improvements that LMS systems contribute to the school environment and to the educational system [9]. Finally, social media can inflect some influence on students' performance where they spend more time and interact on social networks. Research indicated that social networks can be good (improve students' communication and collaboration, and social interaction), but also can be bad, where students may waste their time and neglect their assignments, exams and duties. Also, they may drift into addiction and social isolation (being more introvert that extrovert) [10].

2.2. Previous research

Many studies were conducted to explore the main factors that influence the adoption of LMSs in higher education (colleges and universities). Also, several models were proposed in previous studies that depended on famous models in technology adoption or extended their work into new ones. A study conducted in New Zealand showed that the e-learning development has two sides: content development and content delivery. Universities need to deal with these multiple factors if the system was to be successfully adopted. E-learning development is related to: individuals, systems, and organizational factors. The study revealed that the degree of knowledge and skills in online content design and development would strongly impact on the decision of academic staff to embrace this technology. It showed that there is a strong relationship between the IT literacy rate of staff and system acceptance; respondents with higher IT literacy are more confident in accepting this technology and those who would adopt the technology from the early stages of its implementation. Finally, the study concluded that people perception towards e-learning is a significant factor for system acceptance [11]. E-learning system would have a positive impact on the quality of learning and would also enhance the traditional teaching with improved flexibility for distance students.

Another study in Thailand examined the main issues affecting the implementation of e-Learning within universities. Results showed that there will be a need to engage in higher levels of e-Learning systems development in order to create an integrated e-Learning strategy for universities [12]. The study used data from a questionnaire on academic staff and suggested that e-learning is not widely used at university as it is perceived as less effective when compared to traditional practices (being widely used was perceived as most effective.)

A study utilized 212 responses from faculty members in an Art College in the Midwest in USA, investigated the factors that could predict the successful adoption and implementation of e-learning technologies in producing knowledge [13]. Analysis was performed to examine the effect of academic background and other demographic variables on the tendencies to adopt e-learning. The study concluded that the academic background did not yield significant correlations with the decision to adopt e-learning. Also, results showed that the decisions to adopt e-learning was influenced by faculty's self confidence in the use of the technology.

A study in Saudia Arabia aimed at identifying the attitudes of faculty members at Saudi Universities towards using LMS under the supervision of the National Center for E-learning, where a descriptive analysis was conducted to examine the research methodology [14]. Results indicated that there is a positive attitude towards LMS despite its lack of sufficient implementation and use. Results also showed an urgent need for training the academic staff on using LMSs features. Finally, no differences in attitudes towards using the system among the faculty members were attributed to gender or the type of college (humanities, art, engineering, scientific, and health).

In an attempt to highlight out the factors that influence the academic staff acceptance utilizing the following 5 factors related to teachers' competence: knowledge and skills, attitudes and values, teacher's personality, characteristics of students, and the field of study, and the acquired knowledge

and skills. The study was conducted in Jordan and targeted a population included all Jordanian public universities which implemented LMSs [15]. Results showed that there are many weaknesses in implementing LMSs in Jordanian universities and lead to two important recommendations for improvement: the group involved in developing the system need to be from diverse disciplines. Second, universities need to improve the quality of LMS management and standards. The results were compared to cases from European countries, where the author concluded that there are significant differences in the adoption level of e-learning implementation practices between European universities and Jordanian universities.

Another study on academic staff from several universities all across Jordan, and using a mixed model of the TAM and TRA, a random sample of 10 public and private Jordanian universities was used. Results indicated that there exists a positive relationship between perceived usefulness, perceived ease of use, computer knowledge- experience, and management support with the intention to adopt e-learning. On the other hand, a negative relationship between normative pressures, computer anxiety with the intention to adopt existed [6].

3. RESEARCH METHOD AND ANALYSIS

3.1. Research Model and TAM

Fred Davis [15] proposed one of the most famous and robust models in the technology acceptance domain (TAM). The main essence of TAM is that people's intentions to accept and use any technology is influenced by two variables; perceived usefulness and perceived ease of use. The two predictors were utilized in many research models later with different names and labels.

Perceived usefulness: it is an indicator of the degree to which the stakeholder believes that using a system has enhanced his job performance, or his group's or organizational performance [16]. In this study we will measure perceived usefulness as related to Moodle (Yarmouk University adopted LMS, YULMS) to show how it relates to the acceptance of the YULMS. Items were adopted from previous work in this area and adapted to the purpose of this study [6][8][17]. Previous research supported the relationship between perceived usefulness and the behavioral intention to use LMS by Jordanian academic staff at YU. The following hypothesis is stated:

H1: Perceived usefulness will have a direct positive influence on the intention to use of YU LMS.

Perceived ease of use: Users of any system will always be influenced by the ease of system's features when adopting such systems. The most user friendly systems are the most successful ones and easily adopted. This study will measure the perceived ease of use (PEOU) influence on the intention to use

YULMS by academic staff at YU. Davis [16] defined PEOU as the degree to which a person believes that using a defined system would be free from effort and extra load. Like PU, items of PEOU are adopted from previous studies and adapted to the purpose of this research [6][8][17][18]. Previous research supported a positive relationship between perceived ease of use and behavioral intention to use LMS. This study hypothesizes the following:

H2: Perceived ease of use will have a direct positive influence on the intention to use of YU LMS.

Job satisfaction: it was always introduced in research as a consequence of using LMS in any organization. In this study we hypothesized it as a major antecedence of accepting a technology. Such conceptualization is based on HR theories. Job satisfaction is significantly linked to workers' productivity [19]. Employees who are satisfied with their jobs or organization are more likely to accept new technologies offered by the organization and more likely to trust the vision of the organization [20]. Based on this, we state the following hypothesis:

H3: Job satisfaction will have a direct positive influence on the intention to use of YU LMS.

ICT studies always showed that younger people are being more willing to adopt ICT systems in general. Researchers suggested that the age variable is an important demographic variable that has either direct or moderating effect on behavioral intention and acceptance of LMS [21]. A number of studies have showed that by including, age as a moderator would increase the explanatory power of the TAM. Findings showed that within any educational context, the relationship between performance expectations in organizations was way much higher for younger employees. But also some studies failed to support this relationship [22]. For PEOU, the relationship with ITU was found to be stronger for older users, where ease of use may be a more salient factor for older users who may be facing confident issues in their ability to use LMS [21]. The following hypothesis is stated:

H4: Age will have a direct negative influence on the intention to use of YU LMS.
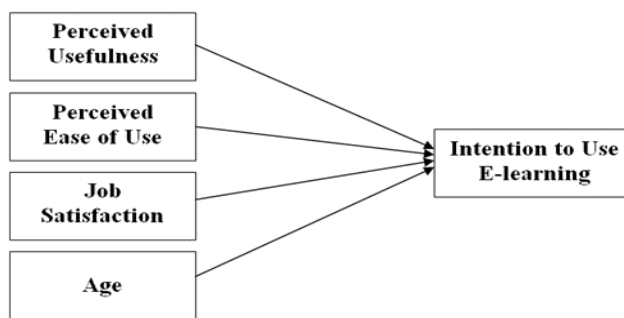

Figure 1: Research model

Based on the set of relationships assumed, we can conclude to the following research model that depicts these relationships and shown in Figure 1.

3.2.   Data analysis and discussion

This research tried to explore the factors that influence faculty members' adoption of YULMS. We used a survey that included 20 items to measure the research constructs. Such approach (empirical utilizing a survey tool) would allow for collecting data from a large number of respondents. The survey was distributed by hand to all faculty members who accepted to fill the survey voluntarily. The survey was written in Arabic language, as research indicated a significant influence for language on research results [23]. The survey utilized a 5-point Likert scale with 1 indicating totally disagree and 5 indicating totally agree.

The sample included 104 faculty members, where 64 worked in non-scientific colleges, and 40 worked in scientific colleges at Yarmouk University. The use pattern of respondents distributed as follows: rarely use YULMS (26 respondents, 25%), sometimes use the system (52 respondents, 50%) and always use the system (26 respondents, 25%). Other sample demographics are shown in Table 1.

Gender	Count	%
Male	78	75%
Female	26	25%
Total	104	100%
Rank	**Count**	**%**
Teaching Assistant	32	30.8%
Assistant professor	33	31.7%
Associate professor	17	16.3%
Professor	22	49.0%
Total	104	100%
Age	**Count**	**%**
Less than 25	0	0%
25-40	43	41.30%
more than 40-55	46	44.20%
more than 55	15	14.40%
Total	104	100%
Experience	**Count**	**%**
< 10 years	51	49.0%
10-20 years	34	32.0%
>20 years	19	18.3%
Total	104	100%

Table 1 Sample demographics

To check for internal consistency of measures, Cronbach's alpha was used. The results of this estimation yielded acceptable results for the following constructs: PU = 0.951, PEU = 0.961, JS = 0.609, ITU= 0.965. The only value that might need some improvement is the one for job satisfaction (recommended values >0.8, minimum acceptable values > 0.6).

To check for the bivariate relationships between variables, we used Pearson's correlations between all variables. Table 2

shows the results. Results indicate significant correlations among all independent variables and ITU except for Age. The other important indication in the table is the moderate correlations between all variables. Extremely high correlations might be accounted for tautological issue between independent variables.

This study utilized four independent variables and ITU as the dependent variables. Staff members perceived the four perceptional variables moderately according to a 5 point Likert scale (1.0-2.333 low mean, 2.333-3.666 medium, and 3.666-5 high), where the means for the variables were as follows: ITU mean = 3.44, PU mean = 3.25, PEOU mean = 3.28, and JS mean = 3.47. ON the other hand, and to test the hypotheses, we estimated multiple regression by regressing ITU on the four independent variables. Results yielded a significant model with a coefficient of determination value $R^2 = 0.526$ (adjusted $R^2 = 0.507$). The ANOVA test was significant with an $F_{4,104} = 27.478$, $p \leq 0.001$. This result means that we can explain 52% of the variance in Intention to Use E-learning. The coefficient table of regression is shown in Table 3.

Constructs	ITU	PU	PEU	JS	A
Intention to use (ITU)	**1**				
Perceived usefulness (PU)	**0.678****	1			
Perceived ease of use (PEOU)	**0.626****	0.660*	1		
Job Satisfaction (JS)	**0.088****	0.207*	0.252**	1	
Age (A)	**-0.117-**	-0.237-*	-0.150.-	-0.213-*	1

** Correlation is significant at the 0.01 level (2-tailed)

Table 2 Pearson's bivariate correlations

Model	Unstand. Coeff.		Stand. Coeff.	t	Sig.
	B	Std. Error	Beta		
(Constant)	0.994	0.668		1.487	0.140
Age	0.045	0.115	0.029	0.394	0.694
Perceived Usefulness	0.537	0.104	0.483	5.154	0.000
Perceived Ease of Use	0.348	0.097	0.335	3.587	0.001
Job Satisfaction	-0.174	0.139	-0.091-	-1.244	0.216

Dependent variable: Intention To Use (ITU)

Table 3 Coefficients table of multiple regression

4.   CONCLUSIONS AND FUTURE WORK

E-learning acceptance or success has become a major issue that every educational organization should be aware of. This study investigated the literature related to e-learning, and the studies related to the factors contributing to its success. We hypothesized that perceived usefulness, perceived ease of use, job satisfaction, and age will predict the intention to use e-learning. We focused our research on YULMS (Moodle based),

utilizing a sample of 104 faculty members at YU. Results indicated a significant prediction with 52% explanation of the variance in ITU (R2 value). Also, perceived usefulness and perceived ease of use were significant predictors of ITU at the 0.001 level, which supports hypotheses H1 and H2. This result is in alignment with previous research in this area [6][8][21]. Unfortunately, our results related to job satisfaction and age failed to support our hypotheses (H3 & H4). This result supports previous work calling age to be a moderator denying the role of job satisfaction to be a significant predictor [21] [21][25]. This research is the first to target the two predictors in Jordan. The major contribution was targeting YU staff, which yielded views of 104 respondents, and supporting the TAM. This study suffered from the small sample size, which might have affected results. Future work should target a bigger sample of YU academic staff. Also, more variables can be added, with an incentive for respondents to fill the survey as we suffered from the time devoted to filling the survey. Finally, improving the statements of survey items can improve research results.

REFERENCES

[1] Selwyn, N. (2003). ICT for all? Access and use of Public ICT Sites in the UK. Information, Communication & Society, 6(3), 350-375.

[2] Abu-Shanab, E. Ababneh, N., & Momani, A. (2012a). E-learning Systems' Acceptance: The Case of Eduwave in Jordan, The 8th International Scientific Conference eLearning and software for Education Bucharest, Romania, April 26-27, 2012, pp. 463-467.

[3] Hoskins, B. J. (2010). The Art of E-Teaching. Journal Of Continuing Higher Education, 58(1), 53-56. doi:10.1080/07377360903524641.

[4] Yung-Ming, C. (2011). Antecedents and consequences of e-learning acceptance. Information Systems Journal, 21(3), 269-299. doi:10.1111/j.1365-2575.2010.00356.x

[5] Harb, Y. & Abu-Shanab, E. (2009). E-learning Initiatives in Jordan: Pedagogical Evaluation of the Hashemite University E-learning System. A case study presented in the Proceedings of the 3rd Mosharaka International Conference on Communications, Networking and Information Technology, Amman, Jordan, 21-23 of December, 2009.

[6] Al-Alak, B. & Alnawas, I. (2011). Measuring the Acceptance and Adoption of E-Learning by Academic Staff. Knowledge Management & E-Learning: An International Journal, Vol. 3(2), PP. 201 -221.

[7] Abu-Shanab, E. Momani, A. & Ababneh, N. (2012b). Teachers' Adoption Of E-learning Systems: The Case of Eduwave in Jordan, The 2012 International Arab Conference of e-Technology (IACe-T'2012), Zarqa, Jordan, in April 25-27, 2012, pp. 51-56.

[8] Abu-Shanab, E. (2014). E-learning System's Acceptance: A Comparative Study, International Journal of Web-Based Learning and Teaching Technologies (IJWLTT), Vol. 9(4), October-December 2014, pp. 1-13.

[9] Hamam, S., Abu Abbas, O., Abdel-Qader, R., & Abu-Shanab, E. (2008). E-learning as Learning Method in Jordanian Primary and Secondary Education Environment. The Second International Conference & Exhibition for Zain e-Learning Center, Bahrain, 2008.

[10] Al-Tarawneh, H. (2014). The Influence of Social Networks on Students' Performance. Journal of Emerging Trends in Computing and Information Sciences. Vol. 5(3), March 2014, pp. 200-205.

[11] Nanayakkara, C., & Whiddett, R. J. (2005). A Model of User Acceptance of E-learning Technologies: a Case Study of a Polytechnic in New Zealand. In ISTA(pp. 180-190).

[12] James, P. (2008). Academic Staff Perceptions Of ICT And E-learning A Thai He Case Study. The Turkish Online Journal of Educational Technology – TOJET, Vol. 7(4), pp. 36-44.

[13] Kamali, A. (2012).Antecedents of Adopting e-Learning: Toward a Model of Academic e-Learning Acceptance Culture. Proceedings of the Information Systems Educators Conference New Orleans Louisiana, pp. 1-9.

[14] Hussein, H. (2011). Attitudes of Saudi Universities Faculty Members towards Using Learning Management System (JUSUR).Turkish Online Journal Of Educational Technology - TOJET, 10(2), 43-53.

[15] Altarawneh, H. (2011). A Survey of E-Learning Implementation Best Practices in Jordanian Government Universities. International Journal Of Advanced Corporate Learning, Vol. 4(2), pp. 9-17. DOI: 10.3991/ijac.v4i2.1627.

[16] Davis, F. D. (1989). Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology. MIS Quarterly, 13(3), 318–339.

[17] Abu-Shanab, E. (2012). The Digital Divide and Its Influence on Public Education Diffusion. International Journal of Technology Diffusion, Vol. 3(4), October-December 2012, pp. 36-47.

[18] Alharbi, S., & Drew, S. (2014). Using the Technology Acceptance Model in Understanding Academics' Behavioural Intention to Use Learning Management Systems. learning, Vol. 5(1).

[19] Yilmaz, B. (2013). Work Motivation Of Academic Staff That Work In The Field Of Physical Education And Sports. International Journal Of Academic Research, 5(6), 125-130. Doi:10.7813/2075-4124.2013/5-6/B.21

[20] Churchill Jr., G. A., Ford, N. M., & Walker Jr., O. C. (1974). Measuring the Job Satisfaction of Industrial Salesmen. Journal Of Marketing Research (JMR), 11(3), 254-260.

[21] Tarhini, A., Hone, K., & Liu, X. (2014). Measuring the Moderating Effect of Gender and Age on E-Learning Acceptance in England: A Structural Equation Modeling Approach for an Extended Technology Acceptance Model. Journal Of Educational Computing Research, 51(2), 163-184. doi:10.2190/EC.51.2.b

[22] Rothmann, S., & Barkhuizen, N. (2008). Burnout of Academic Staff in South African Higher Education Institutions. South African Journal Of Higher Education, Vol. 22(2), pp. 439-456.

[23] Abu-Shanab, E. & Md Nor, K. (2013). The Influence of Language on Research Results, Management Research and Practice Journal (MRP), Vol. 4(2) (2013), pp. 37-48.

[24] Keller, C., Hrastinski, S., & Carlsson, S.A. (2007). Students' Acceptance of E-learning Environments: A Comparative Study in Sweden and Lithuania. In Proceedings of the 15th European Conference on Information Systems, June 7-9, St. Gallen. .Switzerland, 395-406.

[25] Tarhini,A., Hone,K., & Liu, X. (2013).Factors Affecting Students' Acceptance of e-Learning Environments in Developing Countries: A Structural Equation Modeling Approach. International Journal of Information and Education Technology, Vol. 3(1),PP.54-59.

Authors

Dr. Emad A. Abu-Shanab earned his PhD in business administration, in the MIS area from Southern Illinois University – Carbondale, USA, his MBA from Wilfrid Laurier University in Canada, and his Bachelor in civil engineering from Yarmouk University (YU) in Jordan. He is an associate professor in MIS. His research interest is in areas like E-government, technology acceptance, E-marketing, E-CRM, Digital divide, and E-learning. Published many articles in journals and conferences, and authored three books in e-government. Dr. Abu-Shanab worked as an assistant dean for students' affairs, quality assurance officer in Oman, and the director of Faculty Development Center at YU.

Laila Ababneh: earned her bachelor in computer science from Yarmouk University and is studying her master in management of information systems also in Yarmouk University and in the MIS Department. Her research interest is in e-learning and social media.