Student's Web Based Learning Method using Technology Acceptance Model- A Study

Shaniba Fasal, Ranjini S.Nair
HCT-IT, Muscat Oman

Abstract: The motivation behind this paper is to identify the primary variables that impact the students learning through websites. In this study, the overview polls were controlled to a specimen of 180 students in a well reputed technical college in Muscat. The basic frame work of this study utilizes Technology Acceptance Model (TAM which is appropriately altered by consolidating some factors which is suitable for the objective of the exploration work). This study proposed a hypothetical structure that incorporates the center builds in TAM: namely, perceived ease of use, perceived usefulness, and attitude toward usage. Extra outer variables were likewise adopted -namely, skills and knowledge, interface and system accessibility. The observational discoveries of this study are valuable for colleges, Internet administrators, strategy creators etc. The factors analysis and regression analysis are used to assess this research model. The research model proposes that all said variables either specifically or by implication influence the general behavioral expectation to utilize the site learning. This study offers knowledge into learning through sites in Oman. Few studies are done on this point so its commitment will be noteworthy to the writing of web based learning The general model proposes that all said variables either specifically or by implication influence the general behavioral of the students to use the web based learning.

Keywords: Web-based learning, Technology acceptance model, perceived usefulness, perceived ease of use, E-learning.

I. INTRODUCTION

Electronic learning has advanced as a critical facilitator in instructing learning process. E-Learning includes the utilization of one or more instructive advances to overcome the boundaries of timing and/or area. E-Learning is the utilization of advanced innovation to encourage and improve learning and training. This utilization of innovation has turned out to be so essential in today's reality that colleges, universities, government associations, charitable organizations and businesses are using it enormously. E-learning is commonly referred to the intentional use of networked information and communications technology in teaching and learning. It also refers to educational processes that utilize information and communications technology to mediate asynchronous as well as synchronous learning and teaching activities [1]. Hence, colleges around the world have begun to update their systems so as to embrace innovations that help with accomplishing their pedagogical objectives. E-learning fundamentally concentrates on online learning, PC based learning and virtual learning. There has been tremendous increase in the use of e-learning and demand among university students [2].E-learning is commonly defined as the intentional use of Information and Communications technology in teaching and learning [1].

A successful implementation of e-learning should highly consider students who will utilize such frameworks for learning. Hence, the point of this exploration is to build up a hypothetical framework in light of a surely understood innovation called Technology acceptance model (TAM). TAM is a users' aim based model. It has been developed to explain and/or to predict the users' acceptance of computer technology. [3] It has been used as the theoretical basis for many empirical studies of user technology acceptance.[4]. The proposed model adds to the high volume of exploration on e-learning in the technical college, and it will be utilized to quantify scholastics' behavioral goal for utilizing the e-learning. TAM was produced to discover the components which lead individuals to acknowledge or dismiss data innovation.

II. LITERATURE REVIEW

The Technology Acceptance Model provides the conceptual framework for this study[8]. TAM, proposed by Davis in 1986, has turned into a broadly referred to show for anticipating and clarifying user conduct and IT use. The origins of TAM is emerged from to the theory of reasoned action (TRA). The TRA requires that remarkable convictions about beliefs towards a specific conduct can be inspired each time the conduct being concentrated Al-Gahtani [9] confirms the validity and reliability of TAM constructs to predict IS adoption in Arab culture. As a simplification of TRA, the TAM suggests that users' decisions to accept a new information technology are based on two rational assessments of its expected outcomes: (i) perceived usefulness (PU), defined as user expectation that using a new information technology could result in improved job performance and (ii) perceived ease of use (PEOU), defined as the degree to which a person believes that using a particular system would be effortless[8].In the past decades, PEOU and

PU builds have been viewed as essential in deciding an individual's acknowledgment and utilization of data innovation (IT). Data framework (IS) specialists have explored and repeated these two components and concurred that they are legitimate in anticipating singular acknowledgment of different corporate data advances.

It has been found that there is a relationship between user's convictions around technology usefulness and the state of mind and the aim to utilize the technology. Compared to the other variables discussed in the literature, perceived usefulness exhibits stronger and more consistent relationship with usage. In addition, an individual may adopt a technology if he or she perceives it as convenient, useful and socially desirable even though they do not enjoy using the technology[10].Thus, there might be a possibility of a direct relationship between beliefs and intentions.

Almost all technical colleges in Oman have a deanship for e-learning, which is made to help the students to improve and address the need to use e-learning at colleges. It additionally helps with dealing with the e-learning process by keeping the students' information composed, arranging courses, making content accessible to students, following student's' execution and creating reports about it, facilitating communication with students, and offering testing and appraisal tools .

E-learning provides academics with features to facilitate their teaching experience, like course and user-management tools, forums, quizzes, and announcements. Students can upload their assignments , practice for their quizzes, refer to the tutorials for the benefit of their studies. Some of the technical colleges offer only course materials delivery through web, and the others have had integral framework for their e-learning system to be used for regular students and high flyers. Consequently, students can now utilize e-learning to get class notes or data, take assessments, and convey at whatever point and wherever the need emerges.

III.   RESEARCH MODEL AND HYPOTHESIS

Technology Acceptance Model(TAM) is the most commonly used model because of its understandability and simplicity[6].Most of the studies have examined users' e-learning acceptance or adoption either by using the original Technology Acceptance Model (TAM)[5]. In this study, the e-learning was viewed as a framework that makes utilization of Internet and web innovation in fulfilling its main goal of conveying data to and communicating with the students through a computer interface. TAM has successfully predicted and explained almost equal behavioral intention to adopt a new technology among inexperienced and experienced users[7].

The proposed research model is shown below:
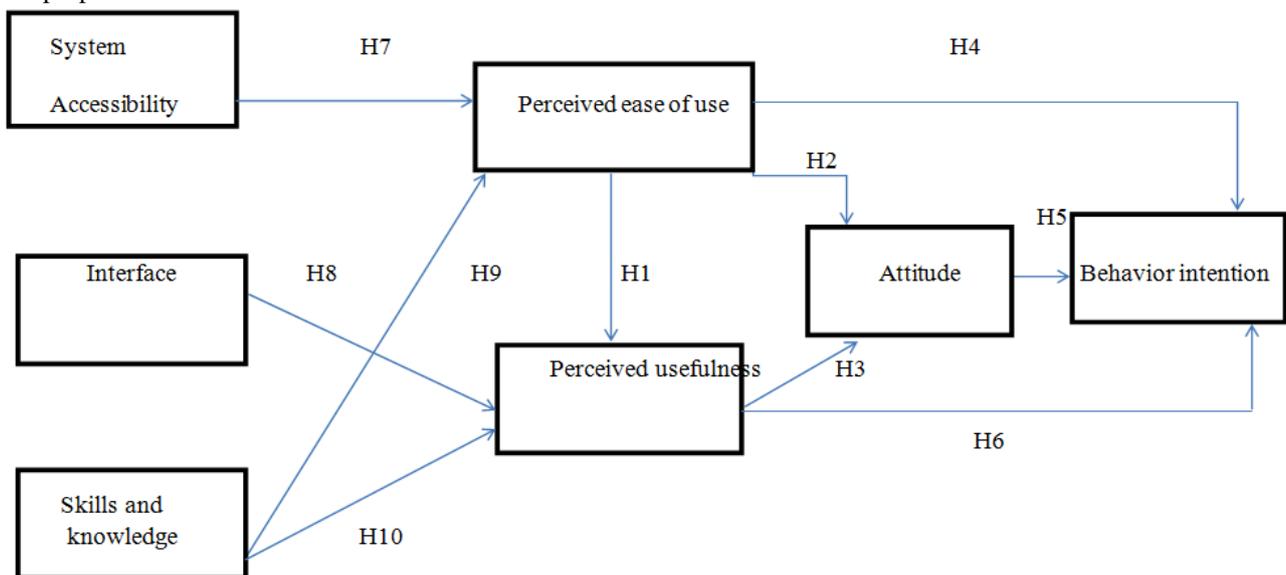
The development of relevant hypotheses are discussed as follows:

Many researchers have used perceived usefulness as one of the most important components of TAM. Perceived usefulness can be defined as the degree to which a person believes that using a particular system would enhance his or her job performance [5,8]. Perceived ease of use is defined as "the degree an individual believes that using a particular system would be free of effort"[8]. Attitude towards e-learning can be characterized as user's response and correspondence towards e-learning websites. It demonstrates user's advantage towards e-learning site furthermore your presentation of utilizing site. Behavior intention is defined as the degree to which a person has formulated conscious plan to perform or not to perform some specified future behavior[5].

System Accessibility is defined as the capacity or authority to interact with a computer system, bringing about a stream of data and yield information from a data source. Interface is defined as everything outlined into a data gadget with which an individual may cooperate - including show screen, console, mouse, light pen, the presence of a desktop, enlightened characters, help messages, and how an application program or a Web webpage welcomes collaboration and reacts to it. The concept of knowledge refers to recognition with genuine data and hypothetical ideas. Skills refer to the capacity to apply information to particular circumstances. Skills are created through practice, through a blend of input and output.

The research hypothesis based on the above proposed TAM model is given below:

H3: Perceived usefulness has a positive effect on attitude towards using e-learning.

H5: Attitude towards using e-learning has a positive effect on intention to use.

H6: Perceived usefulness has a positive effect on intention to use e-learning.

H8: Interface has a positive effect on Perceived usefulness.

H10: Skills and knowledge has a positive effect on Perceived usefulness.

H1: Perceived ease of use has a positive effect on perceived usefulness of e-learning.

H2: Perceived ease of use has a positive effect on attitude towards using e-learning.

H4: Perceived ease of use has a positive effect on intention to use e-learning.

H7: System accessibility has a negative effect on perceived ease of use.

H9: Skills and knowledge has a positive effect on perceived ease of use.

IV. RESEARCH METHODOLGY

4.1 Survey

The proposed hypothesis was tried by collecting information, utilizing online survey methods. The aim of the survey was to assess the utilization of TAM to the e-learning framework. The survey questions were provided in both English and Arabic. The survey was announced in the e-learning portal by creating a particular URL. From the respondents, a sample of 180 was randomly from various departments of the college. Since the reason for the study is to discover the variables influencing user's goal towards learning through sites, so the demographic characteristics were incorporated into the survey. To assess the responses of the respondents, we used five point Likert's scale as (1|)Strongly disagree,(2) Disagree, (3) Unsure, (4) Agree, (5) Strongly agree.

Table 1 summarizes the demographic characteristics of the users.

Table I: Sample Demographics

Variables		Percentage
Gender	Male	28%
	Female	72%
Age	< 21	8%
	21 - 25	86%
	>25	6%
Department	IT	54%
	Business studies	5%
	Engineering	26%
	Applied Science	7%
	English Language Center	8%
Level	Foundation	5%
	Diploma	12%
	Advanced Diploma	50%
	Bachelor	33%

4.2 Measuring TAM Hypothesis

According to the current study's research model, there are 22 items measured.

Table II: Questionnaire

Perceived Ease of use	
PEU1	E-learning portal is easy to access
PEU2	Received orientation for the usage of e-learning
PEU3	Navigation in e-learning portal is easy
PEU4	Communication in e-learning portal is not difficult.
Perceived usefulness	
PU1	E-learning portal explains the learning objectives.
PU2	It is easy to understand the course contents.
PU3	Reference materials in the e-learning portal help to achieve the goals.
PU4	It enhances the productivity of the course.
Attitude	
AT1	E-learning increased the interest towards the course
AT2	I like to use e-learning for my studies.
AT3	It increased the positive attitudes for my studies.
Behavioral intention	
B11	I prefer to study using e-learning.

BI2	I plan to use e-learning in the future
System Accessibility	
SA1	It is easy to access e-learning in college.
SA2	It is not difficult to access e-learning outside the college.
SA3	I don't face any problem in downloading the reference materials/videos/assignments through e-learning.
Interface	
IN1	Interface of e-learning portal is user friendly
IN2	All images, texts, videos are clearly visible and audible.
IN3	Interface of e-learning is attractive
Skills and knowledge	
SK1	Using the reference materials, videos and images increase my knowledge.
SK2	I have basic skills for using e-learning system
SK3	It increase my skills of self-study

V. DATA ANALYSIS AND RESULT

5.1 Measurement Validity and Reliability

Measurement validity and reliability was assessed to ensure the internal validity and consistency of the items used for each variables.

To analyze validity of measures performed in this study, factor analysis was done. Based on the six constructs used in this study- Perceived usefulness, Perceived ease of use, Attitude, Behavioral intention, System accessibility and Interface, six factors were requested.

Table III: Factor Loading

Constructs	Items	Factor loadings
Perceived usefulness	PU1	0.741
	PU2	0.709
	PU3	0.708
	PU4	0.681
Perceived ease of use	PEU1	0.672
	PEU2	0.664
	PEU3	0.654
	PEU4	0.653
Attitude	AT1	0.638
	AT2	0.634
	AT3	0.628
Behavioral intention	B11	0.608
	B12	0.600
System accessibility	SA1	0.586
	SA2	0.575
	SA3	0.543
Interface	IN1	0.523
	IN2	0.510
	IN3	0.503

Reliability assessment was done using Cronbach's Alpha[11]. Reliability concerns internal consistency between multiple measurements of variables, and Cronbach's Alpha is commonly used to measure it[12]. Cronbach's alpha values from 0.6 to 0.7 were deemed the lower limit of acceptability. An alpha of more than 0.7 would indicate that the items are homogeneous and measuring the same constant[13].

Table 4 shows the reliability of the measurement scales.

Table IV: Cronbach's Alpha

Scale	Cronbach's Alpha
Perceived usefulness	0.812
Perceived ease of use	0.765
Attitude	0.843
Behavioral intention	0.723
System accessibility	0.684
Interface	0.643

The below table summarizes the result obtained from the hypothesis test.

Table V: Summary of hypothesis test

Hypothesis	Specification	Result
H1	Perceived ease of use has a positive effect on perceived usefulness of e-learning.	Supported(β=0.723, t=11.394, R^2= 0.797, p<0.001)
H2	Perceived ease of use has a positive effect on attitude towards using e-learning.	Supported(β=0.749, t=12.392, R^2=0.576, p<0.001)
H3	Perceived usefulness has a positive effect on attitude towards using e-learning	Supported(β=0.342, t=2.213, R^2= 0.187, p<0.05)
H4	Perceived ease of use has a positive effect on intention to use e-learning.	Supported(β= - 0.322 , t=-2.635, R^2= 0.524, p<0.05)
H5	Attitude towards using e-learning has a positive effect on intention to use.	Not Supported(β=0.009, t=0.121 ,R^2= 0.192, p>0.05)
H6	Perceived usefulness has a positive effect on intention to use e-learning.	Supported(β=0139, t=2.621, R^2= 0.274, p<0.001)
H7	System accessibility has a negative effect on perceived ease of use	Supported(β=0.291, t=5.063, R^2= 0.018, p<0.001)
H8	Interface has a positive effect on Perceived usefulness.	Not Supported(β=0.317, t=0.941, R^2= 0.093, p>0.05)
H9	Skills and knowledge has a positive effect on perceived ease of use.	Supported(β=0.532, t=8.394, R^2= 0.557, p<0.001)
H10	Skills and knowledge has a positive effect on Perceived usefulness.	Supported(β=0.0637, t=8.875, R^2= 0.140, p<0.05)
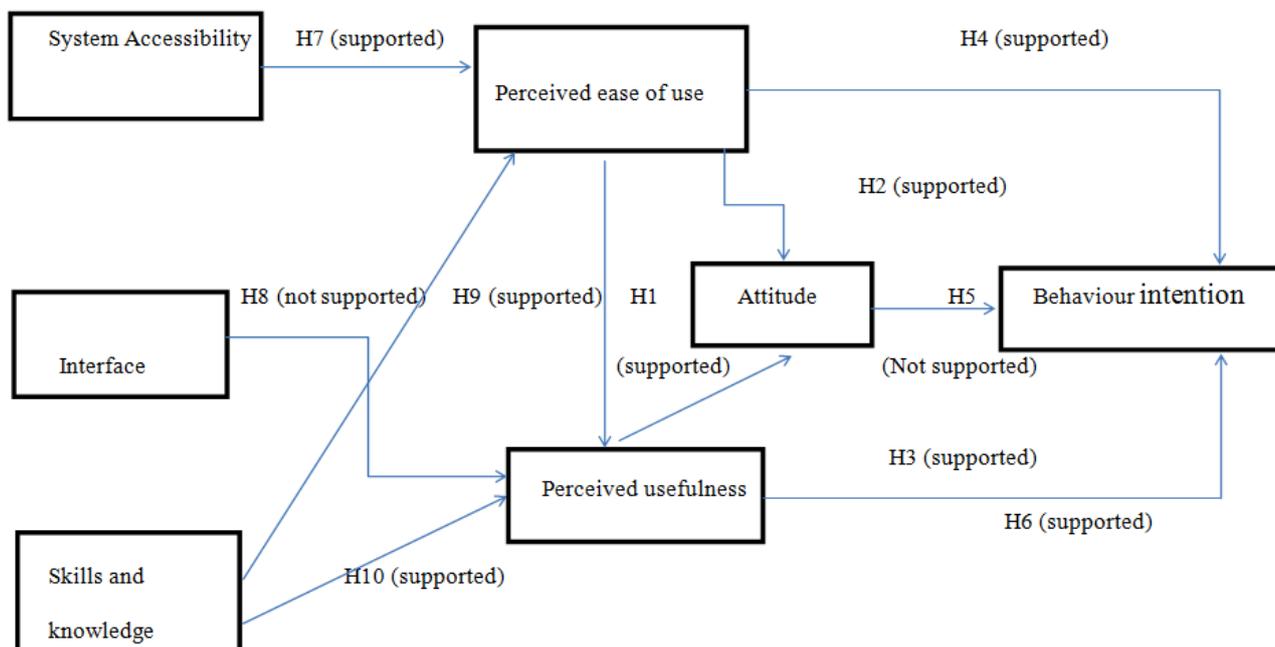
VI. DISCUSSION

In this study, a number of relationships were examined to reveal student's usage of e-learning in their studies. The statistical analysis demonstrates that the findings of the current study are consistent with the first TAM findings. The results points out the main factors that are influencing the student's intention towards the usage of e-learning system. It is found that the skills and knowledge and the system accessibility are the important factors that affect the intention to use e-learning. The findings of the above study supported that the usage of e-learning reduces time and location dependency as the students are using the chat and email tools for sharing and communicating the ideas with their teachers and peer groups. Also the student's behavioral intention towards the e-learning use increases as the tutorials and practice quizzes help them to perform well in their exams. Student's behavioral intention to use the technology may increase as they feel that they may be behind the technology if they don't have enough practice in using e-learning system. It is found that for certain courses, e-learning is beneficial but for some courses this system is inappropriate. In the case of Engineering and Applied science course there is no proper support for their laboratory activities.

The student's perception to use the e-learning system can be increased by providing proper orientation and thereby increases their self-confidence and attitude.

VII. CONCLUSION AND RECOMMENDATION

This paper presents the findings obtained from the data of the survey that was conducted to assess the intention to use the e-learning system among the students of different departments in the technical college. The original TAM was modified in this study in order to measure the behavioral intention and attitudes of the students to use the e-learning system. The findings in this paper justifies the relationship between perceived ease of use, perceived usefulness, attitude, behavioral intention, system accessibility, skills and knowledge and interface.

This study has been done in one of the technical college in Muscat which has some limitations that should be discussed in the future research. The first limitation is that all the departments of the college are not included in the study. Secondly, the sample size selected is small compared to the total population. Also there may be some other influencing factors that can affect the study. The result may vary if we consider the above factors. Moreover other statistical tests could be conducted to check the reliability and validity of the variables.

REFERENCES
[1]   Naidu, S. (2003). *E-learning: A guidebook of principles, procedures and practices. Commonwealth Educational Media Centre for Asia* (CEMCA), New Delhi.
[2]   Volery, T. & Lord, D. (2000). *Critical success factors in online education. The International Journal of Educational Management, 14(5), 216-223.*
[3]   Hu, P.J., Chau, P.Y.K., Sheng, O.R.L., & Tam, K.Y. (1999). *Examining the technology acceptance model using physical acceptance of telemedicine technology. Journal of Management Information Systems*, 16(2), 91-112.
[4]   Adams, D. A., Nelson, R.R. and Todd, P.A. (1992). *Perceived usefulness, ease of use, and usage of information technology: A replication. MIS Quarterly,* 16, 2, 227-247.
[5]   Davis, F.D., Bagozzi, R.P., & Warshaw, P.R. (1989). *User acceptance of computer technology: a comparison of two theoretical models. Management Science,* 35(8), 982-1003.
[6]   Legris, P., Ingham, J., & Collerette, P. (2003). *Why do people use information technology? A critical review of the te chnology acceptance model. Information and Management,* 40(3), 191-204.
[7]   S. Taylor and P. Todd, "*Assessing IT usage: The role of prior experience," MIS quarterly*, vol. 19, pp. 561-570, 1995.
[8]   Davis, F.D. (1989). *Perceived usefulness, perceived ease of use and user acceptance of information technology. MIS Quarterly*, 13(3), 319-339.
[9]   S. Al-Gahtani, *"The applicability of TAM outside North America: an empirical test in the United Kingdom," Information Resources Management Journal (IRMJ),* vol. 14, pp. 37-46, 2001.
[10]   Saga, V.K., & Zmud, R.W. (1994). *The Nature and Determinants of IT Acceptance, Routinization and Infusion:* In proceedings of the IFIP TC8 working conference on diffusion, transfer and implementation of information technology, North Holland.
[11]   L. J. Cronbach, *"Coefficient alpha and the internal structure of   tests," Psychometrika*, vol. 16, pp. 297-334, 1951.
[12]   J. Hair, W. Black, B. Babin, R. Anderson, and R. Tatham, "*Multivariate Data Analysis: Pearson Education,"* New Jersey: Hoboken, 2006.
[13]   Nunnally, J.C. (1978). *Psychometric Theory*, (2nd ed.). New York: McGraw-Hill.