How Facilitating Conditions Impact Students' Intention to Use Virtual Lectures? An Empirical Evidence

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***Abstract*—Virtual lectures are popular live delivery of lectures via the Internet, which have been adopted recently as alternative or adjunct to traditional lectures worldwide. Whereas the adoption and usage of virtual lectures have been studied extensively, we do not know how facilitating conditions influence students' intention to use this technology. Therefore, this research aimed to fill this knowledge gap by studying the dimensions of the facilitating conditions that could influence students' intention to use virtual lectures. A quantitative approach was followed, by obtaining 204 survey responses at a Jordanian university, and statistically testing the dimensions of the 'facilitating conditions' construct adapted from the Unified Theory of Acceptance and Use of Technology (UTAUT) models. Results revealed that students' familiarity, online support, course fee and course nature suitability can significantly influence students' intention to use virtual lectures, whereas technical resources availability and system compatibility showed insignificant impact on usage intention. Research implications and future work were specified afterwards.**

Keywords—Facilitating Conditions; Intention to use; Virtual Learning; Virtual Lectures; Synchronous Student Learning Systems

I. INTRODUCTION

In today's dynamic tertiary education systems, web-based applications are playing an increasingly significant role in supporting the learning process. For instance, utilizing blackboards, e-learning classroom systems, online exams, web-based learning systems and virtual lectures could change education significantly [1]. University virtual lectures, specifically, continue to grow increasingly and are expected to become a more general learning trend in many developing countries worldwide.

A lecture is traditionally defined as "a process in which information passes from the notes of the lecturer to the notes of the student without passing through the minds of either" [2, P.640]. In general, lectures have been remaining the popular approach of undergraduate teaching since universities were founded, for several reasons. Firstly, lectures are effective in delivering big amounts of information by one person to a flexible numbers of students (lecturer-centered approach). Secondly, lectures can be easily combined with other teaching methods [2][3]. Additionally, lectures are considered cost-effective instruction methods, especially for big classes. However, the emerging web technologies have transformed the university learning styles to become more learner-centered, which has popularized the live delivery of internet and virtual lectures as alternative or adjunct to traditional lectures [4]. Virtual lectures (also called synchronous classes or digital live lectures) are playing an increasingly significant role in delivering today's lectures at many universities and educational institutes globally.

It is worth mentioning that virtual lectures are not equivalent to e-learning or online learning. Specifically, e-learning is considered the umbrella of all mentioned terms that indicates utilizing electronic means to support the learning process, whereas online learning comprises the utilization of the internet and web-based application for education purposes, where material could be stored on storage devices for anytime use. Virtual lectures, however, means attending live lectures synchronously and by digital means without students' physical attendance to classes.

There are several advantages afforded by the usage of virtual lectures in comparison to traditional lectures:

1) Students have the opportunity to take the lecture in the place of their own choice, resulting in more spatial learning flexibility [4][5].
2) Virtual lectures are highly useful for students who live in rural areas or in a region far from the university campus. They are also suitable for students who find some kind of trouble with transportation to attend university lectures on campus in a daily basis.
3) By using virtual lectures, students can learn at their most attractive mode of learning, such as having the most appropriate setup and convenience [3][4].
4) Virtual lectures provide a better alternative to traditional lectures in large classes with 50 or more students, in which the former are more practical way for every student to take advantage of an instructor's teachings, and the instructional material presented [3].
5) Virtual lectures have environmental and social advantages, such as decreasing pollution rate and road traffic, and saving time in getting on campus of universities or colleges. These advantages benefit students as well as lecturers and people in the society.

Despite its popularity and potential, virtual lectures are currently having very limited adoption rates in Jordanian universities and colleges. In addition, little research in the literature is found to address the factors that influence students' usage of virtual lectures in this country. For instance, students' willingness to accept and take virtual lectures was empirically examined by applying the whole UTAUT model [4]; the findings

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revealed that facilitating conditions (as one variable) and attitudes towards virtual lectures were exclusively found to have significant direct influence on students' intention to take virtual lectures. Whereas 'attitudes' construct is an original variable in the UTAUT model, and well defined in huge bundle of research, the construct 'facilitating conditions' has been usually included as an optional extension, and has not been clearly measured as the 'attitude' construct. Furthermore, there might be many facilitating conditions that could influence students' intention to use virtual lectures, which varies in its significance and influence power. Whereas the paper [4] fully utilized the UTAUT in an empirical study, the current study extends the previous one by focusing on 'Facilitating conditions' as a focal construct of 6 variables to empirically test and valid them separately, as no previous studies have yet paid any attention to them. Therefore, this study aimed to investigate these dimensions of the facilitating conditions, and to understand which of them could have a significant influence on students' intention to use virtual lectures. Accordingly, this paper reviews the relevant literature in Section II, and then demonstrates research model and hypotheses in section III. In Section IV, the methodology of this research is presented, followed by the findings and analysis in Section V. Finally, a discussion and conclusion are given in the Section VI.

II. LITERATURE REVIEW

Facilitating conditions are originally defined as the objective factors in the environment that observers agree that they make an act easy to accomplish [6][7]. Those objective factors are theorized to have a direct effect on intention to use information technology resources. In the context of virtual lectures, facilitating conditions can be relating to the people directly involved in the process (students and faculty members), the technical infrastructure, and the technical support for the use of the virtual lecturing system [8][9]. Facilitating conditions could act as an adoption enabler if available resources and facilities are adequate, and accordingly individuals may exhibit positive attitudes toward the use of virtual lectures [7]. Conversely, facilitating conditions could lead to negative attitudes towards virtual lectures should those conditions are not found satisfying to users.

As mentioned earlier, facilitating conditions have been extensively used as an extension of the (UTAUT) and its next version (UTAUT2), which are widely used in the field of information and communication technology acceptance modeling [6][7]. In relevance to this study, 'facilitating conditions' has been studied in the fields of electronic learning [8]-[16], online learning [17][18], virtual learning and virtual lectures [19]-[23], and mobile learning [24]. It is noteworthy that most of the studies found in the literature focused on the acceptance and usage of e-learning tools and technologies, whereas very scant research particularly concentrated on the adoption of virtual lectures. In addition, the construct 'facilitated conditions' has been measured by different items, and thus we do not understand precisely how facilitating conditions influence e-learning technologies in general, and virtual lectures specifically. Moreover, this construct is most often studied as one variable while its items differ from one study to another, resulting in low clarity of the nature of this construct, and a little understanding about how it affects intention to use virtual lectures. Importantly, no previous studies have been found yet in the literature that discuss the factors that compose the 'facilitated conditions' variable, and how these components influence students' intention to use virtual lectures specifically, and e-learning technologies in general.

Therefore, this study proposes and tests some variables that are associated with the 'facilitating conditions' construct, and discover its influence on intention to use virtual lectures. This original endeavor has not been seen in the literature, to date. Next section discusses the factors in details.

III. RESEARCH MODEL AND HYPOTHESES

Based on the literature of the 'facilitating conditions' construct and its associated items, six variables were developed to measure their impact on students' intention to use virtual lectures. These variables are: students' familiarity, technical resources availability, system compatibility, online technical support, course fee and course nature suitability. The proposed research model is shown in Fig. 1.

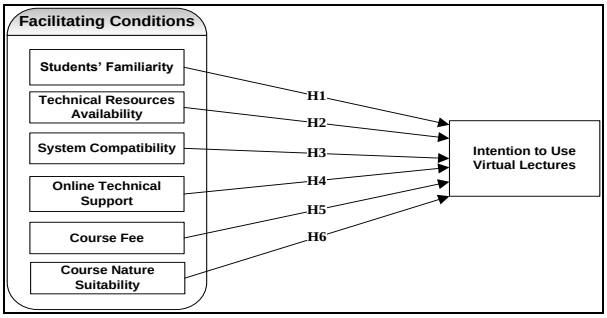

Figure 1 Proposed research model

The research hypotheses associated with the research model are seven, presented in Table I.

TABLE I SET OF RESEARCH HYPOTHESES

H#	Statement
H1	Students' familiarity significantly influences their intention to use virtual lectures
H2	The availability of technical resources significantly influences students' intention to use virtual lectures
H3	System compatibility significantly influences students' intention to use virtual lectures
H4	Online technical support significantly influences students' intention to use virtual lectures
H5	Course fee significantly influences students' intention to have it via virtual lectures
H6	Course nature suitability significantly influences students' intention to use virtual lectures

IV. METHODOLOGY

This study followed a quantitative approach to address the research aim. The targeted population was all undergraduate students at the Faculty of Economics and Administration, at Al-Zaytoonah University of Jordan (in Amman, Jordan). This faculty is considered the largest in the university in terms of students and resources, and includes six departments: business administration, accounting, finance, marketing, management information systems, and tourism management. Details about the data gathering, instrument development, and instrument validity are presented in the subsequent subsections.

A. Data Gathering

The research data were gathered through a random sampling approach via an online self-administered survey. In total, 218 respondents completed the survey in two-week duration, but 14 of those responses were discarded due to incompletion, and thus, a net sample of 204 usable questionnaires remained. This sample size is considered statistically sufficient, given the 95% confidence interval and the population size of the Jordanian undergraduate students locally (around 55,000). This sample size is also consistent with the often-cited 10 times rule, which states that the sample size should be equal or larger than 10 times the largest number of structural paths at a particular construct in the model [25][26]. The survey was mainly promoted online and hosted by the e-learning system at the faculty. Students were invited to take the questionnaire by sending them the link of the survey webpage on their e-learning system profiles. As an incentive for participation, respondents were given the chance to enter a prize draw of a bookshop voucher valued 30JDs.

B. Instrument Development

A survey instrument of 29 items was developed based upon the conceptualization and development work of previous literature [6][7][17]-[23]. Specifically, the questionnaire contained 4 items for variables such as 'familiarity', 'system compatibility' and 'course nature', whereas the constructs 'course fee', 'online technical support', 'technical resources', and 'intention to use' had 3 items each. Items are shown in Appendix A. In addition, five items were developed to measure demographic variables, such as gender, age, academic year (on 1st, 2nd, 3rd, or 4th year), major, study program (matinee, or evening), having work (part time, full time, or casual). A 7-point Likert scale was used to measure the constructs presented in the proposed model (scores were ranged from 1 = "strongly agree" to 7 = "strongly disagree", with "neutral" score = 4). This scale could effectively allow respondents to express their opinions in this research, as it offers a wider range of agreements to statements than the 5- point.

The survey was available in two languages (Arabic and English). When translating the questionnaires, the researcher ensured that the meaning of the source language statement was preserved in the translation (called semantic equivalence) [4]. The questionnaire was originally designed in English, and was then translated into Arabic. The back translation method was used after the Arabic version had been translated back into English by another bilingual person.

The survey instrument was refined during the pre-test phase to ensure the internal consistency of the measured instrument, with the involvement of 18 respondent students. Consequently, the wording of some questions was modified. Afterwards, a pilot study was conducted by 29 students to assure the reliability and validity of the instrument. As a result, two items which were assigned to measure the constructs 'technical resources' and 'Online technical support' were removed from the questionnaire due to their very low reliability scores (alpha coefficients of .34 and .27 respectively). Consequently, the questionnaire included 27 validated items in total.

C. Instrument Validity and Reliability

It is essential to check that the questionnaire will measure what it is supposed to measure, which is its validity [25]. Most of the items in the survey instruments were adapted from the items developed by [6][7] to estimate the facilitating conditions employed in UTAUTs, and from other studies in the virtual lectures literature [9][11][12][14][23]. Thus, the face validity of the survey instrument has been already established for most of the items. The internal consistency (reliability) of the instrument was also assessed. Reliability is the extent to which the items measure the same way each time they are used, under the same conditions, with the same sample [25][26]. Instrument's reliability was maximized by using clear conceptualization of the factors and ensuring accurate measurements, in addition to operationalizing each group of factors with multiple indicators [26]. Furthermore, the questionnaire was pre-tested and modified to ensure that it was easily understood. Additionally, the validity and reliability of the constructs and their associated items were statistically assessed in the data analysis phase.

D. Data analysis

Firstly, Descriptive statistics were performed to overview the research sample profile, by using IBM SPSS statistics18.0 software. Secondly, Structural Equation Modeling – Partial Least Squares (SEM-PLS) analysis were conducted, in order to check the effect power among various constructs, by using the SmartPLS2.0 software. SEM-PLS is a second-generation comprehensive statistical data analysis approach, which is more powerful than other first-generation multivariate techniques in measuring multiple relationships at the same time [27]. The findings are shown in the scenario below.

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V. FINDINGS AND ANALYSIS

Based on the demographics and other background characteristics of the participants in the research, around 58% of the samples were male students, whereas female students accounted for around 41% of the targeted population. In addition, around two thirds of the sampled students were in their middle academic years (either sophomores or juniors). Students with accounting, Management Information Systems (MIS) and marketing majors accounted for the majority of the study sample. Additionally, more than two thirds of the students had some sort of work (part time 41.7%, full time 19%, or casual 4.4%). Not all of them agreed to share their Grade Point Averages (GPAs), however, many of the respondents had Good or Very Good GPAs (45.6% and 23.5% respectively). Further demographic details are shown in Table II.

TABLE II DEMOGRAPHIC PROFILE OF PARTICIPANTS

Demographic variables	Categories	Response information (N=204)
Gender	Male	119 (58.3%)
	Female	85 (41.7%)
Academic year	Freshman (1st year)	27 (13.3%)
	Sophomore (2nd year)	71 (34.8%)
	Junior (3rd year)	67 (32.8%)
	Senior (4th year)	39 (19.1%)
	Other	15 (6.9%)
Major	Business administration	34 (16.7%)
	Accounting	56 (27.5%)
	Finance	18 (8.8%)
	MIS	49 (24.0%)
	Marketing	29 (14.2%)
	Tourism management	18 (8.8%)
Work	No work	71 (34.8%)
	Yes, full time	39 (19.1%)
	Yes, part time	85 (41.7%)
	Yes, casual work	9 (4.4%)
Grade Point Average	Excellent	17 (8.3%)
	Very Good	48 (23.5%)
	Good	69 (43.6%)
	Satisfactory	16 (18.5%)
	Poor	4 (6.8%)

The PLS method is usually analyzed and interpreted in two stages: firstly, by assessing the reliability and validity of the measurement model (constructs and items), and secondly, by assessing the structural model through interpreting the path coefficients and identifying the adequacy of the research model [27]. The subsequent section discusses the results of these two stages.

E. Measurement (Outer) Model Results

In order to view the correlations between the latent variable and the reflective indicators in their outer model, the values of the outer loadings were examined. Indicators with an outer loading above 0.7 were retained, whereas indicators with outer loadings between 0.4 and 0.7 were considered for removal from the scale only when deleting the indicator leads to an increase in the composite reliability (or the average variance extracted) above the suggest threshold value [27]. Indicators with very low outer loadings (below 0.4) were eliminated from the scale.

As a result, the majority of the items were above the acceptable level of (0.4), and thus demonstrating reliable items. However, two items, CN4 and SC2, were found with low loadings: (0.3815) and (0.3156) respectively. Therefore, as recommended by [27][28], these items were eliminated from this study and were not involved in further analysis. All item loadings are shown in Appendix B. In order to examine the discriminant validity across the items, the pattern of item loadings across constructs in the model was also examined. The rule of thumb for demonstrating discriminant validity is to keep the difference between an item loading on its intended construct and its next highest loading at least .10 [27]. In this research, the discriminant validity of all items was demonstrated, as all cross loadings among different constructs were not less than the determined cut off point, as shown in the same appendix (Appendix B).

Construct validity assesses whether the measures chosen are true measures of the constructs describing the event, and that these measures are actual tools for representing or measuring the construct being investigated [27][29]. For the current study, construct validity was established, including both convergent and discriminant validity. Convergent validity refers to the extent to which a measure correlates, or converges, with other measures of the same construct [27]. Convergent validity is demonstrated when the Average Variance Explained (AVE) value between the constructs is equal to, or exceeds, 0.5 [27][28]. As presented in Table III, the AVE scores for all constructs in the model were greater than .50, which meets the first requirement of achieving convergent validity. Consequently, all constructs demonstrated convergent validity. Another approach to assess the convergent validity of the constructs is to examine the composite reliability of the constructs [26][27]. All constructs exhibited acceptable to high scores of composite reliability, exceeding the .70 threshold recommended by [25]-[29]. All validity scores are demonstrated in Table III.

TABLE III VALIDITY AND RELIABILITY ESTIMATES OF THE CONSTRUCTS

Construct	AVE	Composite Reliability	Cronbach's alpha
Course Fee	0.684	0.871	0.782
Course Nature Suitability	0.699	0.864	0.796
Familiarity	0.720	0.870	0.818
Online technical Support	0.672	0.896	0.824
Intention to Use	0.761	0.910	0.853
System Compatibility	0.655	0.899	0.835
Technical Resources	0.697	0.901	0.845

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In order to assess the internal consistency, Cronbach's alpha measures need to be examined. Internal consistency is achieved when reliability estimates are greater than .70 [25]-[27]. The .07 threshold is regarded in the social sciences and Information Systems reported data to be the most commonly accepted cut off point [25][28]. As presented in Table III, all reliability scores exhibited acceptable to high reliabilities, with Cronbach's coefficient alpha exceeding the .70 threshold recommended by [25]-[28], thereby, satisfying the second requirement of convergent validity. Having provided evidence of the convergent validity of the constructs, the discriminant validity was also assessed.

Discriminant validity examines the extent to which an independent variable is truly distinct from other independent variables in predicting the dependent variable [27]. One popular approach to assess the discriminant validity followed in the current research is through examining the cross-loadings comparisons between constructs. Specifically, the AVE of each latent construct should be higher than the construct's highest squared correlation with any other latent construct [27]. The square roots of the AVE values of all constructs are calculated, and compared with correlations between constructs, as shown in Appendix C. The results indicated that all constructs in the research model achieved this criterion as none of the off-diagonal elements exceeded the respective diagonal element. Thus, discriminant validity was demonstrated.

B. Structural (inner) model results.

An assessment of the structural model was undertaken to determine the significance of the paths and the predictive power of the model through the PLS algorithm, then by considering a bootstrapping process that involved 5,000 random re-samples from the original data set to determine the significant levels of path coefficients [27]. Firstly, a systematic assessment of the structural model was conducted to assess the significance of path coefficients by examining the standard error, T-statistics, R squared value and confidence interval [28]. The amount of variance explained by R^2 provides an indication of the model fit [27] as well as the predictive ability of the endogenous variables [28]. It is suggested that the minimum level for an individual R^2 should be greater than a minimum acceptable level of .10 [27].

Table IV highlights the hypotheses of the study, and shows the path coefficient between the exogenous and endogenous variables, the Average Variance Accounted for, R^2 and bootstrap critical ratios. The bootstrap critical ratios (T-Statistics) determined the stability of the estimates and were acceptable above the value of 1.96 on 0.05 significant level [27]. The R^2 value of 'intention to use' construct was found equal to 0.427, which was greater than the recommended level of .15; indicating that this endogenous variable is explained by 42.7% of the given exogenous variables. Therefore, it was appropriate to examine the significance of the paths associated with these variables. All of the paths and all variables had bootstrap critical ratios as shown in Table IV.

TABLE IV INFLUENCE PATHS AND HYPOTHESES RESULTS

(Endogenous variables) → Intention to Use	**H#**	**Path Coefficient (β)**	**T-Statistics (|O/STERR|)**
Students' Familiarity	H1	0.1657	2.2239*
Technical Resources	H2	0.0387	0.3922
System Compatibility	H3	0.0626	0.594
Online Technical Support	H4	0.3466	3.2511**
Course Fee	H5	-0.1293	1.9894*
Course Nature Suitability	H6	0.3034	3.4567**
* Sig at .05 / **Sig at .01			

In sum, four hypotheses that were associated with familiarity, system compatibility, online technical support, course fee and course nature were supported (H1, H4, H5 and H6), whereas only two hypotheses expressing the influence of technical resource and system compatibility were not supported (H2 and H3). The results of each path are interpreted in the next section.

VI. DISCUSSION AND CONCLUSION

As shown in Fig. 2, the strongest path in the model was associated with the influence of the online technical support on students' intention to use virtual lectures, followed by the influence of each course nature, students' familiarity and course fee. However, two paths were found insignificant; the influence of the technical resource availability and system compatibility on intention to use. Significant paths are presented in normal arrows, whereas insignificant paths are presented in dotted arrows.

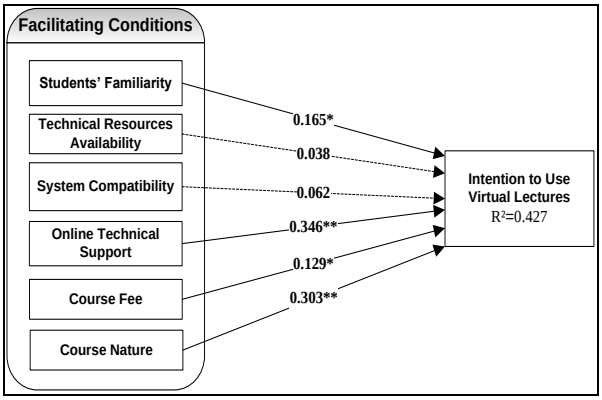

Figure 2 Validated research model

It seems that students were mainly concerned with getting online support to address any potential risk related to virtual lectures, because such a risk, if not

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handled, may result in losing important information delivered by the lecturer. In addition, the course nature can impact students' intention to use virtual lectures, especially that some practical courses and lab-based lectures require students' attendance in person to get the know-how information directly without intermediaries, to try performing tasks by themselves, or to get involved in some sort of physical class interactions.

Course fee, in turn, can affect students' intention to use a virtual lecture in a reverse way, in that the greater the virtual course fee, the less the intention to use it. Having a low-price option for getting a university course can foster students' opportunities in favor of this option, given that the majority of the students in Jordanian universities are self-funded, and that very few students who receive governmental fund to cover their tuition fees.

Students' familiarity in virtual lectures can also influence their intention to use them. This relationships indicates that the more knowledge in the technology and how to it works the more the intention to use it. However, and due the immaturity of virtual lectures at Jordan universities, students' familiarity about virtual lectures could be described as limited.

This study has several theoretical and practitioner implications. As for theory, the research has explored new constructs and provided new significant factors that influence students' intention to use virtual lectures. As discussed earlier in the literature review, no previous studies have investigated those factors in the virtual lectures arena, which in turn fills an important knowledge gap and significantly contribute to the relevant literature. Practically, it is implied that universities administration should consider the course nature, course cost and the existence of the online support when providing virtual lectures. Specifically, theoretical courses offered in reasonably low prices and supported with online helpdesk, along with educating students about using virtual lecturing systems should contribute to the success of students' usage of virtual lectures. In addition, administrations, in turn, could spread the literacy of using virtual lectures, and may provide training courses and special classes for demonstrations, in order to support students' intention to use virtual lectures. Overall, universities' administration should pay more attention on familiarizing students about virtual lectures; their nature, technicalities, limitations and challenges. In addition, administration should allocate resources for setting up and maintaining the technologies required to operate such a system, and to enable the IT infrastructure to support it. Moreover, a technical support team should be available to provide usage help and directions, especially at the beginning of each virtual course and for newly registered students. Furthermore, virtual courses should be offered in lower prices than traditional courses. By following these recommendations, administration could expect high usage rate of virtual lectures.

Future research directions might include testing the research model, or investigating the newly developed dimensions of 'facilitating conditions' in different yet relevant contexts, such as e-learning and online lectures. It is also suggested to examine the culture factor and to discover its impact on students' intention to use virtual lectures, in Jordan specifically and in the Middle East region in general.

REFERENCES

[1] D. R. Mills, "Integrating educational technology into teaching", 4th ed. Upper Saddle River, New Jersey: Pearson Education, Inc., 2006.

[2] R. Gilstrap, and W. Martin, "Current strategies for teachers". Pacific Palisades, California: Goodyear Publishing Company, Inc., 1975.

[3] J. E. Stephenson, C. Brown, and D. K. Griffin, "Electronic delivery of lectures in the university environment: An empirical comparison of three delivery styles", Computers & Education, vol. 50, no. 3, 2008, pp.640-651.

[4] A. H. Shuhaiber, "Students' Willingness to Accept Virtual Lecturing Systems: An Empirical Study by Extending the UTAUT Model", International Journal of Social, Behavioral, Educational, Economic, Business and Industrial Engineering, vol. 9, no. 4, 2015, pp. 1153-1157.

[5] C. Evans, N. J. Gibbons, K. Shah, and D. K. Griffin, "Virtual learning in the biological sciences: Pitfalls of simply putting notes on the web", Computers & Education, vol. 43, no. 1, 2004, pp. 49–61.

[6] V. Venkatesh, M. G. Morris, F. D. Davis, and G. B. Davis, "User Acceptance of Information Technology: Toward a Unified View", MIS Quarterly, vol. 27, 2003, pp.425-478.

[7] V. Venkatesh, J. Y. L. Thong, and X. Xu, "Consumer acceptance and use of information technology: extending the unified theory of acceptance and use of technology", MIS Quarterly, vol. 36, no. 1, 2012, pp. 157-178.

[8] D. Jong, & T. S. Wang, "Student acceptance of web-based learning system", In Proceedings of the 2009 International Symposium on Web Information Systems and Applications (WISA'09), Nanchang, P. R. China, 2009, pp. 533-536.

[9] F. Akbar, "What affects students' acceptance and use of technology?", 2013, Dietrich College Honors Theses.: http://repository.cmd.edu/hsshonors/179, [Retrieved: Jan, 2016].

[10] J. T. Marchewka, & K. Kostiwa, "An Application of the UTAUT Model for Understanding Student Perceptions Using Course Management Software", Communications of the IIMA, vol. 7, no. 2, 2014, pp. 93-104.

[11] U. Paola Torres Maldonado, G. Khan, J. Moon, and J. Pho, "E-learning motivation and educational portal acceptance in developing countries", Online Information Review, vol. 35, no.1, 2011, pp. 66-85.

[12] J. -L. Chen, "The effects of education compatibility and technological expectancy on e-learning acceptance". Computers & Education, vol. 57, no. 2, 2011, pp. 1501-1511.

 ISBN: 978-1-61208-473-2

[13] Á. F. Agudo-Peregrina, Á. Hernández-García, and F. J. Pascual-Miguel, "Behavioral intention, use behavior and the acceptance of electronic learning systems: Differences between higher education and lifelong learning", Computers in Human Behavior, vol. 34, 2014, pp. 301-314.
[14] C. Keller, S. Hrastinski, and S. A. Carlsson, "Students Acceptance of E-Learning Environments: A Comparative Study in Sweden and Lithuania", European Conference of Information Systems, 2007, pp. 395-406.
[15] C. Nanayakkara, "A model of user acceptance of learning management systems: a study within tertiary institutions in New Zealand", The International Journal of Learning, vol. 13, no. 12, 2007, pp. 223-232.
[16] T. Buchanan, P. Sainter, and G. Saunders, "Factors affecting faculty use of learning technologies: implications for models of technology adoption", Journal of Computing in Higher Education, vol. 25, no. 1, 2013, pp. 1-11.
[17] C.-P. Lin, and A. Bhattacherjee, "Learning Online Social Support: An Investigation of Network Information Technology Based on UTAUT", Cyberpsy., Behavior, and Social Networking, vol. 11, no. 3, 2008, pp. 268-272.
[18] D. Jong, & T.-S. Wang, "Student acceptance of web-based learning system", In Proceedings of the 2009 International Symposium on Web Information Systems and Applications, 2009, pp. 533-536.
[19] B., Sumak, G. Polančič, and M. Heričko, "An empirical study of virtual learning environment adoption using UTAUT", 2010. ELML'10, Second International Conference in Mobile, Hybrid, and On-Line Learning, 2010, pp. 17-22.
[20] E. M. Van Raaij, & J.J.L. Schepers, "The acceptance and use of a virtual learning environment in China", Computers & Education, vol. 50, no. 3, 2008, pp. 838-852.
[21] C. Keller, "Technology acceptance in academic organizations: Implementation of virtual learning environments", in proceedings of the European conference on Information Systems, 2006, pp. 1-8.
[22] C. Keller, "User acceptance of virtual learning environments: A case study from three Northern European Universities", Communications of the Association for Information Systems, vol. 25, no.1, 2009, pp. 465-486.
[23] S. Lakhal, H. Khechine, and D. Pascot, "Student behavioural intentions to use desktop video conferencing in a distance course: integration of autonomy to the UTAUT model", Journal of Computing in Higher Education, vol. 25, no. 2, 2013, pp. 93-121.
[24] K. Jairak, P. Praneetpolgrang, and K. Mekhabunchakij, "An acceptance of mobile learning for higher education students in Thailand", in Sixth International Conference on eLearning for Knowledge-Based Society, Thailand, 2009, pp. 361-368.
[25] D. W. Straub, "Validating instruments in MIS research", MIS Quarterly, vol. 13, no. 2, 1989, pp. 147-169.
[26] J. F. Hair, W. Black, B. Babin, and R. Anderson, "Multivariate data analysis", Pearson Prentice Hall Upper Saddle River, NJ, 2006.
[27] J. F. Hair, G. T. M. Hult, C. M. Ringle, M. Sarctedt, "A primer on partial least squares structural equation modeling (PLS-SEM)", Sage Publications, 2013.
[28] W. W. Chin, B. L. Marcolin, and P. R. Newsted, "A partial least squares latent variable modeling approach for measuring interaction effects: Results from a Monte Carlo simulation study and an electronic-mail emotion/adoption study", Information systems research, vol. 14, no. 2, 2003, pp. 189-217.
[29] D. Gefen, & D. Straub, "A practical guide to factorial validity using PLS-Graph: Tutorial and annotated example", Communications of the Association for Information systems, vol. 16, no. 1, 2005, pp. 91-109.

Appendix A – Measurement Items

Code	Item
FAM1	I have the knowledge necessary to use virtual lectures.
FAM2	I am familiar with virtual lectures.
FAM3	I think I am able to use virtual lectures.
FAM4	Using virtual lectures fits my learning style.
TS1	I have the technical resources necessary to use virtual lectures.
TS2	I think I have the software and hardware required to use virtual lectures.
TS3	I think that using virtual lectures may requires some special technical resources. *(reverse coded)*
SC1	Virtual lecturing system is compatible with other systems I use.
SC2	The virtual lecturing system is compatible with other e-learning systems I use.
SC3	The virtual lecturing system is compatible with other application programs that I use.
SC4	The virtual lecturing system is compatible with hardware and software I have.
OS1	I think I can get help from others when I have difficulties virtual lectures.
OS2	I think a specific person (or group) is available for assistance with system difficulties.
OS3	It is important to me to have an online help while using virtual lectures.
CF1	I have the financial resources necessary to use virtual lectures.
CF2	The cost of virtual lecture courses should be considerable.
CF3	It is important to me that the administration consider lower fees for virtual lectures courses.
CN1	I have applied university courses
CN2	I have theoretical university courses
CN3	I have some courses which are mix of theory and application
CN4	I have lab courses
INT1	I intend to use virtual lectures in the future.
INT2	I will always try to use virtual lectures in my university life.
INT3	I plan to use virtual lectures frequently.

Appendix B – Items loadings and Cross loadings

	C_fee	C_nature	Familiarity	Support	Intention	Compatibility	Resources
CF1	**.77**	.28	.27	.23	.64	.24	.24

CF2	**.77**	.27	.30	.34	.46	.31	.21
CF3	**.60**	.37	.29	.36	.56	.32	.35
CN1	.04	**.60**	.15	.43	.25	.43	.55
CN2	.05	**.79**	.29	.56	.43	.38	.39
CN3	.08	**.70**	.26	.53	.44	.30	.37
CN4	-.10	**.38**	.32	.51	.32	.36	.40
FAM1	.17	.47	**.86**	.55	.34	.58	.51
FAM2	-.10	.40	**.81**	.46	.39	.26	.53
FAM3	-.13	.31	**.84**	.40	.34	.23	.49
FAM4	.17	.44	**.75**	.37	.30	.41	.45
OS1	.22	.39	.28	**.63**	.34	.47	.36
OS2	.28	.38	.39	**.56**	.35	.54	.37
OS3	.24	.38	.21	**.79**	.25	.48	.37
INT 1	-.44	.23	.53	.16	**.88**	.33	.04
INT 2	-.40	.25	.50	.14	**.90**	.22	.11
INT 3	-.57	.26	.32	.12	**.81**	.30	.03
SC1	.25	.41	.22	.32	.19	**.73**	.37
SC2	-.33	.46	.30	.24	.19	**.31**	.29
SC3	-.32	.43	.21	.26	.16	**.81**	.21
SC4	.24	.56	.32	.50	.34	**.85**	.43
TS1	.35	.39	.63	.35	.32	.31	**.79**
TS2	.40	.28	.58	.35	.39	.22	**.78**
TS3	.29	.32	.52	.41	.24	.25	**.70**

Appendix B – Discriminant Validity

	AVE	C_fee	C_nature	Familiarity	Support	Intention	compatibility	Resources
fee	.68	**.82**						
nature	.69	.30	**.83**					
Familiarity	.72	.56	.36	**.84**				
Support	.67	.17	.50	.36	**.82**			
Intention	.76	.40	.38	.67	.42	**-.87**		
compatibility	.65	.34	.60	.34	.45	.30	**.80**	
Resources	.69	.08	.44	.32	.61	.45	.43	1