

# The Effects of Individual Cultural Values on the Students' Use of E-Learning in Higher Educational Institutions

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**Abstract** - To better explain E-learning usage in higher educational institutions, the aim of this research was to construct the cultural model of E-learning usage. The model extended the Unified Theory of Acceptance and Use of Technology by espousing cultural values as an important set of individual difference moderators. These espoused individual cultural values are masculinity, uncertainty avoidance and collectivism. A survey was conducted in a Thai university to: (a) investigate the underlying factors in the use of E-learning; and (b) explore the moderate effects of individual cultural values on E-learning usage. The results of the study revealed that all the proposed four factors (performance expectancy, effort expectancy, social influence, and facilitating conditions) are significant determinants of students' use of E-learning. The empirical results also demonstrated that the relationship between performance expectancy and E-learning usage was particularly sensitive to individual's masculinity cultural value. However, contrary to expectations, the moderate effects of uncertainty avoidance and collectivism on E-learning usage were not supported by the results of this study. The implications of these results are explored in the paper.

**Keywords** - E-Learning, User's Acceptance of E-Learning, Student's Use of E-Learning, Individual Cultural Values

## I. INTRODUCTION

E-learning is a learning system that uses web and internet technology to facilitate teaching and learning (Rosenberg, 2001). Many higher educational institutions (HEIs) around the world have made substantial investments in this technology, and E-learning is now thought to be the fundamental tool to gain a competitive edge. Despite the high amount of investment in this technology, the problem of under-utilisation amongst students in HEIs around the world has been mentioned in much literature (Chen, 2011). Much research has been conducted for explaining the use of E-learning in the context of HEIs. Based on the review of literature, prior research has mainly focused on understanding the effects of psychological and sociological factors for the use of E-learning, and has examined age, gender, experience, and voluntariness as the main moderators.

Culture is often partially blamed when HEIs experience failure of E-learning project. In spite of the fact that culture may affect students' learning behavior and use of E-learning technology, researches related to culture are limited (Van Raaij and Schepers, 2008; Lai and Lei, 2012; Tarhini et al., 2017). This study extends this body of research by incorporating an additional set of espoused individual cultural values into E-learning usage models for explaining the individual differences in the use of E-learning, and the main aim was to construct and validate the cultural model of E-learning usage.

## II. LITERATURE REVIEWS

A systematic review was conducted of the existing literature to find out the underlying factors in the use of E-learning amongst students in HEIs. By far the most papers on this topic have grounded their research on the Technology Acceptance Model (TAM). The TAM model posits that there are two particular beliefs that impact on a user's attitude towards system adoption: perceived usefulness (PU) and perceived ease of use (PEU): see Fig. 1.

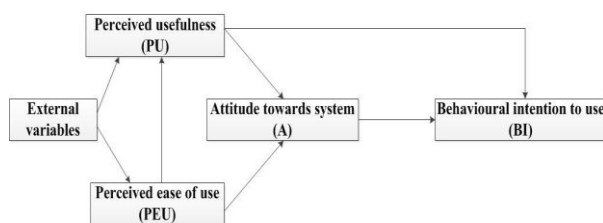


Fig. 1 Technology Acceptance Model (Davis, 1985)

By using TAM, researchers have confirmed that E-learning usage is a function of PU and PEU (Pituch and Lee, 2006). However, the consensus among researchers is that the use of only two TAM factors may not be sufficient to explain the issue of E-learning usage (McGill and Klobas, 2009). TAM highlights the importance of a user's attitude (personal factors) towards the system, but its lack of emphasis on social and resource factors is criticized as a weakness. All of these factors are modelled in the Unified Theory of Acceptance and Use of Technology (UTAUT). Because of this, the UTAUT was applied in this research as the grounded theory.

### A. Unified Theory of Acceptance and Use of Technology (UTAUT)

The UTAUT model asserts that there are four factors which affect an individual's use of new information technology: performance expectancy (PE), effort expectancy (EE), social influence (SI) and facilitating conditions (FC) (Venkatesh et al., 2003). PE is similar to TAM's 'perceived usefulness' and is defined as the degree to which an individual believes that the use of a new system would enhance their job performance. EE is similar to the 'perceived ease of use' in TAM and is defined as the degree to which an individual believes

that the use of that system does not require an increase in effort. SI is defined as the degree to which an individual believes that their important persons will approve and encourage the use of new information technology. The degree to which individual users believe that an existing infrastructure can support the use of a new technology is the definition of 'facilitating conditions'. Interestingly, the model also indicates that the influence of these factors on actual use can be moderated by individuals' background, such as gender, age, experience and how voluntary is their use: see Fig. 2.

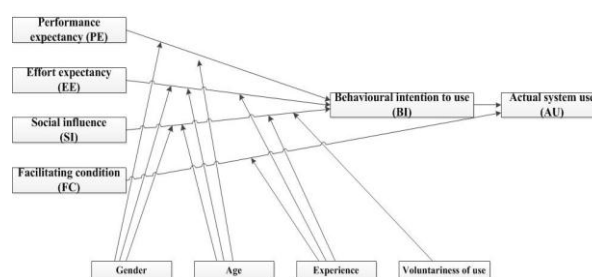


Fig. 2 Unified Theory of Acceptance and Use of Technology (Venkatesh et al., 2003)

By applying the UTAUT model, this study hypothesised that:

**H1:** performance expectancy factor will influence the use of E-learning.

**H2:** effort expectancy factor will influence the use of E-learning.

**H3:** social influence factor will influence the use of E-learning.

**H4:** facilitating conditions factor will influence the use of E-learning.

This research was undertaken in a higher education context; students may have the same range of age and experience with IT (Tan, 2013), thus age and experience variables were not included in the proposed model. Furthermore, within the same university or study course, the degree to which use was voluntary may not be different. Therefore, no variable measuring voluntariness of use was included. Even though the moderating effect of gender upon the influence of the UTAUT

factors on a student's use of E-learning remains uninvestigated to date in the area of E-learning in HEIs and this could have been a new contribution, the gender variable was not integrated into the model in this research. A model is a simplified view of a complex domain, and so to begin with, this research focused on the major variables. The moderating effect of gender will be investigated in the future work.

### ***B. The Moderating Effects of Individual-Cultural Values on E-Learning Usage.***

The four factors from UTAUT (PE, EE, SI, FC) have been widely validated in both eastern and western countries, and have been accepted by many researchers on the influence towards the acceptance and use of E-learning (Šumak et al., 2011). However, researchers suggests the UTAUT model may perform differently for explaining E-learning usage in different culture such that some factors could become more or less important in one culture than they are in other cultures (Tarhini et al., 2016).

Culture is a pattern of thinking, feeling, and acting (Kroeber and Kluckhohn, 1952). Culture is a factor that affects students' use of E-learning system, but researchers have generally been interested in nation-level culture (Yoo and Lenartowicz, 2011). The term culture is not necessarily synonymous with the term country: national boundaries do not necessarily characterize students' cultural values (Yoo and Donthu, 2002). This research therefore focuses on individual cultural values rather than national cultural values. Hofstede's framework of culture was applied in this research as cultural typology at the individual level. The four dimensions that can be used to distinguish among different cultures: these are masculinity, uncertainty avoidance; collectivism; and power distance (Hofstede, 1986).

Masculinity is the degree to which assertiveness, material possessions, and lack of interest in others (Hofstede and Hofstede, 1991). People with a high masculinity cultural value are more task-oriented and will emphasize work goals such as earning and

promotions than those holding lower masculine value (Robichaux and Cooper, 1998). Regardless of the system ease of use, people with high masculine values are more concerned with the usefulness of a given technology (Srite, 2006). Therefore, it is hypothesised that:

**H5:** The higher the degree of masculinity, the higher effect of performance expectancy on student's use of E-learning.

Uncertainty avoidance is defined as the extent to which individuals in a culture feel discomfort from uncertainty and ambiguity, and how hard these individuals try to eliminate the discomfort (Hofstede, 1986). Individuals with low uncertainty avoidance cultural values, to give an example, tend to have a greater willingness to take risks and will feel less anxiety with unfamiliar situations than those holding higher value. Research conducted a comparing of samples of users from high and low uncertainty avoidance found a moderating effect of cultural value on the usage of information technology and suggest effort expectancy factor more likely to encourage usage among users from high uncertainty avoidance (McCoy et al., 2007; Sánchez-Franco et al., 2009). People with high uncertainty avoidance tend to feel threatened by unknown situations than those holding lower value, and the more ease of technology use is desired to reduce off-task anxiety (Kanfer et al., 1994; Srite, 1999). Therefore, this study hypothesised that:

**H6:** The higher the degree of uncertainty avoidance, the higher effect of effort expectancy on student's use of E-learning.

Collectivism is the cultural dimension that describes the closeness of the relationship an individual has with other people (Hofstede, 1986). Individuals with a low-collectivism would focus on themselves and their families, while a high-collectivism individuals would focus on a bigger social group that encompasses more than their immediate family and includes extended families, friends and those with similar interest. Srite's research

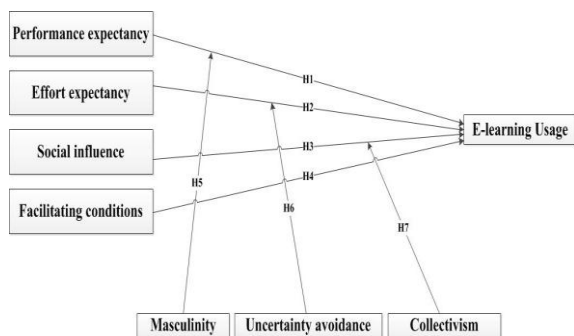
conducted in 2006 found that social influence was a significant predictor of IT acceptance in a high-collectivism culture but there was no significant effect of this factor low-collectivism culture (Srite, 2006). Since intrinsically they tend to place more emphasis on the opinions of social referents, users in high-collectivism culture perceive a higher social pressure to use a technology (Watson et al., 1994). Therefore, this study posited that:

**H7:** The higher the degree of collectivism, the higher effect of social influence on student’s use of E-learning.

Power distance dimension focuses on the extent that individuals in a culture accept the inequality between themselves and other parties who wield more power within their society (Hofstede, 1986). There was limited evidence to support the moderating role of power distance on the use of E-learning and other information technology. This study therefore did not hypothesised the moderate effect of this cultural value.

**C. The Cultural Model of E-Learning Usage**

The cultural model of E-learning usage was constructed to explain the use of E-learning in the context of Higher Educational Institutions, see Fig. 3.



**Fig. 3** Cultural Model of E-Learning Usage

The model proposed four underlying factors that influence a student’s use of E-learning: these are performance expectancy, effort expectancy, social influence and facilitating conditions. The model extends this line of research by proposing the three moderate effects of culture on the student’s use of E-learning. These are: (a) the moderate effect

of masculinity on the relationship between performance expectancy and E-learning usage, (b) the moderate effect of uncertainty avoidance on the relationship between effort expectancy and E-learning usage, and (c) the moderate effect of collectivism on the relationship between social influence and E-learning usage.

**III. RESEARCH METHODOLOGY**

To verify the validity of the proposed cultural model of E-learning usage, Thailand was selected as a survey area. To control the potential effect of university variables (e.g. type of E-learning system and infrastructural constraints) on individual student use of E-learning, the participants in this experiment were students at a single Thai university, Rajamangala University of Technology Thanyaburi (Mathieson, 1991). Furthermore, to control the effect that average usage on E-learning in the different subjects might be different, the study examined only students in the subject of Web Design Workshop. Of the 120 distributed questionnaires, 3 were not completed validly, and 10 were not returned, resulting in 107 valid responses (a response rate of 89.1%). Seven factors (PE, EE, SI, FC, masculinity, uncertainty avoidance, and collectivism) in the cultural model of E-learning usage are subjectively measured using the eleven-point Likert Scale, with 10 being “Strongly Agree” and 0 being “Strongly Disagree.” These factors were measured primarily by adapting previously validated items (see Table I). E-learning usage factor was measured by asking the participants to estimate their intention to use E-learning, the frequency of monthly usage and average time spent on each usage.

**TABLE I**  
**THE SOURCE OF ITEMS, QUESTION ITEMS,**  
**AND CRONBACH'S ALPHA VALUE**  
**OF EACH ITEM SET**

	Items	$\alpha$
<b>PE</b>	<ul style="list-style-type: none"> <li>▪ I would find E-learning useful in my education</li> <li>▪ Using E-learning allows me to learn more quickly</li> <li>▪ Using E-learning improves my grade</li> </ul>	.88
<b>EE</b>	<ul style="list-style-type: none"> <li>▪ Learning to operate E-learning system is easy for me</li> <li>▪ It would be easy for me to become skilful at using E-learning</li> <li>▪ I would find E-learning easy to use</li> </ul>	.77
<b>SI</b>	<ul style="list-style-type: none"> <li>▪ The director of my university has been helpful in the use of E-learning?</li> <li>▪ Lecturers have supported the use of E-learning?</li> <li>▪ Friends have supported the use of E-learning?</li> </ul>	.88
<b>FC</b>	<ul style="list-style-type: none"> <li>▪ I have necessary IT resources (e.g. a computer and internet) to use E-learning?</li> <li>▪ The university provides me with the necessary IT resources to use E-learning?</li> <li>▪ IT staffs are available for assistance when I find the difficulty in the use of E-learning?</li> </ul>	.81
<b>Masculinity</b>	<ul style="list-style-type: none"> <li>▪ The fulfilment of tasks is more important than caring for others.</li> <li>▪ I admire winners and think those who lose must be punished</li> <li>▪ At work, I need to have clear objectives and an evaluation system for what I accomplish</li> </ul>	.91
<b>Uncertainty avoidance</b>	<ul style="list-style-type: none"> <li>▪ When starting a new job, I fear doing it</li> <li>▪ I fear uncertainty about the future</li> <li>▪ I fear ambiguous situations and unfamiliar adventures.</li> </ul>	.86
<b>Collectivism</b>	<ul style="list-style-type: none"> <li>▪ Being accepted as a member of a group is more important than having autonomy and independence</li> <li>▪ Group success is more important than individual success</li> <li>▪ Being loyal to a group is more important than individual gain</li> </ul>	.85
<b>Measurement Sources</b> Davis et al. (1989); Hofstede & Hofstede (1991); Venkatesh et al. (2003); Srite & Karahanna (2006); Shin et al. (2007); Yoon (2009).		

The pilot study was carried out with 30 students. Cronbach's technique was used to determine the internal consistency of the set of items (Cronbach, 1951). The results indicated that Cronbach's values for the sets of items in this study were above 0.7, exceeding the threshold value recommended by Nunnally (1987). Therefore, the questionnaire for measuring each E-learning usage factor was considered a reliable measurement instrument.

#### IV. DATA ANALYSIS AND RESULTS

To investigate the factors affecting the use of E-learning (H1, H2, H3, and H4), canonical correlation analysis was conducted using the four proposed expectation factors (performance expectancy; effort expectancy; social influence; facilitating conditions) as a predictor of the three measurements of actual E-learning usage (intention to use; frequency of monthly usage; and average time spent on each usage). The relationship between the set of the four expectation factors and the three measurements of actual E-learning usage was statistically significant, Wilks'  $\lambda$  criterion = .43,  $F(12, 264.87) = 8.24, p < .001$ .

Accordingly, there was at least one significant relationship between the proposed expectation factors and the three measurements of actual E-learning usage. Wilks'  $\lambda$  represents the variance in the combination of dependent variables unexplained by the set of independent variables, 57 per cent (1-  $\lambda$ ) of variance in actual E-learning usage was accounted for by our proposed expectation variables (Sherry, and Henson 2005). The canonical correlation analysis yielded three functions with squared canonical correlations of .55, .04, and .007, respectively, for each successive function (see Table II).

**TABLE II**  
**CANONICAL CORRELATION ANALYSIS**  
**OF THE RELATIONSHIP BETWEEN THE FOUR**  
**EXPECTATION VARIABLES AND THE THREE**  
**MEASUREMENTS OF E-LEARNING USAGE**

Function	Eigenvalue	Canonical correlation	Squared correlation
1	1.21	.74	.55
2	.04	.20	.04
3	.007	.09	.007

Dimension reduction analysis was used to determine which functions should be interpreted (see Table III).

**TABLE III  
DIMENSION REDUCTION ANALYSIS  
FOR CANONICAL FUNCTIONS OF THE  
RELATIONSHIP BETWEEN THE FOUR  
EXPECTATION VARIABLES AND THE THREE  
MEASUREMENTS OF E-LEARNING USAGE**

Roots	Wilks' λ	F	Hypothesis DF	Error DF	Significance of F
1-3	.43	8.24	12	264.87	< .001
2-3	.95	.79	6	202	.58
3	.99	.37	2	102	.69

Functions 1 to 3 was statistically significant,  $F(12, 264.87) = 8.24, p < .001$ , however the cumulative effects of Functions 2 to 3 and Function 3 in isolation was not statistically significant. Because of this, the first function was considered noteworthy in the context of this study. There was a positive relationship between the dependent and the independent variates in the Function 1 since the canonical correlation between the dependent and the independent variates (.74) was positive. In canonical Function 1, with structure coefficients greater than .45, it can be concluded that all the four proposed expectation variables (PE, EE, SI, and FC) contributed to the Function 1-independent variate, while intention to use E-learning contributed to the Function 1-dependent variate (see Table IV). Because of this result, hypothesis H1, H2, H3, and H4 are all confirmed.

**TABLE IV  
CANONICAL SOLUTION OF THE  
RELATIONSHIP BETWEEN THE FOUR  
EXPECTATION VARIABLES AND THE THREE  
MEASUREMENTS OF E-LEARNING USAGE  
IN THE FUNCTION 1**

	Variables	Structure Coefficients	Summary
Independent	PE	.82	Contributing
	EE	.67	Contributing
	SI	.91	Contributing
	FC	.86	Contributing
Dependent	Intent	.98	Contributing
	Freq	.04	No
	Timespent	.11	No

In order to investigate whether or not individual cultural values can moderate the influence of expectation variables on E-learning usage (H5, H6, and H7), a mean-

split method was applied to categorise and divide each cultural variable into two groups (High and Low). In each group, multiple linear regression analysis between the focused expectation variable and the three measurements of actual E-learning usage (Intent, Freq and Timespent) was conducted. The multiple correlation coefficient from each group was then compared using the following procedure:

First, the multiple correlation coefficient (R) from each regression model was transformed using the Fisher's equation (1921):

$$Z_R = \frac{1}{2} \ln \frac{1+R}{1-R}$$

Then, a z-score of the difference between the two multiple correlation coefficients was computed:

$$Z_{\text{difference}} = \frac{Z_{R1} - Z_{R2}}{\sqrt{\frac{1}{N1-3} + \frac{1}{N2-3}}}$$

where

$Z_{R1}$  is the z-score of the multiple correlation coefficient from the first regression model.

$Z_{R2}$  is the z-score of the multiple correlation coefficient from the second regression model.

$N1$  and  $N2$  is the sample size of the first and second regression model, respectively.

Finally, a p-value for the computed  $Z_{\text{difference}}$  was obtained using the table of standard normal distribution.

The results showed that: (a) the multiple correlation coefficient between performance expectancy and the three measurements of actual E-learning usage between a group of high and low masculinity cultural value was statistically significantly different ( $R_{\text{difference}} = .36, p = .005$ ), supporting hypothesis H5; (b) the multiple correlation coefficient between effort expectancy and the

three measurements of actual E-learning usage between a group of high and low uncertainty avoidance cultural value was not statistically significantly different (R difference = .12,  $p = .21$ ), rejecting H6; and (C) the multiple correlation coefficient between social influence and the three measurements of actual E-learning usage between a group of high and low collectivism cultural value was not statistically significantly different (R difference = .10,  $p = .20$ ), hypothesis H7 was not accepted, see Table V.

**TABLE V**  
**Z-SCORE COMPARING MULTIPLE**  
**CORRELATION COEFFICIENTS OF THE**  
**RELATIONSHIP BETWEEN FOCUS**  
**EXPECTATION VARIABLE AND E-LEARNING**  
**USAGE BETWEEN GROUP OF HIGH AND**  
**LOW CULTURAL VALUE**

Hypothesis		Low Cultural Value		High Cultural Value		Z_diff	p-value
		R	N	R	N		
H5	PE × MAS → use	.34	57	.70	50	2.57	.005
H6	EE × UAI → use	.45	55	.57	52	.82	.21
H7	SE × COL → use	.59	59	.69	48	.85	.20

## V. DISCUSSION

This section discusses the statistical results from the model validation phase. In addition, the implications of the findings are suggested for higher education policy makers, practitioners and further studies.

### A. Factors Influencing the Use of E-Learning

The result of the canonical correlation analysis revealed that performance expectancy was a statistically significant contributing variable in the use of E-learning. This meant that a student who had a high level of expectation that usage of E-learning system could support him/her to learn more quickly and achieve better grades normally showed a higher level of use than a student with a low expectation. Several studies on higher education in Thailand and other countries have also revealed that performance expectancy plays an important role in influencing students' use of E-learning (Merhi, 2015). This was not a surprising finding since E-learning is viewed as technology that facilitates learning:

students will spend more time on this technology if they expect that E-learning helped them to learn better. This finding has important implications for E-learning system designers and developers in that the functionality of E-learning should provide facilitate learning effectively in order to encourage student users to learn more quickly and achieve better learning performance than other possible self-learning techniques. If the design and development of an E-learning system complies with this prerequisite, it can be expected that students will tend to spend more time using it.

The results confirmed that effort expectancy was a variable that contributed statistically significantly to the use of E-learning among students in higher education. This indicated that a student who had a high expectation that the use of E-learning system would be easy normally demonstrated a higher level of E-learning usage than a student with a low expectation. A similar finding has been reported by many studies concerned with E-learning use in higher education (Lee, 2006). A possible explanation might be that, if an E-learning system is too hard for students to use, the benefits of using it to learn faster may be dropped because of the time and effort needed to use the system. Eventually, students may be reluctant to use the system or may reduce the time spent doing so. The above finding has important implications for E-learning designers and developers that E-learning system should be designed to be easy to navigate and understand. When E-learning is designed and developed in a more user-friendly form, it may be expected that students will tend to use it, and spend more time doing so.

Social influence was a statistically significant contributing variable in the use of E-learning. This suggested that students will use and tend to increase their level of use if this is recommended and encouraged by their important persons such as parents, teachers and friends. A similar finding has been reported by many studies (Van Raaij and Schepers, 2008). Thai students strongly respect their parents and

teachers. In order to make a decision on something, Thai students normally ask advice from their parents or teachers. All of these points strongly support why social influence has the most significant impact on student's use of E-learning.

The results confirmed that facilitating conditions statistically significantly influenced the use of E-learning among students in HEIs, consistent with many previous studies (Chen, 2011). A possible reason why the facilitating conditions were important if Thai students were to use E-learning might be the Thai IT infrastructure. The problem of a lack of IT resources prevents many Thai students from use E-learning, and this might have been why the participants in our study confirmed that the facilitating conditions factor was important to their using. In order to increase the use of E-learning in Thai higher education, we cannot forget that not all Thai parents are able to provide their children with the necessary IT resources to use it, so the finding from this research would suggest that the Thai government should subsidize universities to provide the both the necessary IT infrastructure (such as computers, internet system) and the staff to assist with its use.

### ***B. The Moderate Effect of Individual Culture Values on the Use of E-Learning***

The relationship between performance expectancy and E-learning usage was moderated by masculinity cultural value such that the relationship was stronger for higher group ( $R_{\text{difference}} = .36$ ,  $p\text{-value} < .005$ ). This means that students with high masculine cultural values are more concerned with the usefulness of E-learning. This result was confirmed by the previous work by Srite, and Karahanna in 2006. A possible explanation might be that, those with high masculinity are more task-oriented and will emphasize work goals such as earning and promotions than those holding lower masculine value (Tarhini et al., 2017). There was no doubt why the students with high masculinity are more influenced by features that enhance the achievement of work goals compared to the lower group This finding has important

implications for E-learning stakeholders that students with high masculinity value focus more on the functionality of E-learning that encourage them to learn quickly and achieve good learning performance than other aspects. If the E-learning system complies with this prerequisite, it can be expected that students with high masculinity as a nature will tend to spend more time using it.

However, contrary to expectations the results did not support the moderate effect of uncertainty avoidance (hypothesis H6) and collectivism (hypothesis H7) on E-learning usage. In our study, the most of participants were experienced users. Prior experience with the system may have enabled this group of students to undertake E-learning easily without needing encouragement from other people. This might be why the moderate effect of culture were not found on effort expectancy and social influence factor.

## **VI. CONCLUSION**

E-learning cannot fully provide benefits to individual students and HEIs if the students who are the end users do not use the technology. To better explain E-learning usage, this research extended the UTAUT model by espousing national cultural values as an important set of individual difference moderators, and the aim was to construct the cultural model of E-learning usage.

The results confirmed that the proposed cultural model of E-learning usage could be applied in Thailand. All four key factors (performance expectancy, effort expectancy, social influence, and facilitating conditions) proposed by the model are contributing in the use of E-learning for the context of Thailand. Masculinity cultural value increases the impact of performance expectancy on the use of E-learning. Contrary to expectations, the moderate effect of uncertainty avoidance and collectivism on E-learning usage were not supported by the results of this study.

The cultural model of E-learning usage provided important results for research and



practice. The model has practical value for E-learning stakeholders in Thailand and other countries in terms of suggesting stakeholders to take corrective action or devoting more targeted effort to increase usage. From the review of literature, it was found that, no study has yet theoretically combined factors affecting IT usage and cultural value into a single model. The theoretical contribution of this study is the integration of culture into the technology acceptance model.

## REFERENCES

**(Arranged in the order of citation in the same fashion as the case of Footnotes.)**

- [1] Chen, J.L. (2011). "The effects of education compatibility and technological expectancy on e-learning acceptance". *Computers & Education*, 57(2), pp. 1501-1511.
- [2] Cronbach, L.J. (1951). "Coefficient Alpha and the Internal Structure of Tests". *Psychometrika*, 16(3), pp. 297-334.
- [3] Davis, F.D. (1985). "A technology acceptance model for empirically testing new end-user information systems: Theory and results (Doctoral dissertation, Massachusetts Institute of Technology)".
- [4] Davis, F.D. (1989). "Perceived usefulness, perceived ease of use, and user acceptance of information technology". *MIS quarterly*, pp. 319-340.
- [5] Fisher, R.A. (1921). "On the 'probable error' of a coefficient of correlation deduced from a small sample". *Metron*, 1, pp. 3-32.
- [6] Gliem, J.A. and Gliem, R.R. (2003). "Calculating, interpreting, and reporting Cronbach's alpha reliability coefficient for Likert-type scales". *Midwest Research-to-Practice Conference in Adult, Continuing, and Community Education*.
- [7] Hofstede, G. (1986). "Cultural differences in teaching and learning". *International Journal of intercultural relations*, 10(3), pp. 301-320.
- [8] Hofstede, H. and Hofstede, H.G. (1991). "Cultures and organizations: Software of the mind". McGraw-Hill, London.
- [9] Kanfer, R., Ackerman, P.L., Murtha, T. C., Dugdale, B., and Nelson, L. (1994). "Goal setting, conditions of practice, and task performance: A resource allocation perspective". *Journal of Applied Psychology*, 79(6), pp. 826-835.
- [10] Kroeber, A.L. and Kluckhohn, C. (1952). "Culture: A critical review of concepts and definitions". *Papers, Peabody Museum of Archaeology & Ethnology, Harvard University*.
- [11] Lai, C., Wang, Q., and Lei, J. (2012). "What factors predict undergraduate students' use of technology for learning? A case from Hong Kong". *Computers & Education*, 59(2), pp. 569-579.
- [12] Lee, Y.C. (2006). "An empirical investigation into factors influencing the adoption of an e-learning system". *Online Information Review*, 30(5), pp. 517-541.
- [13] Nunnally, J.C. (1978). "Psychometric theory". New York, McGraw-Hill.
- [14] Mathieson, K. (1991). "Predicting user intentions: comparing the technology acceptance model with the theory of planned behavior". *Information systems research*, 2(3), pp. 173-191.
- [15] McCoy, S., Galletta, D.F., and King, W. R. (2007). "Applying TAM across cultures: the need for caution". *European Journal of Information Systems*, 16(1), pp. 81-90.
- [16] McGill, T.J. and Klobas, J.E. (2009). "A task-technology fit view of learning management system impact". *Computers & Education*, 52(2), pp. 496-508.
- [17] Merhi, M.I. (2015). "Factors influencing higher education students to adopt podcast: An empirical study". *Computers & Education*, 83, pp. 32-43.
- [18] Pituch, K.A. and Lee, Y.K. (2006). "The influence of system characteristics on e-learning use". *Computers & Education*, 47(2), pp. 222-244.
- [19] Robichaux, B.P. and Cooper, R.B. (1998). "GSS participation: A cultural

- examination. *Information & Management*, 33(6), pp. 287-300.
- [20] Rosenberg, M.J. (2001). "E-learning: Strategies for delivering knowledge in the digital age". Vol. 9, New York: McGraw-Hill.
- [21] Sánchez-Franco, M.J., Martínez-López, F.J., and Martín-Velicia, F.A. (2009). "Exploring the impact of individualism and uncertainty avoidance in Web-based electronic learning: An empirical analysis in European higher education". *Computers & Education*, 52(3), pp. 588-598.
- [22] Sherry, A. and Henson, R.K. (2005). "Conducting and interpreting canonical correlation analysis in personality research: A user-friendly primer". *Journal of personality assessment*, 84(1), pp. 37-48.
- [23] Shin, S.K., Ishman, M., and Sanders, G. L. (2007). "An empirical investigation of socio-cultural factors of information sharing in China". *Information & Management*, 44(2), pp. 165-174.
- [24] Srite, M. (1999). "The influence of national culture on the acceptance and use of information technologies: An empirical study". *AMCIS*, 1999 Proceedings, pp. 355.
- [25] Srite, M. (2006). "Culture as an explanation of technology acceptance differences: An empirical investigation of Chinese and US users". *Australasian Journal of Information Systems*, 14(1).
- [26] Srite, M. and Karahanna, E. (2006). "The role of espoused national cultural values in technology acceptance". *MIS quarterly*, pp. 679-704.
- [27] Šumak, B., Heričko, M., and Pušnik, M. (2011). "A meta-analysis of e-learning technology acceptance: The role of user types and e-learning technology types". *Computers in Human Behavior*, 27(6), pp. 2067-2077.
- [28] Tan, P.J.B. (2013). "Applying the UTAUT to understand factors affecting the use of English e-learning websites in Taiwan". *Sage Open*, 3(4).
- [29] Tarhini, A., Teo, T., and Tarhini, T. (2016). "A cross-cultural validity of the E-learning Acceptance Measure (EIAM) in Lebanon and England: A confirmatory factor analysis". *Education and Information Technologies*, 21(5), pp. 1269-1282.
- [30] Tarhini, A., Hone, K., Liu, X., and Tarhini, T. (2017). "Examining the moderating effect of individual-level cultural values on users' acceptance of E-learning in developing countries: a structural equation modeling of an extended technology acceptance model". *Interactive Learning Environments*, 25(3), pp. 306-328.
- [31] Van Raaij, E.M. and Schepers, J.J. (2008). "The acceptance and use of a virtual learning environment in China". *Computers & Education*, 50(3), pp. 838-852.
- [32] Venkatesh, V., Morris, M.G., Davis, G. B., and Davis, F.D. (2003). "User acceptance of information technology: Toward a unified view". *MIS quarterly*, pp. 425-478.
- [33] Watson, R.T., Ho, T.H., and Raman, K. S. (1994). "Culture: A fourth dimension of group support systems". *Communications of the ACM*, 37(10), pp. 44-55.
- [34] Yoo, B. and Donthu, N. (2002). "The effects of marketing education and individual cultural values on marketing ethics of students". *Journal of Marketing Education*, 24(2), pp. 92-103.
- [35] Yoo, B., Donthu, N., and Lenartowicz, T. (2011). "Measuring Hofstede's five dimensions of cultural values at the individual level: Development and validation of CVSCALE". *Journal of International Consumer Marketing*, 23(3-4), pp. 193-210.
- [36] Yoon, C. (2009). "The effects of national culture values on consumer acceptance of e-commerce: Online shoppers in China". *Information & Management*, 46(5), pp. 294-301.