# Literature Review on Technology Acceptance Model: The Enhanced Variables of Venkatesh's UTAUT Model on Students' Acceptance of Use on Online Distance Learning

N.R.W. Mohamed [1,a)], D. Sharif [2,b)] and M. N. Muhayiddin[3,c)]

[1] *Faculty of Hotel and Touriasm Management, Universiti Teknologi Mara, Kampus Bandaraya Melaka, 75300 Melaka Malaysia*
[2]*Academy Contemporary Islamic Studies, Universiti Teknologi Mara, Kampus Bandaraya Melaka, 75300 Melaka Malaysia.*
[3] *Faculty of Entrepreneurship and Business University of Malaysia, Kelantan Universiti Malaysia Kelantan, City Campus, Pengkalan Chepa, 16100 Kota Bharu Kelantan Malaysia*

Corresponding author:[a)]rozilaini@uitm.edu.my
[b)]dziau646@uitm.edu.my
[c)]mnazri@umk.edu.my

**Abstract.** This paper detailed the unified theory of acceptance and use of technology (UTAUT) that has been used widespread in IT system and other areas, and the initiative of this paper is to introduce the UTAUT theory evidences and relation in online distance learning at universities. This paper reviewed the literature on UTAUT from multiple perspectives on theoretical analysis of UTAUT and its expansion and continuing for research going forward. Based on Venkatesh (2003), framework of theory evaluation, this paper continuing UTAUT and its extensions developed from few sets of constructs as the parts of a theory and as the whole theory. This review identifies many distinctions of UTAUT, progress related to this theory that has further development, and it relation to online distance learning at IPTA in Malaysia. This paper will allow a significant future work, the theoretical contributions of UTAUT using expanding and cross-context concept. Our conclusion reveals several limitations that lead other researchers to continue a UTAUT study framework that can serve as the theoretical foundation for future research.

## INTRODUCTION

The number of coronavirus disease is distressing the global even some countries have conducted clinical trials of vaccines, due to these The Minister of Higher Education in Malaysia have taken requisite policy to ensure safety of enrolling students. Online distance learning is implementing as a new shift in teaching and learning to minimizes social interaction. In universities, for example, lecturers have been instructed that ODL learning must be implemented. This causes lecturers to adapt to various online mechanisms as soon as possible. This situation certainly creates an ad-hoc atmosphere as this ODL teaching method should be implemented in the middle of the ongoing semester. However, the most critical question to answer is to what extent are the students accepting the ODL implementation conducted by the lecturers and the facilities provided by the administration when the pandemic comes to an end. This question is rarely answered precisely because the ODL implementation is no longer as optional as it was before the outbreak, but it is already a mandatory choice. This paper proposes a research on students' acceptance and use of information technology as it is established in sudden approach and a need to improved first online distance learning mechanism to achieve expected outcomes.

# COMPREHENSIVE REVIEWS IN LONGITUDINAL STUDIES ON TECHNOLOGY ACCEPTANCE MODELS

Researchers have suggested several models based on the theory of planned behavior (TPB) to clarify and predict consumer acceptance to use technology. According to [1] the unified theory of acceptance and use of technology (UTAUT) performance expectancy, effort expectancy, social influence, and facilitating conditions and forecasting behavioral intention to use a technology and satisfaction of usage in company environments. Effort by **[1]** to solve this problem is greatly welcomed among Information Science (IS) research circles. His team has introduced and tested the new and unified model, known as Unified Theory of Acceptance and Use of Technology (UTAUT) which integrates the eight (8) previous models used in technology acceptance studies. Due to comprehensiveness of its development, the UTAUT model has been chosen as the main model for this research. In this section, those eight established models are first reviewed in order to give a sense of appreciation why UTAUT model is believed to be the most appropriate model for this study of electronic dinar payment system. Those eight models are: Theory of Reasoned Action (TRA), Technology Acceptance Model (TAM), Motivational Model (MM), Theory of Planned Behavior (TPB), a model which combines TAM and TPB (C-TAM-TPB), Model of PC Utilization (MPCU), Innovation Diffusion Theory (IDT), and Social Cognitive Theory (SCT). A brief explanation for each model is given below.

## Theory of Reasoned Action (TRA)

The theory is developed by [2] which is drawn from social psychology studies. TRA is believed to be the most fundamental theories of human behavior [1]. According to TRA, the behavior of a person is determined by his or her behavioral intention (BI) to perform the behavior. BI is determined by two variables i.e. attitude toward behavior and subjective norm concerning the behavior and it is a measure of how much influence the intention of a person to perform such behavior [2]. The core constructs of TRA are as per explained in Table 1 below.

**TABLE 1.** TRA Core Constructs.

| Core Constructs | Definitions |
| --- | --- |
| Attitude Toward Behavior | "an individual's positive or negative feelings (evaluative affect) about performing the target behavior" [2], p. 216). |
| Subjective Norm | "the person's perception that most people who are important to him think he should or should not perform the behavior in question" [2] p. 302). |

## Technology Acceptance Model (TAM)

Developed by [3], TAM is an adaptation from TRA and it is specifically tailored for information systems (IS) usage. The main goal for TAM is to determine what causes a person to accept or reject information technology Armida [4]. TAM suggests that two determinants, perceived usefulness and perceived ease of use, are primarily relevance to the understanding of computer acceptance behaviors. Definition of the two determinants is provided in Table 2 below.

**TABLE 2.** TAM Core Constructs.

| Core Constructs | Definitions |
| --- | --- |
| Perceived Usefulness | "the degree of which a person believes that using a particular system would enhance his or her job performance" [5]. |
| Perceived Ease of Use | "the degree of which a person believes that using a particular system would be free of effort" [5], p.320). |

# Motivational Model (MM)

Several studies have adopted motivational theory in order to explain how people respond in different contexts [5,6,7]. Most of the studies in motivational theory agree that human is bounded by two types of motivation i.e. intrinsic and extrinsic.

These two determinants become the basis of the MM constructs. In the context of information system research, [5] had applied motivational theory to understand adoption and usage behaviors of a new technology. Their research found out that both determinants (intrinsic and extrinsic motivation) are proven to be the key drivers for a person's intention to use new technology. The core constructs for MM are explained in Table 3.

**TABLE 3.** MM Core Constructs.

| Core Constructs | Definitions |
|---|---|
| Intrinsic Motivation | Users would want to perform an activity "for no apparent reinforcement other than the process of performing the activity per se" [5] p. 1112. It involves the pleasure and satisfaction related to performance coming from the activity itself. |
| Extrinsic Motivation | Users would want to perform an activity "because it is perceived to be instrumental in achieving valued outcomes that are distinct from the activity itself, such as improved job performance, pay, or promotions" [5] p.4. |

# Theory of Planned Behavior (TPB)

TPB is an extended version of TRA with addition of perceived behavioral control as a new construct Ajzen [8]. Perceived behavioral control is posited to be another variable that determines intention and behavior. TPB argues that in order to execute any behavior, a person shall be in control of the possibility to execute that behavior. TPB has been successfully tested and applied in several technology adoption studies [9,10]. Table 4 below illustrates the core constructs for TPB.

**TABLE 4.** TPB Core Constructs.

| Core Constructs | Definitions |
|---|---|
| Attitude Toward Behavior | Adapted from TRA |
| Subjective Norm | Adapted from TRA |
| Perceived Behavioral control | 1) It refers to "the perceived ease or difficulty of performing the behavior" [8], p. 188). 2) In IS research context, it refers to "perceptions of internal and external constraints on behavior" [10], p. 149). |

# Combined of TAM and TPB Model (C-TAM-TPB)

This model is a hybrid in a sense that it combines the constructs of TPB with that of "perceived usefulness" from TAM. Several researches have combined TPB and TAM in order to evaluate variables from both models and identify which factors exert more impact [9,10]. The core constructs are listed is shown in Table 5.

TABLE 5. C-TAM-TPB Core Constructs.

| Core Constructs | Definitions |
|---|---|
| Attitude Toward Behavior | Adapted from TRA/TP |
| Subjective Norm | Adapted from TRA/TPB |
| Perceived Behavioral control | Adapted from TRA/TPB |
| Perceived Usefulness | Adapted from TAM |

## Model of PC Utilization (MPCU)

This model is introduced by [11] having adapted it from Triandis, (1977) theory of human behavior. They refined the Triandis' model for IS usage and used the model to study behavior of PC utilization as mentioned by [11]. According to Venkatesh.V., et al. [1], the nature of MPCU model makes it particularly suited to study individual acceptance and adoption of various information technologies. Table 6 explains the core construct for this MPCU model.

TABLE 6. MPCU Core Constructs

| Core Constructs | Definitions |
|---|---|
| Job-fit | "the extent to which an individual believes that using [a technology] can enhance the performance of his or her job" [12] p. 129). |
| Complexity | "the degree of which an innovation is perceived as relatively difficult to understand and use" [12], p.128). |
| Long-term Consequences | "these are outcomes that have a pay-off in the future, such as increasing the flexibility to change jobs or increasing the opportunities for more meaningful work" [12] p. 129). |
| Affect Towards Use | "feeling of joy, elation, or pleasure, or depression, disgust, displeasure, or hate associated by an individual with a particular act" [12], p. 127). |
| Social Factors | "the individual's internalization of the reference group's subjective culture, and specific interpersonal agreements that the individual has made with others, in specific social situations" [12] p. 126). |
| Facilitating Conditions | In IS research context, this construct refers to the "provision of support for users of PCs may be one type of facilitating condition that can influence system utilization" [12] p. 129). |

## Innovation Diffusion Theory (IDT)

Since 1960s, IDT [12] has been used to study various innovation elements in several fields of studies. [12] insisted that each innovation is unique in a sense that some new technologies require only a few years to be successfully adopted whereas others may require much longer time.

The element of attributes as perceived by an individual may explain why different innovations require different rate of adoption. Within the sphere of IS research, [13] adapted Rogers' initial model and refined it in order to suit individual technology acceptance studies. These core constructs of IDT are provided in Table 7 below.

TABLE 7. IDT Core Constructs.

| Core Constructs | Definitions |
| --- | --- |
| Relative Advantage | "the degree of which an innovation is perceived as being better that its precursor" [15] p. 195). |
| Ease of Use | "the degree of which an innovation is perceived as being difficult to use" [15] p. 195). |
| Image | "the degree of which use of innovation is perceived to enhance one's image or status in one's social system" [15] p. 195). |
| Visibility | The degree of which usage of the system in the organization can be visibly observed by others [15] . |
| Compatibility | "the degree of which an innovation is perceived as being consistent with the existing values, needs, and past experiences of potential adopters" [15] p. 195). |
| Results Demonstrability | "the tangibility of the results of using the innovation, including their observability and communicability" [15], p. 203). |
| Voluntariness of Use | "the degree of which use of the innovation is perceived as being voluntary, or of free will" [15] , p.195). |

## Social Cognitive Theory (SCT)

Social cognitive theory is among the most influential theories in human behavioral studies see [14]. In [15], SCT is further developed to study the IS research in computer utilization. Although [15] model is initially developed for the study of computer usage, the common fundamental theory embedded inside it, would allow it to be used in the study of acceptance and use of information technology as well. The core constructs for SCT are defined as in Table 8.

TABLE 8. SCT Core Constructs

| Core Constructs | Definitions |
| --- | --- |
| Outcome Expectation-Performance | Based on [15], "performance expectations deal with job-related outcomes" [1] p. 432). |
| Outcome Expectation -Personal | Based on [17], "personal expectations deal with the individual esteem and sense of accomplishment" [1] p. 432). |
| Self-efficacy | "Judgment of one's ability to use a technology (e.g., computer) to accomplish a particular job or task" [1] p. 432) |
| Affect | "An individual's liking for a particular behavior (e.g., computer use)" [1] p. 432). |
| Anxiety | "Evoking anxious or emotional reactions when it comes to performing a behavior (e.g., using a computer)" [1], p. 432). |
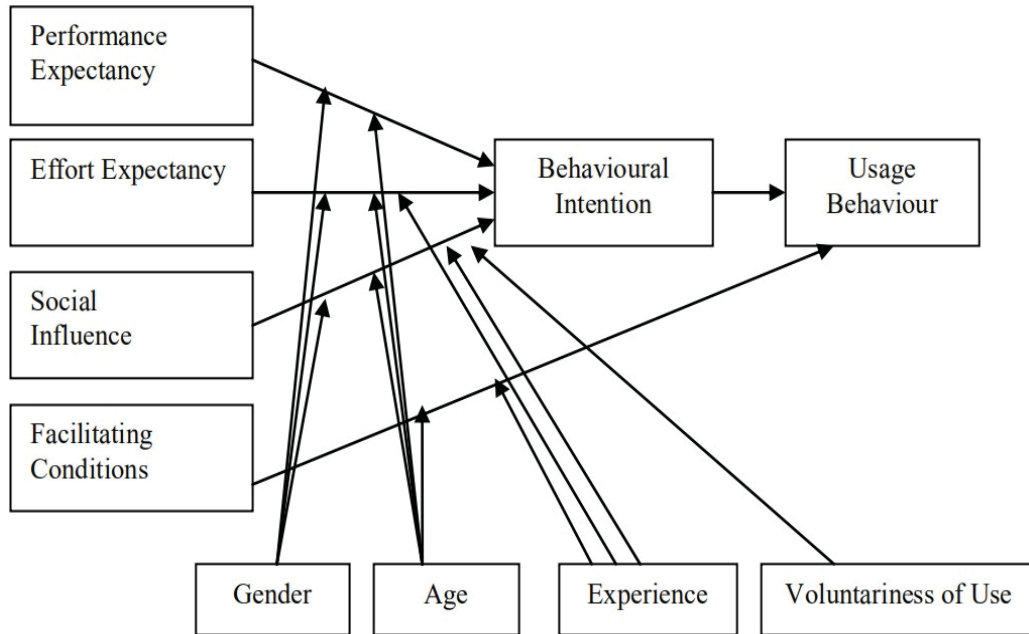
**FIGURE 1.** UTAUT Model (Venkatesh et al., 2003).

The research framework for this work is adapted from UTAUT with three (3) additional variables added. This study intends to find out the technology acceptance of electronic dinar payment system based on the four original constructs of UTAUT model. Those original constructs are performance expectancy, effort expectancy, social influence, and facilitating conditions. This research also intends to find out how significant is the contributions of moderators in this case. Out of four moderators in the original UTAUT model, only three have been applied in this study. Those three moderators are gender, age, and experience while the fourth moderator (voluntariness of use) is not included since the proposed electronic dinar payment system would be purely voluntary in nature and therefore its purpose is irrelevant in this case. The three (3) additional variables are added i.e. attitude towards using, perceived credibility, and anxiety. The three (3) variables are hypothesized to be very relevant to this study and therefore their influence is expected to be significant in the proposed research framework. Attitude towards using is adapted from [16], and [10]

## SYNTHESIS OF UTAUT MODELS REFERED FROM VENKATESH (2003)

Figure 2 shown a level of UTAUT model framework and emphasizes the essential fields for future research that further investigation to improve online distance learning mechanism. The proposal of our research highlighted parts which has extended from UTAUT [1]. The macro represents education attributes include e-learning, online distance learning, the use of mobile phone for education which involve in schools, government or private universities. Second is organization attributes which also conceptual in a way of for traditional conditions which can effect organization financial, leadership, culture and human resource training and skills and the third is geographical such as peripheral locations , urban or rural areas might reflect the companies to use technology because of competition, accessibility, cost of operation and logistic. The bottom part focusing on individual or micro level which include age, gender, experience, psychological aspect such as trust, perception and expectation of the users that might cause the behavior intention to use technology and reflect their satisfaction level of usage.
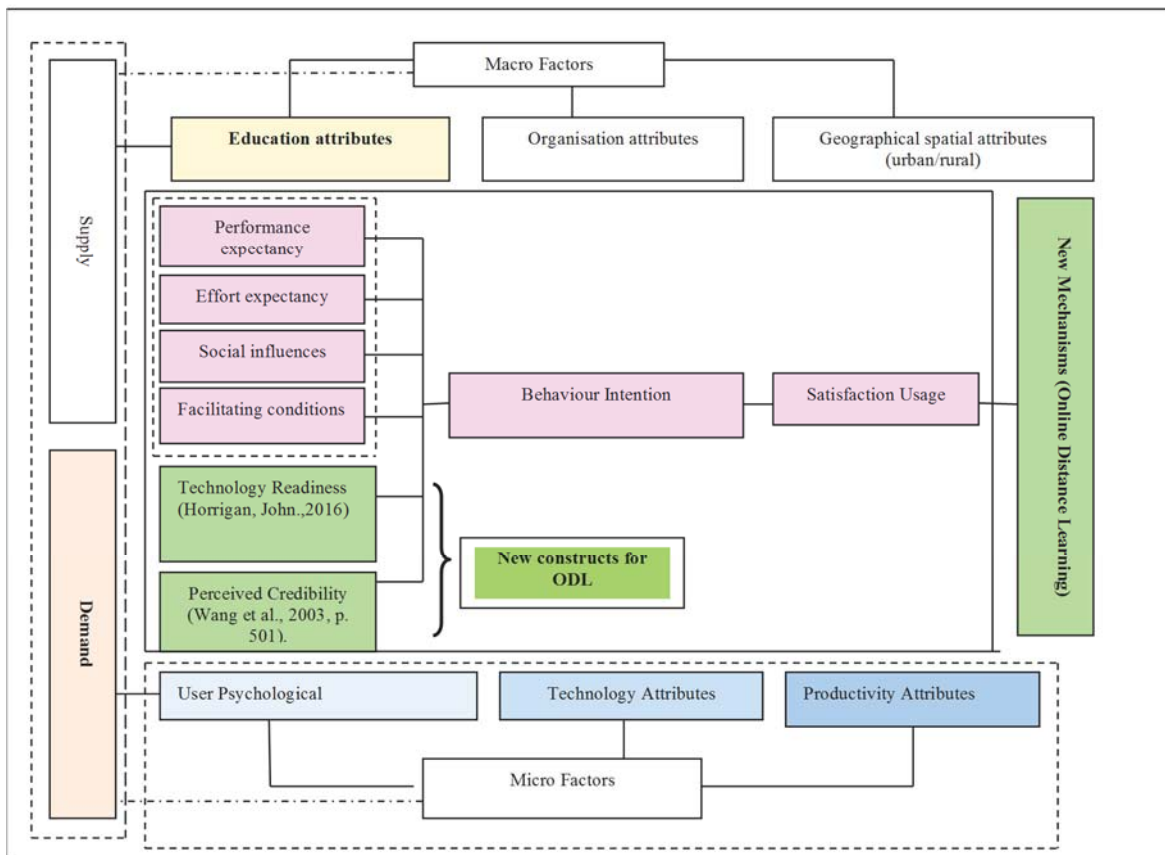
**FIGURE 2.** A UTAUT Framework of Technology Acceptance Use

## RECOMMENDED FOR RESEARCH PROPOSAL

This literature review focus on UTAUT extensions that has the highest capability for making significant theoretical contributions to online distance learning and the students' acceptance on technology use (Table 9). The [1] page 451 as the foundation for our analysis because it provides organized framework, and which is a good match online distance learning research objective. This literature identifies the future research directions for further development of theories of technology acceptance and use.

**TABLE 9.** A UTAUT Core Constructs for Online Distance Learning.

| Core Constructs | Explanations |
|---|---|
| Effort Expectancy | "the degree of ease associated with the use of the system" [1] p. 450). **(In this work)** The acceptance that using ODL system will benefit its user in terms of uploading/downloading materials |
| Facilitating Conditions | 'the degree to which an individual believes that an organizational and technical infrastructure exists to support use of the system" [1](Venkatesh et al., 2003, p. 453). (In this work) External factors to accomplish the acceptance of ODL system such as IT infrastructures, campaigns, cost, universities initiatives and others. |

**TABLE 9.** A UTAUT Core Constructs for Online Distance Learning (Continued…).

| Core Constructs | Explanations |
|---|---|
| Perceived Credibility | "the users security and privacy concerns in the acceptance of Internet banking" [17] p. 501. <br> **(In this work)** <br> Refers to the data security and privacy, misuse of data, the safety of materials' storage. |
| Performance Expectancy | "the degree to which an individual believes that using the system will help him or her to attain gains in job performance" [1], p. 447. <br> **(In this work)** <br> The perception that using ODL system will benefit its user in terms of mastering online implementation, materials preservation, and knowledge capability. |
| Social Influence | "the degree to which an individual perceives that important others believe he or she should use the new system" [1]p. 451. <br> **(In this work)** <br> The social pressure which influences students to use ODL system |
| Technology Readiness | Includes several things: digital skills, namely, the skills necessary to initiate an online session, surf the internet and share content online; trust, namely, people's beliefs about their capacity to determine the trustworthiness of information online and safeguard personal information [18]. <br> **(In this work)** <br> The skills necessary to initiate an ODL session, surf the internet and share content online; trust, the beliefs about their capacity to determine the trustworthiness of information online and safeguard personal information |

# ACKNOWLEDGMENTS

# REFERENCES

1. V. Venkatesh, M. G. Morris, G. B. Davis and F. D. Davis. MIS Quarterly 27, 425-478 (2003).
2. M. Fishbein and I. Ajzen. "Belief, Attitute, Intention and Behavior: An Introduction to theory and Research" (Reading: Addison-Wesley, 1975).
3. F. Davis and R. Bagozzi. Manage. Sci. 35, 982-1003 (1985).
4. E. E. Armida. "Adoption process for VOIP: The influence of trust in the UTAUT model" (PhD, Purdue University Garduate School, 2008).
5. F. D. Davis, R. P. Bagozzi, and P. R. Warshaw. J. Appl. Soc. Psychol. 50, 1111-1132 (1992).
6. R. J. Vallerand. Adv Exp Soc Psychol. 29, 271-360 (1997).
7. V. Venkatesh and C. Speier. Organ Behav Hum Decis Process. 79, 1-28 (1999).
8. I. Ajzen. Organ Behav Hum Decis Process.199150, 179-211 (1991).
9. K. Mathieson. Inf. Syst. Res. 2, 173-239 1991.
10. S. Taylor and P. A. Todd. Inf. Syst. Res. 6, 144-176 (1995).
11. R. Thompson, C. Higgins and J. Howell. MIS Quarterly 15, 125-143 (1991).
12. E. M. Rogers. Addict. Behav. 27, 989-993 (2002).
13. G. C. Moore and I. Benbasat. Inf. Syst. Res. 2, 173-239 (1991).
14. A. Bandura. "Social foundations of thought and action: A social cognitive theory" (Washington, D.C.: Prentice-Hall, Inc, 1986).
15. D. R. Compeau and C. A. Higgins. MIS Quarterly 19, 189-211 (1995).
16. F. D. Davis. MIS Quarterly 13, 319-339 (1989).
17. Y. S. Wang and Y. M. Wang. INT J SERV IND MANAG 14, 501-519 (2003).

18. J. B. Horrigan. "Lifelong learning and technology" (Washington, District of Columbia: Pew Research Center, 2013).