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# Extend of TAM Model with Technology anxiety and Self-Efficacy to Accept Course websites at University Canada West

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**Abstract.** Learning technology is the use of technology to support the learning process - widely known as e-learning. In higher education, this term refers to educational web sites such as online courses. The acceptance of technology in the learning process depends on some crucial factors. This research paper investigated the relationship among several variables that are related to educational technology performance based on the technology acceptance modal (TAM). The respondents were 61 students who are studying in the University Canada West (both undergraduate and postgraduate). Descriptive, correlation and multiple regressions were conducted to date. The results of the investigation showed that there was a positive correlation relationship among variables except of one variable, technology anxiety that was not correlated with the others. The multiple regressions resulted that two of independent variables, perceived of ease and self-efficacy, had a significant positive effect on the intention of use.

**Keywords:** *Perceived usefulness, Perceived ease of use, intention to use, technology anxiety, and self-efficacy.*

## 1. Introduction

Learning technology is the use of technology to support the learning process - widely known as E-learning. In higher education, this term refers to educational web sites such as online courses. However, managing online courses in terms of system planning, friendly design for users, and end-users' participation are recognized as the most crucial factors among student's satisfaction and acceptance. Furthermore, technology is more than just a tool for delivering information or transporting knowledge to students. In the hands of knowledgeable and confident students, technology increases desired learning outcomes, and can support students in constructing knowledge. Hence, E-learning is basically any method of education that is assisted by the Internet and its technologies and includes the use of the World Wide Web to support instruction and to deliver course content (Masrom, 2007). Alavi and Leidner (2001) pointed out that E-learning represents one form of technology-mediated learning, which is defined as "an environment in which the learner's interactions with the e-learning materials…,peers, and/or instructors is mediated through advanced information technologies". However, the effectiveness of the E-learning system will definitely depend on students' keen to work and use the system (Tarhini et al., 2017). Scholars have carried out several studies in E-learning based on Technology Acceptance Model (TAM) and have worked on the extension of TAM model with other variables in different countries and contexts (Hanif et al., 2018, Sylvia& Abdurachman, 2018, Al-Adwan & Smedley, 2013).

Many universities inevitably make an investment in technology in order to achieve competitive advantage. Information technology is widely used not only in the workplace but also in many places such as home and public areas (Johnson & Marakas, 2000). Petridis (2002) stated that information technology is already considered an important role in organizations, more specifically in universities, as higher educational institutions endeavor to sustain goals of quality, efficiency, and effectiveness. The internet has become the most useful technology for communicative and receiving information for countries, organizations, and individuals. It becomes an interconnected network of networks (Ramayah and

Ignatius, 2005) and provides connections among millions of computers and users around the world by providing many interesting services inexpensively (Davison, Burgess, and Tatnall, 2003). Online courses have become an annotative and pervasive inspiration among many universities for providing a new technology method that helps students enter universities far away from the classrooms and instructors. Therefore, according to (Salloum & Shaalan, 2018), "Understanding of end-user acceptance process is basically required to effectively implement the E-learning" (p.470).

University Canada West is providing a flexible choice for students to continue their study without regularly attending classes at its campuses. However, the implementation of courses online is not dependent only on the implementation of technology; rather, students have a role in terms of their interaction towards the course websites that were intended to complement their face-to-face classroom learning(hall,2008). Therefore, investigating the students' perception towards to E-learning system (perceived usefulness and perceives ease of use) provided by the university as well as their efficacy and anxiety towards their intention to use the E-learning system is the main objective of this study. Furthermore, this study addresses the following research questions.

Is there any correlational relationship between independents factors and dependent factor?

Is there any predictive relationship between independents factors and dependent factor?

## 2. Theoretical Approach

The technology acceptance model (TAM) that was developed by Davis (1989) is used to address why users accept or reject an IT system and how user acceptance is influenced by other external factors such as a student's characteristic use of computer in E-learning. This helps the system designers, developers, and end-users to get better user acceptance of the system in the location through the design choices of the system (Davis, Bagozzi, and Warshaw, 1989).

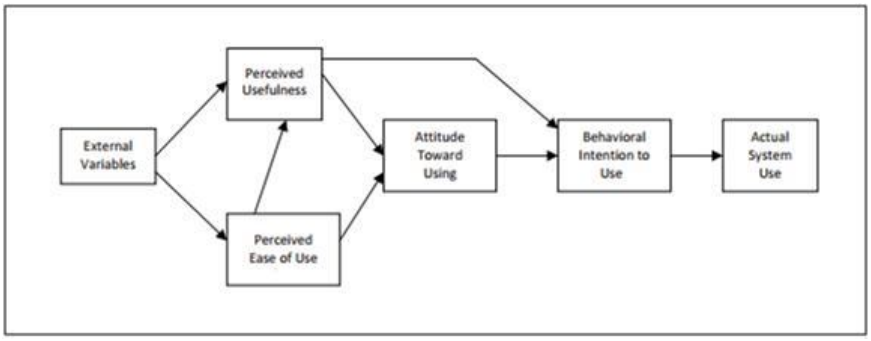


**Figure 1. Technology Acceptance Model (TAM) by (Davis, 1989).**

The model addresses two factors affecting usage that is defined as perceived usefulness which is " the degree to which a person believes that using a particular system would enhance his/her job performance" and " perceived ease of use which is " the degree to which a person believes that is using a particular system would be free of physical and mental efforts" (Davis et al., 1989,p.320). The ultimate aim of TAM is "to provide an explanation of the determinants of computer acceptance that is general, capable of explaining user behavior across a broad range of end-user computing technologies and user populations while at the same time being both parsimonious and theoretically justified" (abdi, p, 985). The Model contains vital variables of user motivation (i.e., perceived ease of use, perceived usefulness, and attitudes toward technology) and outcome variables (i.e., behavioral intentions, technology use). The variables of perceived usefulness (PU) and perceived ease of use (PEU) are considered crucial factors that directly or indirectly explain the consequences (Martin et al.2001). In investigating the factors that contribute to the adoption of E-learning among students, we applied the TAM model in this study.

In order for educational technology to be implemented in sufficient ways, students require to contact with that technology for curricular use. Other variables were significantly related to TAM vital factors. These variables showed the personal ability to accept the technology. With high computer self-efficacy,

students may be more persistent in finding ways to incorporate educational technology in authentic learning experiences. However, high computer–self-efficacy can be considered to be an important factor (Hall, 2008). Yujongh and Mun (2002) stated that self-efficacy is a dynamic relationship between cognitive, personal factors and environment which affects human behavior. To extend the TAM, the self-efficacy factor was found to significantly influence other variables in the model in different E-Systems (E-travel, E-banking, e-learning (Fauziah, 2014, Ariff et al., 2012, and Chen, 2014) respectively. In E-learning discipline, one's self-efficacy and technological acceptance were found to be relating to his online learning performances (Chen, 2014). Learning through Virtual environment would increase individuals' self-efficacy in real life. Students who are more interested to take E-learning courses have higher self-efficacy in technology and subjects' contents than those who are taking face to face courses (Wang et al. 2002). E-learning environment is more attractive and interesting.

The other emotional aspect of technology usage is called computer anxiety. Computer anxiety is defined as an individual's apprehension or fearing when she/he is faced with the possibility of using computers (Simonson et al. 1987). Computer anxiety is similar to self-efficacy that it relates to users' general perceptions about computer use. While self-efficacy relates to judgments about ability, computer anxiety is a negative affective reaction toward computer use. However, these personal factors provide the ability to control users' thoughts, feelings, and efforts. Therefore, behavior can be viewed as an external demonstration of internal beliefs that helps in achieving tasks. The TAM model had emphasized the importance of perceived technology anxiety. It was found a strong relationship between the antecedents for perceived ease of use (PEOU) and computer anxiety (Hoong et al., 2017, Saade et al., 2006). Anxiety has been observed as a personality factor in the information system which impacts system use (Agarwal & Karahanna, 2000). Previous studies have confirmed that high levels of computer anxiety decrease levels of self-efficacy that influences computer performance (Saade and Kira, 2009).

## 3. Method

### 3.1. Source of Data

Data was collected using a questionnaire survey at University Canada West. The respondents were registered in the university programs and they might conduct their program in online, on-ground, or mixed mode.

### 3.2. Proposal Model

The study framework presented in the figure is proposed. The independent variables are perceived usefulness, perceived ease of use, computer anxiety, and specific self- efficacy. The dependent variable is the intention to use. The study was conducted with regression analysis techniques.

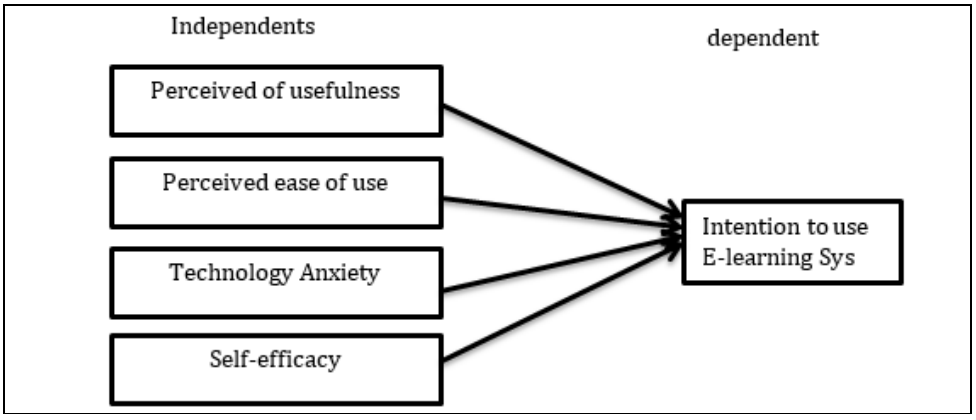


**Figure 2. Model to be tested.**

### 3.3. Measures

The technology acceptance model (TAM) scales of perceived usefulness, perceived ease of use, and computer actual usage were measured using items adapted from Davis (1989) and Davis et al. (1989). The specific self- efficacy was measured using items adapted from Johnson and Marakas (2000). Technology anxiety was measured using items originally developed as a computer anxiety scale, focusing on personal computers (Raub, 1981).

## 4. Results

### 4.1. Reliability

Cronbach's alpha was used to assess the reliability of constructs. The alpha measured were 0.92 for perceived usefulness, 0.914 for perceived ease of use, 0.937 for technology usage, 0.615 for technology anxiety, and 0.927 for self- efficacy. These values are all greater than the minimum of 0.6 required for constructs to be reliable. Table 1 shows the details.

| Variables | Cronbach's Alpha | Number of Items |
|---|---|---|
| Perceived of usefulness | .902 | 6 |
| Perceived ease of use | .9-14 | 6 |
| Intention to use | .831 | 3 |
| Technology Anxiety | .615 | 9 |
| Self-efficacy | .927 | 6 |

**Table 1. Reliability.**

### 4.2. Descriptive Statistics

Mean and standard deviations for all variables were determined as shown in table 2. The highest mean 4 was than on a scale of 1 to 5, for the self–efficacy and 3.8 for the dependent variable (intention to use). This means that the whole students indicated that were familiar to use technology with more self-efficacy. Perceived usefulness and ease of use course website were 3.4 & 3.5 respectively which indicated students perceived the university system to be easy to use and understood able. The lowest mean was technology anxiety, 2.8, that indicated students were more confident to use the technology.

| Variables | N | Min | Max | Mean | Std.D |
|---|---|---|---|---|---|
| Perceived of usefulness | 61 | 1.76 | 5.00 | 3.40 | .85 |
| Perceived ease of use | 61 | 1.76 | 5.00 | 3.52 | .86 |
| Intention to use | 61 | 1.88 | 5.00 | 2.87 | .52 |
| Technology Anxiety | 61 | 1.76 | 5.00 | 3.81 | .83 |
| Self-efficacy | 61 | 1.17 | 5.00 | 3.98 | .95 |

**Table 2. Descriptive Statistics.**

### 4.3. Correlational Relationship

Correlation relationship was presented in table 3. The correlation coefficient describes the degree of relationship between two variables. Independents variables showed a positive significant relationship among each other. However, the (independents variables) did show any significant relationship with the Intention to use E-learning system variable. All relationships were positive significant at p<.001.

| Variables | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| Perceived of usefulness | **1** | | | | |
| Perceived ease of use | .578** | **1** | | | |
| Intention to use | -.052 | -.091 | **1** | | |
| Technology Anxiety | .505** | .571** | -.121 | **1** | |
| Self-efficacy | .560** | .598** | -.050 | .585** | **1** |

Note: correlation is significant at $p < .001$

**Table 3. Correlational relationship.**

### 4.4. Predictive Relationship

To answer the second research question two, multiple linear regression analysis was used to assess the influence of independent variables on the dependent variable. Multicollinearity was checked that would cause a problem to contact the regression technique. If the variance inflation factors (VIFs) for the independent variables were greater than 10, the multicollinearity could unduly influence the results of the regression analysis as suggested by many researchers. The VIFs were less than 2 for all independent variables. The result of regression analysis in table 4 showed a significant model at Sig-F=.000 at P<.001.

| Variables | Beta | P-value |
|---|---|---|
| Perceived of usefulness | .243 | .051 |
| Perceived ease of use | .288 | .029* |
| Technology Anxiety | .025 | .794 |
| Self-efficacy | .301 | .017* |
| R Square | | .483 |
| Sig-F | | .000 |

*$p < .05$, **$p < .01$

**Table 4. Predictive relationship.**

## 5. Discussion and Conclusion

By looking to correlation relationship results, there are no significant correlational relationships between independents variables and dependent variable, although it existed among each one in all independents. Another analysis (regression analysis) was done to examine another relationship (predictive relationship) among the variables. The results revealed that perceived ease of use and self-efficacy (β =.288, P .029 & β =.301, P =. 017) respectively were found to be significant whereas the other two variables, perceived usefulness, and technology anxiety were not significant. The intention of use can result from perceived ease of use. This means that individuals are more influenced by the ease of using the system rather than of the usefulness of the system. The strong influence of self-efficacy indicates that students were more confident in using technology (Sylvia & Abdurachman, 2018; Hall, 2008).

This indicates that individuals adopt a new information system which is crucial in shaping acceptance, ease of use than perceived usefulness. Hence, considering the ease of use influences the user toward the use of the information system seems important for acceptance behavior (Davis et al., 1989; Yujong & Mun, 2002). However, computer anxiety has no more impact on individuals which means using computers is a normal issue and it has no longer negative impact on anyone.

Knowledge about the interaction between computer anxieties, computer self-efficacy, perceived of usefulness, and perceived ease of use and intention of using E-learning system is of interest to E-learning system designers and builders in the university Canada west. They can use these findings to enhance their understanding of what makes learners perform better while using E-learning system. To sum up, this study viewed that students would use the system if they find it to be easy to use coupled with their self-efficacy of using technology in the E-learning environment.

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