

Learners' Attitude toward E-Learning: The Effects of Perceived System Quality and E-Learning Usefulness, Self-Management of Learning, and Self-Efficacy

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Abstract: *The coronavirus pandemic has brought about dramatic changes in education, evidenced most clearly by the increase in e-learning. Thus, to identify how learners' attitudes toward e-learning are affected by diverse factors, this study examined the effects of perceived system quality and usefulness, the self-management of learning, and self-efficacy. A total of 236 college students participated in the survey. Multiple regression analysis was performed to test the study's proposed hypotheses. The study findings suggested that learners' attitudes toward e-learning are positively influenced by perceived e-learning usefulness, self-management of learning, and self-efficacy. However, the perceived system quality had no influence and no statistical significance.*

Keywords: Perceived System Quality, Perceived E-Learning Usefulness, Self-Management of Learning, Self-Efficacy, Attitude toward E-Learning

1. Introduction

The COVID-19 pandemic has changed many aspects of our daily lives. In fact how we live may be never be the same, according the predictions of many sources. This is especially true for how we learn. With schools shut down across the world, millions of students—from kindergarteners to grad students—have had to adapt to new types of learning [1]. As for learning modes, online learning has quickly become the new normal. Even before COVID-19, online education was showing high growth and adoption. In 2019, for instance, global investment in online learning reached US\$18.66 billion. Some [1] have projected that by 2025 the overall online education market to reach US\$350 billion. COVID-19, it would seem, has accelerated edtech's adoption of online education.

Like other countries around the world, South Korea responded to the pandemic by switching to online education for hundreds of thousands of students. The COVID-19 pandemic has brought about a much-needed revolution in education. Whether they were ready or not, during the first semester of 2020 schools in Korea had to give instruction online only. Most schools currently, in an effort to keep minimal the number of students in physical classrooms, are offering classes both online and offline [2]. Depending on how the pandemic conditions evolve, universities in Korea will likely extend online courses and reduce the number of face-to-face courses.

It seems then that until the virus is completely under control, online education is unavoidable. Yet it still poses a great deal of concerns in terms of quality and effectiveness. It certainly faces significant challenges—overcoming the lack of human connection, generating opportunities for collaborative learning, and stimulating more teacher supervision. Thus, this study will examine what factors influence learners' attitude toward e-learning. Factors include the following: perceived system quality, perceived usefulness, self-management of learning, and self-efficacy. In this study, perceived system quality and perceived e-learning usefulness are included as technology dimension whereas self-management of learning and self-efficacy are included as

learner dimensions. Findings of this study will shed some light on how educators can enhance effectiveness of online learning.

2. Literature Review

2.1 Definition of E-Learning: Advantages & Disadvantages

The term e-learning has often been used interchangeably with such terms as online learning, technology enhanced learning, and distance learning. E-learning is defined as the acquisition and use of knowledge distributed and facilitated by electronic means [3]. Another study defines e-learning as “an innovative approach for delivering well-designed, learner-centered, interactive, and facilitated learning environment to anyone, anyplace, anytime by utilizing the attributes and resources of various digital technologies along with other forms of learning materials suited for open, flexible, and distributed learning environment,” [4]. The first definition focuses on perspectives on pedagogy as well as content and access whereas the second one focuses on knowledge acquisition.

The advantages and disadvantages of e-learning, which has been used extensively in higher education, have been discussed in prior research [5-10]. Proponents argue that e-learning is cost-effective for students, as they need not travel, as well as for institutions, as it reduces the need for physical classrooms [6]. Students can work on the course just about anywhere they have a computer and Internet access [9]. They can even interact with learners through discussion forums and through eliminating the barriers that might hinder participation [7]. Critics argue that e-learning limits the social interaction between learners and instructors and between other learners [7]. With the limited opportunities for face-to-face interaction, researchers suggest that e-learning might have a negative impact on the development communication skills of learners [5, 8]. When compared to face-to-face learning, e-learning may be less effective in terms of aspects clarification and explanation [10]. In addition, an ethical issue such as cheating is more likely to occur in an e-learning environment since online tests could possibly be taken by a proxy [11].

2.2 Perceived System Quality

Learners' satisfaction with online learning is affected by how they perceive the quality of the system [12]. System quality may be defined as the degree to which a system meets expectations. Factors which influence the characteristics of system quality include user friendliness, availability, usability, ease of learning, and response time [12]. Prior research has found that learners' perception of system quality positively contributes to higher learner satisfaction with e-learning and higher learner use. Thus, it is plausible to assume that learners with higher satisfaction with e-learning and higher use may have more positive attitudes toward e-learning than those with lower satisfaction with e-learning and lower use. Hence, the following hypothesis is proposed:

H1: Perceived system quality will positively influence learners' attitude toward e-learning.

2.3 Perceived E-Learning Usefulness

Perceived usefulness is defined as “the degree to which a person believes that using a particular system would enhance his or her job performance” [13]. Perceived usefulness is deemed to be a main construct in the Technology Acceptance Model (TAM) and in the modified models of TAM. Perceived usefulness is considered to be a predictor of intention to use information technology [14]. In terms of e-learning system environment, perceived usefulness is believed to enhance students' attitude toward their course experience and would encourage online learners to take course in the future [15]. Empirically, Arbaugh found that perceived usefulness affected students' satisfaction [15]. Consequently, perceived usefulness has been widely accepted as a predictor for success of e-learning systems. Thus, the following hypothesis is posited:

H2: Perceived e-learning usefulness will positively influence learners' attitude toward e-learning.

2.4 Self-Management of Learning

Self-management of learning refers to “the extent to which an individual feels he or she is self-disciplined and can engage in autonomous learning” [16]. It is considered to be one of the key predictors of learning success and outcomes [17-19]. In short, better self-management of learning leads to better learning outcomes. In

addition, students with higher levels of self-regulated learning skills are likely to have better learning performance than those with lower levels of self-regulated learning skills [20]. Consequently, it is natural to surmise that students with higher self-management of learning will have more positive attitude toward e-learning than those with lower self-management of learning. Therefore, the following hypothesis is put forth:

H3: Self-management of learning will positively influence learners' attitude toward e-learning.

2.5 Self-Efficacy

Self-efficacy is defined as the degree to which an individual is confident that he or she can perform a specific task or achieve a specific goal [21]. Self-efficacy also refers to "beliefs in one's capabilities to organize and execute the course of action required to produce given attainments" [22]. Bandura also defined self-efficacy as "generative capability in which cognitive, social, and behavioral sub-skills must be organized into integrated courses of action to serve an innumerable purpose" [21].

We could thus define self-efficacy, in an e-learning context, as a learner's belief that his or her performance can be improved through achievement-related behavior [23]. Bandura suggested that self-efficacy correlates with achievement-related behaviors such as skills performance, motivation, and choice of activities [21]. Prior research found that a high degree of perceived self-efficacy is likely to incur improved learning performance and better behavioral retention in e-learning environments because learners have more positive attitudes toward learning environments [24-26]. Based on the above discussion, the following hypothesis is proposed:

H4: Self-efficacy will positively influence learners' attitude toward e-learning.

3. Method

3.1 Sample and Data Collection

Participating in the survey were a total of 236 college students who were taking introductory advertising courses (i.e., Foundations of Advertising, Advertising & Society) and did the survey in return for course credits. Of these 38.1% (n = 90) were juniors, 37.3%, (n = 88) were sophomores, 16.5%, (n = 39) were freshmen, and 8.1% (n = 19) were seniors. Their mean age was 23.2 years old. Among participants, males made up 33.5% (n = 79) while females made up 66.5% (n = 157).

An online survey was created to collect data from college students. The research team first sent online survey invitation e-mails to students. Second, only students who agreed to participate and provide consent were selected as participants. Third, they were then asked to click on the "Proceed" button to complete the survey. Survey participants were given a set of questions that concerned such realms as perceived system quality, perceived e-learning usefulness, self-management of learning, self-efficacy, and attitude toward e-learning (in order). Finally, students answered demographic questions concerning age, gender, and years in school.

3.2 Measure

The survey instrument items were developed based on modified existing scales from prior literature. The items used for this survey are explained in Table 1. All constructs were measured on a seven-point, Likert-type scale, from 1 = strongly disagree to 7 = strongly agree. The instrument items for perceived system quality, perceived e-learning usefulness, self-management of learning, self-efficacy, and attitude toward e-learning were adapted from prior studies [27-29]. In the current study Cronbach Alpha is used as an estimate of the reliability of the questions in each construct. Cronbach's Alpha is a reliability coefficient that indicates how well the items in a set are positively correlate to one another. The results of the reliability are also shown in (Table 1).

Table 1. Survey Instruments

Scale	Items
Perceived System Quality (Freeze, Alshare, Lane, & Wen, 2010; $\alpha=.81$)	The system is always available. The system is user friendly. The system provides interaction between users and the system. The system has attractive features that appeal to users. The system provides high-speed information access.
Perceived E-learning Usefulness (Liaw, 2008; $\alpha=.90$)	I believe e-learning contents are informative. I believe e-learning is a useful learning tool. I believe e-learning contents are useful.
Self-management of Learning (Richardson & Price, 2003; $\alpha=.86$)	When it comes to learning and studying, I am a self-directed person. In my studies, I am self-disciplined and find it easy to set aside reading and homework time. I am able to manage my study time effectively and easily complete assignments on time. In my studies, I set goals and have a high degree of initiative.
Self-efficacy (Liaw, 2008; $\alpha=.93$)	I feel confident using the e-learning systems. I feel confident operating e-learning functions. I feel confident using online learning contents.
Attitude toward E-learning (Liaw, Huang, & Chen, 2007; $\alpha=.84$)	I can learn actively in the e-learning environment. I can discuss actively with others in the e-learning environment. I can find information actively in the e-learning environment. I like the instructor's help and suggestions in the e-learning environment. I like the instructor's voice and image in the e-learning environment.

4. Results

Multivariate regression analysis was utilized to assess the impact of perceived system quality, perceived e-learning effectiveness, self-management of learning, and self-efficacy on attitude toward e-learning (Table 2).

Table 2. Results of Multiple Regressions

Variable	<i>R</i>	<i>R</i> ²	β	<i>t</i>	<i>p</i>
<i>Attitude toward E-Learning</i>					
Perceived System Quality	.586	.344	.101	1.56	.121
Perceived E-Learning Usefulness			.357	5.86	.000
Self-management of Learning			.198	3.34	.001
Self-efficacy			.134	2.15	.031

As a group, these variables significantly predicted subjects' attitude toward e-learning, $F(4,231) = 30.15$, $p < .001$, accounting for 34.4% of the variance. As shown in Table 2, the significant predictors were perceived e-learning effectiveness, self-management of learning, and self-efficacy. However, perceived system quality was not a significant predictor ($\beta = .101$, $p = .121$). Subjects scoring higher on perceived e-learning effectiveness, self-management of learning, and self-efficacy reported favorable attitude toward e-learning. As shown in Table 2, findings also show that regression coefficients are statistically significant for perceived e-learning ($\beta = .357$, $p = .000$), self-management of learning ($\beta = .198$, $p = .001$), and self-efficacy ($\beta = .134$, $p = .033$). Thus, H2, H3, and H4 were supported while H1 was rejected in this study.

(Table 3) shows the adjusted R square result to be 0.308, which means that this model explained 30.8% of the variation in dependent variable (attitude toward e-learning) by the three independent variables (perceived e-learning usefulness, self-management of learning, self-efficacy). The Durbin-Watson value (1.913) indicates independence of residual and there is no problem with serial correlation.

Table 3. Model Summary

	Construct	Adjusted R Square	Durbin-Watson
Model	Perceived e-Learning Usefulness Self-Management of Learning Self-Efficacy	.308	1.913

5. Discussion

In the current study, we included perceived system quality and perceived e-learning usefulness as a technology dimension; as a learner dimension, we included self-management of learning and self-efficacy. Study findings suggest that perceived system quality does not influence learners' attitude toward e-learning. Prior research suggests that learners' perceived system quality positively contributes to higher learner satisfaction with e-learning and higher learner use [11, 12]. However, this study does not support the significant relationship between perceived system quality and learners' attitude toward e-learning. Thus, more research is needed to examine this relationship in synchronous online learning contexts (happens in real time), as most prior research has been conducted in asynchronous online learning contexts (does not happen in real time).

This study found that perceived e-learning usefulness has a positive impact on learners' attitude toward e-learning. Previous studies have found that perceived usefulness is likely to enhance students' attitudes toward a course and encourage them to take another one in the future [14, 15]. Thus, it is important for instructors to remind their students how useful online courses are when it comes to acquiring knowledge and building relationships with instructors/peers.

Study results suggest that self-management of learning influences learners' attitude toward e-learning. This finding is consistent with prior research, which suggests that self-management of learning is a key predictor of learning success and outcomes [17-19]. In online learning contexts, students have more responsibility to achieve academic success and desirable performance than in face-to-face classroom contexts. Thus, instructors need to encourage e-learners to take charge of their own learning. Self-management of learning has proven to be important regardless of type of learning (online or face-to-face).

Lastly, this study posits that, based on prior research, perceived self-efficacy influences learners' attitude toward e-learning. This study also found perceived self-efficacy to have a positive impact on learners' attitude toward e-learning. This finding corroborates previous studies, which suggest that a high degree of perceived self-efficacy tends to incur improved learning performance and better behavioral retention in e-learning environments [24-26]. Thus, it is important for educators to provide students with opportunities to perform well in the classroom. In so doing, they can enhance students' sense of self-efficacy. This in turn can lead to a positive attitude toward e-learning as well as a high level of learning satisfaction.

In terms of future research, it would be interesting to investigate how technology such as VR content in online courses can increase students' satisfaction and contribute to the learning outcomes [30]. Effects of perceived usefulness on online learning can also be examined since perceived usefulness is deemed to be an important factor in online learning [31, 32].

Conflicts of Interest: The authors declare no conflict of interest.

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