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Assessing students' continuance intention in using multimedia online learning

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Abstract

The study aims to assess the students' continuance intention (SCI) in using multimedia online learning including students' perceived usefulness (SPU), students' ease of use (SPE), and students' flow experience (SFE). There is no, so far, assessment of students' activity in using multimedia online learning within the extended Technology Acceptance Model (TAM).There were 523 students as the samples. They learned and examined the content of online English learning resources as well as multimedia aspects.TAM was used to predict the SCI. The results indicate that the students' intentions are influenced positively by perceived usefulness, ease of use, and the flow experience. The SPU influenced more students' motivation than SPE. It is recommended that designers of online learning should be more specific in determining target users. The online learners' skill on ICT, pedagogical principles, and technological barrier in different region are among the determinant aspects for receiving positive enduring intention.

Keyword: multimedia online learning, students' continuance intention, TAM

1. Introduction

There are huge numbers of English lessons available on-line and are ready to be used by TEFL and ELT teachers for teaching Listening, Speaking, Reading, Writing, Pronunciation, and Grammar. Online learning is one of the new learning paradigms and it became the most prospective and prompt growth at the moment [1-4]. With its rapid growth, online leaning has yielded many competing multimedia learning template models such as Moodle, Edmodo, Blackboard system with the application of Wondershare, PPT Macros, Aurora 3D, Zondle, Hotpotato, iMindmap, Drop Box, Edmodo, ToolBook, Smashwords, Amazon Kindle DX, and PowToon.Multimedia learning can improve the performance and inteleginece of vocational school students [5].

Since the students are the end users of online learning system, the lesson designers need an attractive chanel to deliver the content of the lesson given by the mentor or the lecturer. The attention of the students on the lessons, for example, can be kept by providing menu and tools for communication channel, discussion forum, message boards, and chat rooms. In order to make it effective and useful for the learners, the contents of the lesson prescribed by the mentors or the lecturers should be interpreted by multimedia specialist in an attractive, economical, and communicative way. In doing so, multimedia does not only function as a means of communication but also increases students' learning motivation, attention and lead to the success of the students [6].

The degree to which a person believes that using a particular system would enhance student activity performance is called perceive usefulness [7]. Many studies had revealed that perceived usefulness as well as ease of use are critical factors in Information Technology (IT) or Information System (IS) adoption. Ease of use is defined as the degree to which a person believes that using a particular system would be free of effort. Perceived usefulness in the TAM model originally refers to job related productivity, performance, and effectiveness [7].

Other findings confirmed that there is also intrinsic motive called flow experience. Flow of experience is associated with positive subject experience and exploratory behavior [8]. This motive is the subject and determinant factor of users' intention in the context of electronic

services [9]. This state of flow often exists in different kinds of interaction involving in the context of online learning or Internet suffering experiences. Students' Percieved usefulness (SPU) significantly influences on users' acceptance and students' percieved ease of use (SPE) positvely influences percieved usefulness [10].

In addition, flow experience, characteristics, and experiences of individual students may also affect the behavior of multimedia online learning. Personal differences/individual differences are important factors in consumers' acceptance of new information technology products or services [11]. How beneficial the technology for increasing productivity and how easily it can be used, are directed to behavioural aspect of users [12, 13].

Since there has no assessment of students' activity in using multimedia online learning and proposed TAM [14], the modification and extrapolation of TAM by considering individual differences need to be done. This study tries to explain the students' continuance intentions in using multimedia online learning.

2.   Hypotheses and Research Model
2.1. Technology Acceptance Model (TAM)

Among a number of theoretical models employed in explaining individual's acceptance, adoption, and the use of Information Technology (IT) or Information System (IS), TAM is the most popular one because it can predict user's behavior or perceptions, and determine both its usefulness and ease of use as key factors [15]. All indicators of TAM such as SPU, SPE, SFE and SCI are valid to measure the user acceptance of technology [12].

TAM was derived or generated from Theory of Reasoned Action (TRA). According to TAM, the user adoption of IT/IS is influenced by his/her perceived usefulness and ease of use. Perceived usefulness is defined as the degree to which a person believes that using a particular system would enhance user activity performance while Perceived ease of use refers to the degree to which a person believes that using a particular system would be free of effort.

In conjunction with TAM effectiveness, an empirical study was carried out by some scholars to investigate the relationship between student behaviour, multimedia learning content and multimedia learning system [16-18]. Their findings suggest that an appropriate between characteristics of the student and multimedia technology result in greater enjoyment while the experience influence may moderate effects of the behaviour. Other empirical studies have confirmed that there are some other key factors in TAM model such as consumer's age, gender, and experience [12], [19].

SPU and SPE positively affect consumers' intention in using the Internet [20]. It is meant that an intuitive user interface can make his/her work easier and hence perform the job more efficiently. Many researches also have demonstrated that SPE will likely enhance SPU [15], [21]. Such relationship has further been supported by the extended TAM [7], [11], [21-23].In another study, SPU can predict behavioral intention [24]. There is a correlation between age and behavioral intention, perceived usefulness, and facilitated appropriation. Thus the following hypothesises were formulated:

Hypothesis 1 : Student perceived ease of use (SPE) has a positive effect on student continuance Intention (SCI).
Hypothesis 2 : Student perceived usefulness (SPU) has a positive effect on student continuance Intention (SCI).
Hypothesis 3 : Student perceived ease of use (SPE) has a positive effect on student perceive usefulness (SPU).

2.2. Flow Experience

A benchmark to determine an experience in accessing information systems is based on the concept of flow experience [25]. Flow experience is a representative of a person's perception and experience of the use of information systems. This will provide encouragement to someone who is involved in the system to limit him/her to any existing activities. Flow experience affected customer satisfaction and behavior of someone in the future [26].

In an online activity, internet users will gain different experience. This will have an impact that internet users should be in control of their own environment as well to get a good experience anyway [27]. In another study, it was explained that a sense of comfort and

concentration were the two most important factors in the flow experience [28]. In another research, it is found that the ease of flow experience was an important factor which was positive for the user's e-mail [8]. Flow experience and perception of convenience had a strong relationship [29]. Therefore, the researchers have the fourth hypothesis (H4) below;

Student perceived ease of use (SPE) has a positive effect on the student flow experience (SFE).

in another study, flow experience can be used to analyze and predict the sustainability and one's intention to carry out online activities [30]. Therefore, the researchers have the fifth hypothesis (H5) as follows;

Student flow experience (SFE) has a positive effect on student the continuance intention (SCI).

From the explanation above, the researchers synthesized the related construct and proposed the research model for explaining and predicting the student continuance intention towards multimedia online learning adoption shown in Figure1.
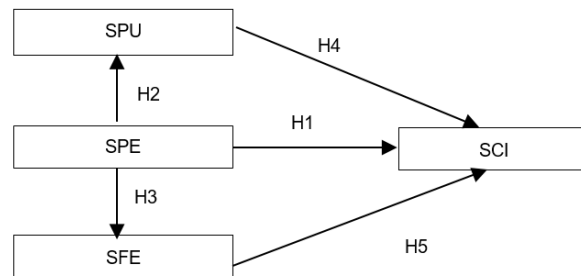

Figure 1. Hypotheses development and research model

3. Research Method
3.1. Instrument Design
Empirical data were collected through questionnaires. They were divided into two parts; personal information of the users and theoretical constructs of the proposed model. They were used to measure users' perception regarding the continued use of multimedia online learning. The questionnaires with seven-point Likert scales were distributed to 523 students from January 20, 2017 to April 15, 2017.
The item of constructs and sources consist of several aspects such as SCI with four items adapted from [31], SPE with also four items modified from [32, 33], and SFE with four items adopted from [30].

3.2. Sampling Method
Purposive sampling method, 523 online learning students, was applied. Respondents must have a qualification to participate in multimedia online learning as shown in Table 1.

Table 1. Demographics of the Respondents

Characteristics of the subjects		Number	%
Gender	Male	321	61.38
	Female	202	38.62
Age	Under 20 years	120	22.94
	20-25 years of age	300	57.36
	27-33 years old	103	19.69
Education	High school	120	22.94
	Under graduate students	300	57.36
	Graduate students	103	19.69
Experiences	6 Months	120	22.94
	1 Year	300	57.36
	More than 1 year	103	19.69

3.3. Data Analysis

To assess the indirect or mediating effects of four paths, the Sobel Test, Aroian Test and Goodman Test were used. Common method variance (CMV) was administered to identify unqualified responds of the questioners by referring to Harman's single-factor [34].

4. Results
4.1. Outer Model

The result of outer model is indicated by the relationship between indicators and latent construction. The existing construction is acceptable and reliable since its Cronbach α or reliability value was 0.7. Then the value of average variance extracted (AVE) is greater than 0.5; and the value composite reliability is also greater than 0.7. Table 2 below shows the details reliability and convergent values.

Table 2. Reliability Analysis and Convergent Validity

Construct	Measurement item	Factor loading/coefficient	Cranach's Alpha	AVE	Composite Reliability
SCI	SCI1	0.860	0.922	0.762	0.941
	SCI2	0.862			
	SCI3	0.932			
	SCI4	0.821			
	SCI5	0.887			
SFE	SFE1	0.862	0.917	0.750	0.938
	SFE2	0.854			
	SFE3	0.825			
	SFE4	0.904			
	SFE5	0.884			
SPE	SPE1	0.886	0.945	0.819	0.958
	SPE2	0.920			
	SPE3	0.913			
	SPE4	0.876			
	SPE5	0.930			
SPU	SPU1	0.863	0.915	0.746	0.936
	SPU2	0.848			
	SPU3	0.820			
	SPU4	0.903			
	SPU5	0.882			

4.3. Common Method Variance Testing

Common method variance (CMV) was administered to identify unqualified responds of the questioners by referring to Harman's single-factor [34]. CMV is confirmed when a single factor can explain most of the covariance of the variables. It is found that the factor failed to explain 50 per cent of the variance that existed, so it is meant that there was no CMV.

4.4. Inner Model

Inner construction model is the structure of the path among the paths. The t-value is used to crosscheck the significance of hypotheses. The results are exhibited in Table 3 and Figure 2. The symbol of **p-value means that corresponding value is lower than 0.01 or p<0.01.

Table 3. Summary of Hypotheses Testing Results

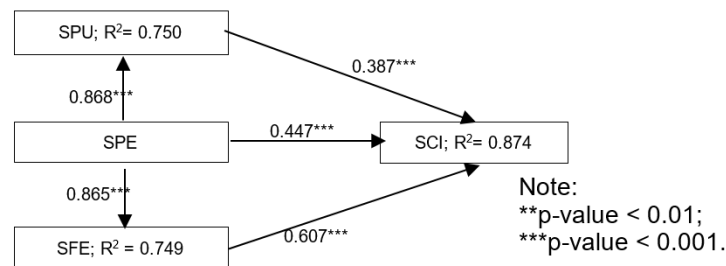| Hypothesis	Path	Standardized path coefficient	t-value	Supported
H1	SPE -> SCI	0.447***	4.520	Yes
H2	SPE -> SPU	0.868***	13.279	Yes
H3	SPE -> SFE	0.765***	11.398	Yes
H4	SPU -> SCI	0.509***	1.950	Yes
H5	SFE -> SCI	0.607***	1.971	Yes

Note: **p-value < 0.01; ***p-value < 0.001.

Figure 2. Inner model and path coefficient

4.5. Mediating Effects

Path analysis shows only the direct effects of the variables. To assess the indirect or mediating effects, four paths shown in Table 4 were tested using the Sobel Test, Aroian Test and Goodman Test. Test results in Table 4 were all significant, demonstrating that student flow experience (SFE) and student perceived usefulness (SPU) mediated the effects of other variables as expected.

Table 4. Mediation Effects of Testing

Constructs	Construct relationships	T-value of path coefficients	Sobel test's z-value	Aroian test	Goodman test
SPE-SPU-SCI	SPE -> SPU	13.279	1.929**	1.923**	1.934**
	SPU -> SCI	1.950			
SPE-SFE-SCI	SPE -> SFE	11.398	1.942**	1.934**	1.949**
	SFE -> SCI	1.937			

Note: **p-value < 0.05;

5. Discussion and Conclusion
5.1. Discussion

The results show that student perceived ease of use (SPE) significantly influence student continuance intention toward multimedia online learning (SCI). Perceived ease of use is an important factor in the early stages of a system's use [19]. The importance of ease of use can affect the student understanding the contents of the web. Consequently, students will increase their motivation to study.

Student perceived usefulness effects on continuance intention (SCI). This finding show that student perceived usefulness (SPU) directly affects SCI. It is in line with findings mentioned by [26] and [27] that SPU is more important than SPE in predicting the acceptance of new technologies. In order to enhance the usefulness of the multimedia online learning, it will be important that the provider of online learning have an accurate grasp of user needs and design the multimedia content accordingly.

Student perceived ease of use effects on perceived usefulness. This research has confirmed that student perceived ease of use (SPE) positively effects on student perceived usefulness (SPU) which was consistent with the findings of most studies of the extended TAM model. Student ease of use (SPE) also has a direct effect on student continuance intention (SCI) of multimedia online learning. This finding is consistent with previous study of hedonic information systems [35]. Thus, online learning providers are advised to design multimedia interface, contents and interaction that are very easy to use and follow, especially for the new students.

From the analysis, it can be inferred that student perceived ease of use (SPE) had a positive effect on student flow experience (SFE). In other words, a multimedia online learning that can be used easily had an impact on students in the control of their learning activities. It is a part of the flow experience that describes the relationship between human activity and the computer. It is a process in which someone explores information system in detail. This experience will have an impact on his/her satisfaction and feeling to conduct further exploration on the information system [36].

The importance of student perceived ease of use was discussed previously through its indirect effect via student perceived usefulness. It has a similar indirect effect via flow experience as discussed below.

The results show that the student flow experience (SFE) had a positive effect on continuance intention (SCI) of multimedia online English learning. In a previous study [7] suggested that the flow experience was the feeling that was generated from human-computer interaction. During this period students will learn and interact through online multimedia system, it will generate a new experience for students. Therefore, student flow experience has a direct impact on their behavior towards multimedia online English learning and also specifies the intention to continue using. In another study [30], it is identified that the flow experience had been an important predictor of the online system.

6. Conclusion

It is critical to understand factors that determine student continuance intention (SCI) in multimedia online learning. This study has found that positive student perceived usefulness (SPU), student ease of use (SPE) and student flow experience (SFE) all have positive effect on student continuance intention. The greater of those indicators correspond with, the higher their continuance intention. This research found positive effect on student perceived usefulness (SPU), and student perceived ease of use (SPE) on student flow experience (SFE). Significant results of student perceived usefulness and student flow experience were obtained in most relationships as expected. Significant results were found in all the relationships as expected. Since the researchers used an online questionnaire, there is some bias of the answers given by the students who did not often use the multimedia content as their online learning skills were not measured.

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