

Predicting SLA Students' Behavioral Intentions to Use Multimedia Web-Based English Learning Systems

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Abstract: In this study, a multimedia web-based English learning (MWBEL) system is implemented to assist undergraduate English learning as second language acquisition (SLA). The objectives of this study are to help the MWBEL system developers and university staffs to recognize what factors actually influence college student's intentions to use such a virtual learning environment. The research results indicate that students in SLA courses hold positive motivations towards the MWBEL system and exposed a possible benefit from its use in the long run. However, they also convey some negative opinions of the MWBEL system, suggesting additional improvement of the relative underlying factors of multimedia web-based English learning.

Keywords: Multimedia, second language acquisition, web-based English learning

Introduction

In today's Internet era, the prevalence of web-based applications makes learning and teaching through the Internet become the most popular way in education. Computer use and Internet access can provide a flexible option for information and knowledge acquisition and may further improve education quality. As the wide spread of web-based English learning courses continue to impact students around the world, it is critical to gain a better understanding of the influencing factors to improve student's language learning. Moreover, the integration of web-based technology with language learning has shifted the focus from teacher-centered classroom toward learner-centered environment which empowers the learner with the control over the lesson content and the learning process. Thus, this research was proposed to examine the underlying factors and causal relationships in predicting university second language acquisition (SLA) student's intentions to use a multimedia web-based English learning (MWBEL) system. The empirical results are expected to proffer instrumental suggestions to improve student's English learning performance via multimedia web-based learning.

1. Literature review

1.1 Multimedia Web-Based English Learning (MWBEL)

A multimedia web-based English learning (MWBEL) environment integrates the use of multimedia with web-based technologies and has become a new trend for English teaching

and learning in Taiwan. From an integrative view, the Internet can not only integrate image, sound, graphics and text to help students understand the course subjects, but also to integrate the four language skills together in one piece of language learning courseware. Student's perceptions, belief, and attitudes regarding computer-assisted and multimedia web-based language learning have been the concern of many studies (e.g., [1]). Since learning is part of social activities and learning process can be highly influenced by social interactions with others, learning activities enable students not only to cooperate with each other but also to enhance learning efficiency through active interaction with others [5]. Understanding how to effectively improve the interactivity is crucial for system designers and instructors to realize why or why not a web-based learning system can be successful.

1.2 Theoretical Development

Drawing on the concepts from technology acceptance model (TAM) and social cognition theory (SCT), this study proposed a research model and developed an instrument for measuring student's intentions to use this system. As Figure 1 shown in section 4, the model hypothesizes that perceived enjoyment (PE) and system characteristics (SC) are underlying determinants of the perceived usefulness (PU) and perceived ease of use (PEOU) of the MWBEL system; negative affect (NA) and social influence (SI) are underlying determinants of self-efficacy (SE), while the constructs, in turn, influence behavioral intentions to use the technology. Because TAM is used as the baseline model of this study, the hypothesized relationships in TAM will be verified. Therefore, we proposed:

- *H1: Perceived Usefulness (PU) has a direct effect on Behavioral Intentions (BI) to use the MWBEL system.*
- *H2a: Perceived Ease of Use (PEOU) has a direct effect on Behavioral Intentions (BI) to use the MWBEL system.*
- *H2b: Perceived Ease of Use (PEOU) has a direct effect on Perceived Usefulness (PU).*

Venkatesh [12] argued that users who perceive training experience to be enjoyable are more likely to perceive the system to be easier to use and the perceived ease of use has positive effect on behavioral intentions to use the system. Other researchers extended the technology acceptance model by incorporating motivation variables in order to predict the use of web-based information system and the results indicated that enjoyment has significant effect on usefulness and ease of use. Thus, we proposed:

- *H3a: Perceived Enjoyment (PE) has a direct effect on Perceived Usefulness (PU).*
- *H3b: Perceived Enjoyment (PE) has a direct effect on Perceived Ease of Use (PEOU).*

In TAM related research, system characteristics have been examined to be external variables towards users' acceptance of information technology through the mediation of perceived usefulness and perceived ease of use. Davis [3] suggested that system characteristics can be fully mediated by TAM model on usage behavior. Igbaria et al. [7] also confirmed in their study the effects of system characteristics on perceived usefulness and ease of use. Hence, the following hypotheses are proposed:

- *H4a: System Characteristics (SC) have direct effect on Perceived usefulness (PU).*
- *H4b: System Characteristics (SC) have direct effect on Perceived Ease of Use (PEOU).*

Taylor and Todd [11] suggested that self-efficacy has significant indirect influences on behavioral intentions. Compeau et al. [2] developed a model to test the influence of computer self-efficacy on computer usage and the finding showed that self-efficacy has significant positive influence on use. Ma and Liu [8] found that Internet self-efficacy has a significant impact on behavioral intentions to use web-based electronic medical records. Based on the previous studies, the following hypotheses are proposed:

- *H5: Self-Efficacy (SE) has a direct effect on Behavioral Intentions (BI) to use.*

According to TRA, the direct effect of social influence to behavior intentions is attributed to individual's belief about one or more important referents would think he/she should perform certain behavior even though the behavior is not favorable. Moreover, within the concept of SCT, self-efficacy is based on the reciprocal relationship between cognitive and behavioral concept which can be influenced by environmental factors, such as social pressure and peer influence. Therefore, the following hypotheses are proposed:

- *H6a: Social Influence (SI) has a direct effect on Behavioral Intentions (BI).*
- *H6b: Social Influence (SI) has a direct effect on Self-Efficacy (SE).*

Pare and Elam [9] conducted a study regarding the adoption of personal computer and concluded that anxiety has a negative effect for user to utilize system software. Compeau et al. [2] tested the influence of anxiety on computer usage and the result showed that there is no significant influence exists. However, in a web-based language learning environment supported by multimedia language instruction system, students can benefit from the non-threatening environment to support their learning [10]. Thus, we proposed:

- *H7: Negative Affect (NA) has a direct effect on Self-Efficacy (SE).*

2. Methodology

2.1 Research Design and Instrument Development

A cross-sectional field survey was conducted with data collected from a technical-vocational college. Those for perceived usefulness, perceived ease of use, and behavioral intentions to use were adapted in our model from previous studies on TAM. The construct of system characteristics was derived from the study of Davis et al. [4]. The scales for self-efficacy were based on the prior work of Compeau et al. [2]. The construct of social influence was adapted from Taylor and Todd [11]. The measures for perceived enjoyment were captured using three items from prior related research, and other constructs were derived from the actual teaching experience of researchers. An iterative personal interview process was conducted to refine the initial questionnaire items.

2.2 Participants

This study was conducted in a well-known technology college located in the southern part of Taiwan. The subjects for this study were students who have the experience to use the MWBEL system. Students who enrolled in an SLA course were coded and randomly selected from the administration affairs system of this vocational-technical college. For each question, the respondents were asked to circle the response which best described their level of agreement. Finally, a total of 258 out of the 283 questionnaires distributed were collected, giving response rate of 91 percent. Fifty-five participants gave incomplete answers and their results were dropped from the study. This left 218 sets of data for statistical analysis, a 77 % valid return rate.

3. Data analysis and results

3.1 Measurement assessment

To ensure the phenomena captured, in this study, representing the constructs of the conceptual framework, the validity and reliability of the instrument were assessed by PLS method. All items have significant factor loadings above the threshold value, 0.707 [6]. All constructs in the model exhibit good internal consistency as evidenced by their composite reliability scores (Table 1). The composite reliability coefficients of all constructs in the

proposed conceptual framework (Figure 1) are more than adequate, ranging from 0.89 for the construct of social influence to 0.96 for behavioral intentions to use the MWBEL system. To show discriminant validity, each construct square root of the AVE has to be larger than its correlation with other factors. All constructs meet this requirement. Finally, the values for reliability are all above the suggested minimum of 0.7 [6]. Thus, all constructs display adequate reliability and discriminant validity (Table 2). All constructs share more variance with their indicators than with other constructs. Thus, the convergent and discriminant validity of all constructs in the proposed conceptual framework can be firmly assured.

Table 1. Factor analysis

Construct	Item	Loading	Construct	Item	Loading
Perceived enjoyment	PE1-3	0.94-0.95	Perceived usefulness	PU1-5	0.84-0.89
System characteristics	SC1-6	0.84-0.87	Perceived ease of use	PEOU1-5	0.80-0.87
Social influence	SN1-4	0.82-0.87	Self-efficacy	SE1-4	0.88-0.90
Negative affect	NA1-4	0.81-0.84	Behavioral intentions	BII-3	0.92-0.96

Table 2. Inter-correlation among constructs

Construct	Construct								Composite Reliability
	PU	PEOU	SC	SE	NA	PE	SN	BI	
PU	0.87*								0.94
PEOU	0.56	0.85							0.93
SC	0.63	0.64	0.87						0.94
SE	0.53	0.75	0.63	0.89					0.94
NA	-0.20	-0.23	-0.24	-0.28	0.86				0.92
PE	0.68	0.56	0.65	0.63	-0.26	0.95			0.96
SI	0.50	0.64	0.60	0.62	-0.21	0.54	0.85		0.89
BI	0.65	0.62	0.67	0.64	-0.27	0.80	0.54	0.94	0.96

*Diagonal elements are the square roots of AVE.

3.2 Test of the Structural Model

The path coefficients and explained variances for the proposed model in this study are shown in Figure 1. Perceived usefulness, perceived ease of use, self-efficacy, and social influence account for 56% of the variance explained in behavioral intentions to use the MWBEL system. Perceived enjoyment, system characteristics, and perceived ease of use together explain 55% of the variance in perceived usefulness, while perceived enjoyment and system characteristics explain 45% of the variance in perceived ease of use. The construct of self-efficacy was contributed by Social influence and negative affect with the explained variance of 44%. Therefore, overall, the model has strong explanatory power for the construct of “behavioral intentions to use the MWBEL system”.

4. Discussions and Conclusion

Over the past few decades, the importance of web-based instruction to SLA education in English has increased significantly in Taiwan. The research findings suggested general adequacy and applicability of the proposed conceptual framework in the multimedia web-based English learning settings. In addition, this study employed a rigorous scale development procedure to establish an instrument to weigh up student’s behavioral intentions to use the multimedia web-based language learning system. Web-based learning program directors, system developers and instructors can make the best of this MWBEL system instrument for understanding of student’s inclinations and take necessary corrective actions to improve. Besides making an overall assessment, the instrument can be adapted to compare student’s perceptions and intentions for different web-based learning systems with specific factors (i.e. learner interface, learning community, content, and personalization).

The research model might also be tailored to counterpart the specific research or practical needs of specific computer aided instruction (CAI) environment. The generality of the results can also serve as a useful refereed basis for the comparative analyses in the future.

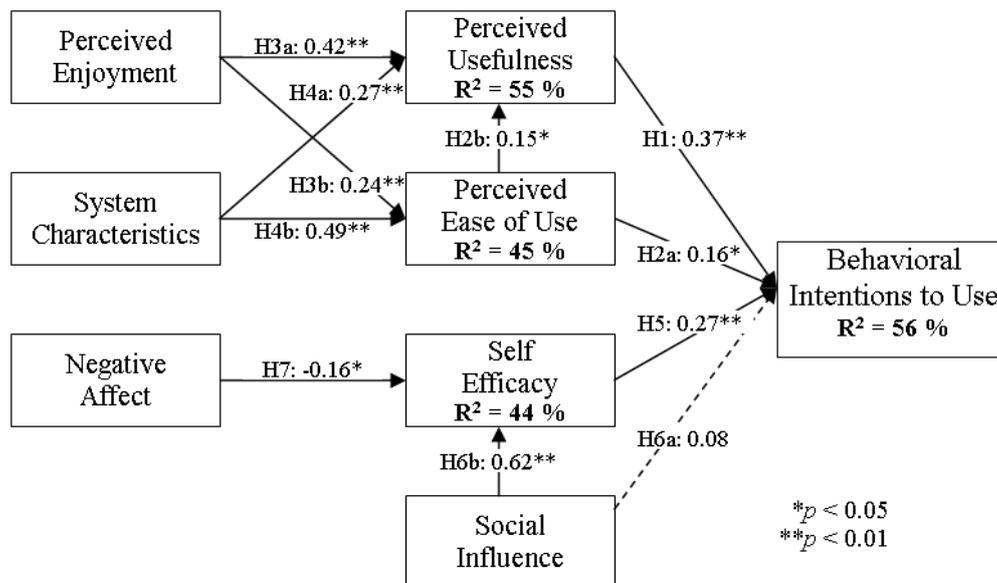


Figure 1: Research model and PLS analysis results

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