A Study on the User Satisfaction of Interactive Multimedia Learning, A Case Study of American English

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Abstract — The teaching model of interactive multimedia learning is only implemented by a few schools in Taiwan. The learning cognition and outcomes of such model have not yet been studied and discussed deeply, so this study conducted in-depth exploration and research on the user satisfaction of teaching model of interactive multimedia learning to further probe into the correlation among subjective norm, self-efficacy, system quality, technology acceptance model, and user satisfaction.

Keywords — technology acceptance model, subjective norm, self-efficacy, system quality, user satisfaction

I. INTRODUCTION

Knowledge learning began from the earliest one-way knowledge dissemination from a teacher to a student. However, the rapid development of information technology and network communications has dramatically changed the learning environment of education. Higher education, as time goes by, changes a lot, wherein, learning paradigm shift was the most prominent (Rovai and Jordan, 2004). Barr and Tagg (1995) described it as a shift from teaching-centered to learning-centered model, leading the traditional teaching model to a new level (Gardiner, 1998). Under such context, a teaching model of interactive multimedia learning has recently sprung up in the education circle.

The status quo of American English learning in Taiwan is described as an "all-people movement". The various reasons include: Fist, as of TOEFL, officially certified, the ranking of Taiwan globally is not satisfying. In addition, after many years' study of American English, most people still cannot perform basic oral communication with British and American. In order to enhance Taiwan's internationalization, the Government considers "enhancing Taiwanese language ability to integrate with the world and pursue internationalization" as one of its main policies, making American English learning an all-people movement in Taiwan (Chang, 2010).

However, the teaching model of interactive multimedia learning is only implemented by a few schools in Taiwan. The learning cognition and outcomes of such model have not yet been studied and discussed deeply, so this study conducted in-depth exploration and research on the user satisfaction of teaching model of interactive multimedia learning to further probe into the correlation among subjective norm, self-efficacy, system quality, technology acceptance model, and user satisfaction.
subjective norm referred to the perceived views of important reference groups for an individual, which influenced his/her decision-making (Han et al., 2010).

Self-efficacy was the belief of an individual to assess his/her success or the subjective assessment of whether he/she could complete a task (Bandura, 1982). Compeau and Higgins (1995) mentioned in their study that "self-competence" referred to the organization and execution abilities of an individual required to achieve a specific task, which had nothing to do with his/her skills, but his/her ability to take advantage of his/her abilities and make decisions (Bandura, 1986), or, his/her ability to complete the task.

System quality, according to DeLone and McLean (1992), referred to the overall performance of a system and the assessment of personal views. DeLone and McLean (2003) thought that system quality was the process to assess and process the system, while Sakaguchi and Frolick (1997) believed that system quality meant that information system could integrate different information data to meet user demands with system integrating function, so system quality would affect user satisfaction (Kuo, 2010).

Technology Acceptance Model (TAM) was developed by Davis (1989) based on Theory of Reasoned Action (TRA). TAM mainly introduced two cognition beliefs, namely, Perceived Usefulness (PU) and Perceived Ease of Use (PEOU), as the influencing points of technology analysis, which are respectively described below: (1) PU: It refers to the usefulness on the enhancement of work performance believed by a user who adopts an information system. That is to say, when the user thinks that the system will enhance his/her work performance, he/she will have a positive attitude towards the information system. (2).PEOU: It refers to the free of effort degree perceived by a user who uses an information system. In other words, when a user believes an information system is easier, he/she has a more positive attitude towards the idea that he/she does not need to spend extra time and energy in learning. Many recent studies have conducted case study on E-learning with TAM, such as Robert, et al., (2007), Erkki (2008), Sun (2008), Li (2008), and Lin (2010).

Karahanna et al. (1999) pointed out that subjective norm was "the expectation of an individual about the use or continuous use of this IT by others". Such a social influence had two types. One was informational influence, which occurred after an individual accepted information and considered it as a part of fact. The other was normative influence, which occurred when an individual complied with the expectations of others (Chen, 2003). In other words, subjective norm was an important reference indicator to agree whether to perform an act or not. Bandura defined self-efficacy as a belief of an individual to achieve success. The formation of this belief was based on the subjective assessment of whether he/she had the ability to complete a certain task or behavior (Bandura, 1977, 1982). According to the above literature, this study proposed the following hypotheses:

H1: Subjective norm had a significant positive influence on PU.
H2: Self-efficacy had a significant positive influence on PU.
H3: System quality had a significant positive influence on PU.
H4: Subjective norm had a significant positive influence on PEOU.
H5: Self-efficacy had a significant positive influence on PEOU.
H6: System quality had a significant positive influence on PEOU.
H7: Subjective norm had a significant positive influence on satisfaction of intension to use.
H8: Self-efficacy had a significant positive influence on satisfaction of intension to use.
H9: System quality had a significant positive influence on satisfaction of intension to use.

Since e-learning is different from traditional classroom learning, learner satisfaction is of great importance. It could be used to measure and predict the possibilities and opportunities of learners to take part in similar learning ways in the future (Piccoli et al, 2001). Cyert and March (1963) noted that the usage requirements of information systems would increase user satisfaction if their needs were satisfied; Otherwise, decrease. Li Weide (2008) pointed out that user satisfaction was a subjective feeling, mainly referring to the subjective feelings of a user on an information system rather than the quality of the information system technology. User satisfaction was assessed by comparing the user's expectation before purchase and his/her actual feelings after purchase. Actual cases were studied to understand the influence of satisfaction on repurchase intention. According to the literature, this study proposed the following hypotheses:
C. Satisfaction of intention to use

According to Kotler’s (2003) definition, satisfaction referred to the reaction of a user on the characteristics of system functions. And user satisfaction referred to “the degree of compliance of an information system with a user's of needs, including the sum of the user's assessment reactions to the information system, feelings, and attitudes factors (Yun, 2008). As of the study on personal characteristics, if a learner had previous experience of e-learning, he/she could develop a better learning strategy to match with the learning environment. The more previous experiences the user had, the more positive attitude, less anxiety, and higher learning satisfaction held by the user towards the learning with information technology as a medium (Arbaugh, 2002; Piccoli et al., 2001.). In terms of attitude, Hannafin and Cole (1983) found that the attitude towards the adoption of a computer would have an influence on learning interest. Positive attitude towards the adoption of a computer would increase the chances of success of e-learning, while negative attitude would do the opposite. According to the literature, this study proposed the following hypotheses:

H10: PU had a significant positive influence on user satisfaction.

H11: PEOU had a significant positive influence on user satisfaction.

III. RESEARCH METHOD

A. Research Structure

![Diagram of research structure]

C. Measure

The questionnaire of this study was measured with Likert Five-point Scale from 1 (strongly disagree) to 5 (strongly agree). As of the scale, the questionnaires of subjective norm developed by Venkatesh et al. (2003) and of self-efficacy developed by Taylor and Todd (1995) were adopted. The scale developed by Delone and Mclean (2003) was used to assess system quality. For PU and PEOU, the questionnaire on PEOU developed by Davis (1989) was used. As of satisfaction of intention to use, the questionnaire on behavioral intention developed by Venkatesh et al. (2003) was employed.

IV. EMPIRICAL RESULTS AND ANALYSIS

A. Overall Correlation Analysis

According to Wu (2009), r value above 0.800 means high positive correlation, while r value between 0.401 and 0.799 means moderate positive correlation, and r value below 0.401, low positive correlation. It shows that "subjective norm" had a moderate positive correlation with "self-efficacy, system quality, PU, and satisfaction of intention to use" (r = 0.475, p < 0.01; r = 0.502, p < 0.01, r = 0.477, p < 0.01; r = 0.474, p < 0.01). "Subjective norm" and "PEOU" had a low positive correlation (r = 0.373, p < 0.01; r = 0.559, p < 0.01). "User satisfaction" and "self-efficacy, system quality, PU, and PEOU" had a moderate positive correlation (r = 0.557, p < 0.01; r = 0.719, p < 0.01; r = 0.733, p < 0.01; r = 0.645, p < 0.01) with a significant level. It reveals that when "satisfaction of intention to use" and "self-efficacy, system quality, PU, and PEOU" had a moderate positive correlation, higher score of user satisfaction means higher scores of self-efficacy, quality system, PU, and PEOU.

This study examined collinearity before multiple stepwise regression analysis. Provided the tolerance value was greater than 0.1, VIF was less than 10, and CI was less than 30, collinearity did not exist (Chen and Wang, 2011). After tested by this study, the tolerance value of the three variables was between 0.576 and 0.680, VIF between 1.747 and 1.471, and CI between 12.120 and 19.759. The results were in compliance with the above conditions, implying no collinearity. Hence, regression analysis could be conducted (table 1).

### TABLE I. SUMMARY OF RELEVANT ANALYSIS ON VOLUME DIFFERENCE

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<tbody>
<tr>
<td>1. Subjective norm</td>
<td>1</td>
<td>0.475**</td>
<td>0.502**</td>
<td>0.373**</td>
<td>0.474**</td>
</tr>
<tr>
<td>2. Self-efficacy</td>
<td>0.475**</td>
<td>1</td>
<td>0.616**</td>
<td>0.678**</td>
<td>0.557**</td>
</tr>
<tr>
<td>3. System quality</td>
<td>0.502**</td>
<td>0.616**</td>
<td>1</td>
<td>0.641**</td>
<td>0.719**</td>
</tr>
<tr>
<td>4. PU</td>
<td>0.373**</td>
<td>0.678**</td>
<td>0.641**</td>
<td>1</td>
<td>0.733**</td>
</tr>
<tr>
<td>5. PEOU</td>
<td>0.474**</td>
<td>0.657**</td>
<td>0.719**</td>
<td>0.645**</td>
<td>1</td>
</tr>
<tr>
<td>6. Satisfaction of intention to use</td>
<td>**p &lt; 0.05, **p &lt; 0.01, ***p &lt; 0.005</td>
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DOI 10.5013/IJSSST.a.17.44.01 1.3 ISSN: 1473-804x online, 1473-8031 print
### B. The Prediction Relationship among Subjective Norm, Self-efficacy, System Quality, PU, PEOU, and satisfaction of intention to use

1) Regression analysis of PU, PEOU, and satisfaction of intention to use

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<tr>
<th>TABLE II. MULTIPLE STEPWISE REGRESSION ANALYSIS OF PU and PEOU VS. &quot;SATISFACTION OF INTENSION TO USE&quot;</th>
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<td>Level</td>
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<tr>
<td>PU</td>
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<td>PEOU</td>
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Note: * p < 0.05, **p < 0.01, *** p < 0.005

Table 2 shows that, as of PU and PEOU, PU (β = 0.556) and PEOU (β = 0.251) can significantly predict "satisfaction of intention to use" (F = 191.621, p < 0.01). The multiple correlation coefficient between PU and PEOU is 0.754, while the total predictive power is 0.566, which can explain 56.6% of variation of "satisfaction of intention to use".

2) Regression analysis of subjective norm, self-efficacy, system quality, and PU

This study regarded "subjective norm, self-efficacy, and system quality" as predictors, and "PU" as a dependent variable, which were verified by multiple stepwise regression analysis. See Table 3 for results.

<table>
<thead>
<tr>
<th>TABLE III. MULTIPLE STEPWISE REGRESSION ANALYSIS OF SUBJECTIVE NORM, SELF-EFFICACY AND SYSTEM QUALITY VS. &quot;PU&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level</td>
</tr>
<tr>
<td>Subjective Norm</td>
</tr>
<tr>
<td>Self-efficacy</td>
</tr>
<tr>
<td>System Quality</td>
</tr>
</tbody>
</table>

Note: * p < 0.05, **p < 0.01, *** p < 0.005

Table 3 shows that, "subjective norm" (β = 0.099), "self-efficacy" (β = 0.291), and "system quality" (β = 0.480) can significantly predict "PU" (F = 122.869, p < 0.005). The multiple correlation coefficient among "subjective norm", "self-efficacy", and "system quality" is 0.749, while the total predictive power is 0.557, which can explain 55.7% of variation.

3) Regression analysis of subjective norm, self-efficacy, system quality, and PU

This study regarded "subjective norm, self-efficacy, and system quality" as predictors, and "PEOU" as a dependent variable, which were verified by multiple stepwise regression analysis. See Table 4 for results.

### V. CONCLUSION AND SUGGESTIONS

#### A. Conclusion and Suggestions

Subjective norm, self-efficacy, system quality, PU, PEOU, and satisfaction of intention to use show a moderate positive correlation. Besides, the results of this study imply that in the three aspects of subjective norm, self-efficacy, and system quality, only self-efficacy and "subjective norm" have a significant impact on satisfaction of intention to use. This study implies that the development of interactive multimedia systems should not only focus on the satisfaction of the users, but also consider the individual's subjective norms, self-efficacy, and system quality to enhance user satisfaction.
system quality can predict PEOU significantly. Subjective norm, self-efficacy, and system quality can all significantly predict PU. Subjective norm, self-efficacy, and system quality can all significantly predict satisfaction of intention to use, wherein, "system quality" is more influential. Besides, PU and PEOU of technology model can significantly predict "satisfaction of intention to use", wherein, "PU" is more influential. Therefore, if it wants to improve PU, system quality of products, and satisfaction of intention to use, Ynso American English Institute shall strengthen system quality of products and self-efficacy of users and PU of consumers.

B. Managerial Implication

The preferred spelling of the word “acknowledgment” in America is without an “e” after the “g.” Avoid the stilted expression “one of us (R. B. G.) thanks ...”. Instead, try “R. B. G. thanks...”. Put sponsor acknowledgments in the unnumbered footnote on the first page.

For teachers of extra tutoring, it is undoubtedly a primary work to understand and grasp the intentions of consumers. Important factors influencing satisfaction of intention to use include: subjective norm, self-efficacy, system quality, PU, and PEOU. And subjective norm, self-efficacy, and system quality have a positive influence on PU and PEOU. Thus it can be seen that, in order to make Ynso interactive multimedia system acceptable and satisfying for consumers, the fundamental requirements are PU and PEOU. Therefore, in order to make consumers feel the usefulness and usability, firstly we need to make them aware that the system is easy to understand and use with good quality. A user can operate it independently and complete interactive multimedia learning. Besides, using the interactive multimedia study will be influenced by others, so more people will use it. Equipped with these factors, consumers might feel that it’s helpful to use the interactive multimedia in learning. And all these factors shall be considered by Ynso as of designing and planning.

Consumers (students) are the most important assets of extra tutoring industry. How to develop and retain consumers has always been a major issue of the industry. Hence, in terms of marketing strategy, it is suggested that word-of-mouth marketing can be adopted to expand consumer groups and attract more consumers. Apart from that, in order to make consumers feel that they can accomplish the tasks by themselves, while their confidence can be improved by interactive multimedia learning, we must have good system quality. However, besides the technical problems of the system platform, the most important is that we shall focus on the service uniqueness and quality of Ynso. Only in this way can we sell our products by word-of-mouth marketing. Therefore, this study finds out that in order to achieve word-of-mouth marketing and satisfaction of intention to use, we shall strengthen both hardware and service quality.

REFERENCES


