Applying the UTAUT to Understand Factors Affecting the Use of English E-Learning Websites in Taiwan

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Abstract
The evolution of the Internet diminishes learning’s limits on time and location and attracts more and more students to learning websites or online learning environments to pursue their chosen studies. The purpose of this study is to explore Taiwanese college students’ needs for English E-learning websites. Accordingly, this paper uses the unified theory of acceptance and use of technology to investigate and explain Taiwanese college students’ acceptance of English E-learning websites. After analysis, the results demonstrate that performance expectations, effort expectancy, and social influence have positive effects on behavior intentions and facilitating conditions; behavioral intentions also have positive effects on use behavior. Overall, if students believe that English E-learning websites can help them increase their performance and that they are easy to use, there is an increase in their intention to use them. This suggests that web designers should improve knowledge management functions and improve user interfaces to be easier to operate.

Keywords
E-learning, unified theory of acceptance and use of technology (UTAUT), technology acceptance model (TAM), model combining the technology acceptance model and theory of planned behavior (C-TAM-TPB), motivational model (MM), English E-learning behavior

Introduction
With the advent of the Internet, students not only can go to school to listen to live lectures but are also able to develop skills through Internet platforms. In other words, learning via the Internet can enhance studying efficiency. Everyone has access to knowledge more than ever before through the Internet. In addition, E-learning is accessible from any location. The Internet, computers, satellite broadcasting, audio and videotapes, interactive television and CDs are all examples of multimedia. Moreover, we can learn about a wide range of topics through the Internet and are not limited by physical constraints, such as the need to cram schools and classrooms with students, and so on.

Tsai (2009) has developed courseware for semiconductor technology that overcomes problems encountered in developing English Special Programs (ESP) in Taiwan. In the design of the courseware, five skills for learning English (listening, speaking, reading, writing, and translation) have been considered and a 3D multimedia technique has been used to promote learning interest, student engagement, and efficiency. Students report they have benefited from the courseware implementation. They report that the multimedia-assisted environment promotes learning effectiveness (Sihar, Hj Ab Aziz, & Sulaiman, 2011).

Taiwan has an extremely competitive infrastructure for information and communication technology. West (2005) ranked it 1st in e-government, while Waseda University ranked it 7th (Waseda University of e-Government, 2006). In terms of promoting digital business and Information and Communication Technology (ICT) services, the Economist Intelligence Unit (2009) ranked Taiwan 16th (Tao, 2008).

The Internet and computers are becoming a part of daily life for Taiwanese college students. E-learning supplies high-speed access to knowledge and information. According to a study by the Bank of Taiwan, 67.4% of people are willing to use E-learning, rather than going to school or reading books, to complete learning activities; the convenience of the Internet is most attractive to them. However, only 40.4% of people have had E-learning experience. Thus, we can conclude the Internet is very common in Taiwan and has many benefits. We still have many obstacles to overcome in increasing the rate of E-learning usage. Therefore, the goal

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of this study is to understand the decisions affecting choices of English E-learning websites. The research results may be utilized in future English E-learning website service development suggestions, and to improve usability and adaptability. Although this research is based on Taiwanese college students, the results should be relevant to other language learners.

We attempted to explore Taiwanese college students’ intentions to use English E-learning websites. The unified theory of acceptance and use of technology (UTAUT) model was used to assess the technological and value issues and thus obtain an understanding of Taiwanese college students’ decisions to use English E-learning website services.

Based on these facts, this study aims to focus on three objectives:

- To identify the influence of the UTAUT factors on the adoption of English E-learning websites.
- To understand college students’ needs for English E-learning websites in Taiwan.
- To understand the influence of online English E-learning on students’ behavior in Taiwan.

Literature review

E-Learning

E-learning is changing the way education is implemented and perceived. Schools can take advantage of this technology to make learning faster, cheaper, and more effective. These types of improvements are especially appealing to corporations. Corporate executives have begun to recognize that high-quality training creates long-term competitive advantages. They increasingly realize that effective education’s strategic benefits can outweigh its costs. (Hambrecht and Co, 2001)

With the rapid growth of e-learning, a technological revolution is currently taking place in institutions of higher learning (Sihar et al., 2011). E-learning is a learner-centered educational system that enables learners to learn whenever, wherever, and whatever they wish, according to their learning objectives (Rosenberg, 2001).

The organizational structure of learning should be consistent with knowledge management practices in schools. In addition to social interaction among teachers, it is necessary to facilitate resource management (e.g., time and space sharing) that contributes to teaching and learning because it provides an environment where knowledge management practices take place. For example, schools need to consider what types of IT resources are important to develop physical and online environments for sharing and whether teachers are able to use them effectively (Leung, 2010).

As research observes, however, the use of technology has positive performance effects when learning foreign languages and also improves students’ motivation.

Definition of E-learning. E-learning is also called computer-assisted instruction, Web-based learning, distributed learning, online learning, or Internet-based learning. There are two E-learning modes. The first is computer-assisted instruction, which uses computers to aid in the delivery of stand-alone multimedia packages for teaching and learning. The second mode is distance learning, which uses information technologies to deliver instruction to remote learners from a central site.

A traditional approach is a face-to-face approach, which is similar to Osborn’s definition. An electronic approach may incorporate teleconferencing, chat rooms, or discussion boards. Instant messaging is a most common communication channel on the web, through such famous services like Microsoft MSN, Yahoo Messenger and Skype (Lin, 2009).

E-learning is becoming a major component in academia today. There is a need for formalized guidelines in E-Learning that instruct the designer (course instructor) on how to design, maintain, and manage a course. There are a wide variety of E-learning systems available on the market. Content available web learning is variable: some of it is excellent, but much is mediocre. The needs of content developers, educators, and students cannot be addressed through many available E-learning services; there are gaps that need to be addressed (Jayanthi, Srivatsa, & Ramesh, 2007).

Benefit of E-learning. Communication technologies such as the Internet are creating abundant opportunities to facilitate learning (Wang, 2008). One drawback may be that learners must be more responsible for themselves in E-learning environments. However, this also provides more opportunities for learners to choose their own directions and set their own pace. Systems can also provide materials that are fine-tuned to users’ needs.

As .NET framework-specific distributed technology, .NET remoting is not designed to provide interoperability or crossing trust boundaries to third-party clients. On the other hand, .NET remoting provides faster communication speed over internal networks. (Amirian & Alesheikh, 2008).

Chen and Tsai (2011) conducted a study regarding Virtual Classroom development, providing several strategies for building up prospective e-classroom districts or schools.

In December 2009, another study evaluated three E-learning systems in Iran that have been used in well-known universities: the Iran University of Science and Technology (IUST), the AmirKabir University of Technology (AUT), and the Virtual University of Shiraz (SVU), all of which are located in Tehran. All of these universities provided high-quality E-learning systems for students and have collected some information regarding the systems’ performance through interviews with students and staff (Etaati, SadiNezhad, & Makue, 2011).

Empirical studies have applied media psychology to examine esthetic-emotion items, treated as adjectives associated with the two motivational models (MMs) developed by...
Tan Keller, Malone, and Lepper, which are suited for formal and informal visual environments, respectively. Exploratory factor analysis (EFA) has been performed on aesthetic-emotion items in two studies to develop a scale to measure learners’ motivation (Riaz, Rambli, Salleh, & Mushtaq, 2011). Furthermore, the expanding multimedia capabilities of new technologies provide vast opportunities to engage and motivate learners.

Table 1 shows the comparisons between traditional classroom learning and E-learning.

### Table 1. Comparisons Between Traditional Classroom Learning and E-Learning.

| Characteristic          | Classroom                          | E-learning                        |
|-------------------------|------------------------------------|-----------------------------------|
| Time and place limits   | Time and location dependent        | Anytime-anywhere                  |
|                         | Physical—limited scale             | Unlimited                         |
| Teaching content        | Teacher-centered                    | Student-centered                   |
| Personalization         | Push approach                       | Pull approach                      |
|                         | One learning path—lowest common denominator | Learning pace and path determined by user |
| Learning style          | Rigid                               | Flexible                           |

Source. Studies.

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### Adoption Theories

A wide body of research focuses on identifying factors affecting people’s intentions to use new technologies and how these intentions predict actual usage (Davis, Bagozzi, & Warshaw, 1989). The following sections summarize some of the major theories.

**Innovation diffusion theory (IDT).** IDT seeks to explain the process by which users adapt technological advances (Rogers, 1995; Figure 1). The theory’s core constructs and definitions are shown in Table 2. Since the 1960s, it has been applied to the study of topics as diverse as agricultural tools and organizational innovation (Tornatzky & Klein, 1982). The five factors from this model along with two additional factors introduced by Moore and Benbasat (1991) were adapted to information system innovations (Table 3; Figure 2).

**Theory of reasoned action (TRA).** The TRA is a fundamental model that was created by social psychologists to study conscious intentional behavior (Fishbein, & Ajzen, 1975; Figure 3). It has been incredibly influential and applied to a wide variety of behavior (Sheppard, Hartwick, & Warshaw, 1988). Davis et al. (1989) used it to study acceptance of new technologies and obtained results that were consistent with previous studies of other behavior. The core constructs and definitions are shown in Table 4.

**Theory of planned behavior (TPB).** TPB expanded TRA with the concept of “perceived behavioral control” (Table 5). Ajzen (1991) reviewed studies that used TPB successfully for a wide range of intentions and behaviors (Figure 4). It has been effective in predicting acceptance and use of many different technologies (Harrison, Mykytyn, & Riemenschneider, 1997).

**Technology Acceptance Model (TAM) and Extended TAM (TAM2).** TAM was designed to predict information technology acceptance and usage related to labor (Figure 5). Unlike TRA, the final conception of TAM does not include the attitude construct; this is to better explain intention parsimoniously. TAM has been widely applied to a diverse set of technologies and users (Table 6).

TAM2 enlarged TAM by including “subjective norm” as an additional predictor of intention in the case of mandatory settings (Venkatesh & Davis, 2000; Figure 6). It is modified from TAM and includes more variables (Table 7).

**Combined TAM and TPB (C-TAM-TPB).** C-TAM-TPB combines the predictors of TPB with perceived usefulness from TAM to supply a hybrid model (Taylor & Todd, 1995; Table 8; Figure 7).

**Social cognitive theory (SCT).** SCT is one of the most comprehensive theories of human behavior (Bandura, 1986).
Table 2. Innovation Diffusion Theory.

| Core constructs     | Definitions                                                                 | References         |
|---------------------|-----------------------------------------------------------------------------|--------------------|
| Relative advantage  | “The degree to which an innovation is perceived to be better than the idea it supersedes” | Rogers (1995)     |
| Compatibility       | “The degree to which an innovation is perceived as consistent with the existing values, past experiences and needs of potential adopters” |                    |
| Complexity          | “The degree to which an innovation is perceived as relatively difficult to understand and use” |                    |
| Trialability        | “The degree to which an innovation may be experimented with on a limited basis” |                    |
| Observability       | “The degree to which the results of an innovation are visible to others” |                    |

Table 3. Refined IDT.

| Core constructs      | Definitions                                                                 | References         |
|----------------------|-----------------------------------------------------------------------------|--------------------|
| Relative advantage   | “The degree to which an innovation is perceived as being better than its precursor” | Moore and Benbasat (1991) |
| Ease of use          | “The degree to which an innovation is perceived as being difficult to use” |                    |
| Image                | “The degree to which use of an innovation is perceived to enhance one’s image or status in one’s social system” |                    |
| Visibility           | “The degree to which one can see others using the system in the organization” |                    |
| Compatibility        | “The degree to which an innovation is perceived as being consistent with the existing values and past experiences of potential adopters” |                    |
| Results demonstrability | “The tangibility of the results of using the innovation, including their observability and communicability” |                    |
| Voluntariness of use | “The degree to which use of the innovation is perceived as being voluntary or through one’s free will” |                    |

Note. IDT = innovation diffusion theory.

Figure 2. Refined IDT (Moore & Benbasat, 1991).
Note. IDT = innovation diffusion theory.

Figure 3. TRA (Fishbein & Ajzen, 1975).
Note. TRA = theory of reasoned action.
Table 4. Theory of Reasoned Action.

| Core constructs       | Definitions                                                                 | References                  |
|-----------------------|-----------------------------------------------------------------------------|------------------------------|
| Attitude toward behavior | “An individual’s positive or negative feelings (evaluative effect) about performing the target behavior” | Fishbein and Ajzen (1975)    |
| Subjective norm       | “The person’s perception that most people who are important to him think he should or should not perform the behavior in question” |                             |

Table 5. Theory of Planned Behavior.

| Core constructs       | Definitions                                                                 | References                  |
|-----------------------|-----------------------------------------------------------------------------|------------------------------|
| Attitude toward behavior | Adapted from TRA.                                                            | Ajzen (1991)                 |
| Subjective norm       | Adapted from TRA.                                                            |                              |
| Perceived behavioral control | “The perceived ease or difficulty of performing the behavior”            |                              |

Note. TRA = theory of reasoned action.

Compeau and Higgins (1995) extended and applied SCT to the context of computer utilization (Table 9).

Model of Personal Computing (PC) utilization (MPCU). Derived largely from a theory of human behavior, this model presents a competing perspective to those proposed by TRA and TPB (Table 10). Thompson, Higgins, and Howell (1991) adapted and refined a model for intermediate system contexts and used the model to predict personal computer utilization. However, the nature of the model makes it particularly suitable for predicting individual acceptance and use of a range of information technologies.

MM. A significant body of research in psychology has sustained general motivation theory as an explanation for behavior. Several studies have examined motivational theory and adapted it to specific contexts (Table 11).

UTAUT

UTAUT is a model of individual acceptance that is compiled from eight models and theories (TRA, TAM, MM, TPB, C-TAM-TPB, MPCU, IDT, and SCT; Venkatesh, Morris, Davis, & Davis, 2003; Figure 8).

Each of the constructs mentioned in IDT, TRA, TAM, TPB, C-TAM-TPB, MPCU, MM, and SCT pertained to one of UTAUT’s main constructs and measurement items (Table 12).

The purpose of formulating UTAUT was to integrate the fragmented theory and research on individual acceptance of information technology into a unified theoretical model (Venkatesh et al., 2003). To do so, the eight specific models of the determinants of intention and usage of information technology were compared and conceptual and empirical similarities across these models were used to formulate UTAUT (Venkatesh et al., 2003; Table 13).

To conclude, UTAUT advanced individual acceptance research by unifying the theoretical perspectives common in the literature and incorporating four moderators to account for dynamic influences, including gender, age, voluntariness, and experience (Venkatesh et al., 2003). It seems reasonable to assume that UTAUT could be used to study the acceptance and use of English learning websites. We therefore introduced subjective task value to UTAUT in addressing our research question.

Method

Research Model

In this study, we use UTAUT to study acceptance and use of English E-learning websites by Taiwanese college students. According to UTAUT, four factors influence use of English E-learning websites: performance expectancy, effort expectancy, social influence, and facilitating conditions.

We did not consider the moderating effect of gender, age, experience, and voluntariness in this study. Because our participants are all college students, the gender, age, experience,
and voluntariness are similar. Therefore, we have made some alterations to our research model (Figure 9).

**Hypotheses**

The UTAUT model integrates the eight theoretical models noted above and is composed of the core determinants of usage intention (Venkatesh et al., 2003). Of the four core determinants, performance expectancy, effort expectancy, and social influence significantly predict intention. The UTAUT model is well suited to the context of this study. Based to these observations, we developed the hypotheses of this study.

- **Hypothesis 1:** Performance expectancy positively affects users’ intentions to use English E-learning websites.
- **Hypothesis 2:** Effect expectancy positively affects users’ intentions to use English E-learning websites.
- **Hypothesis 3:** Social influence positively affects users’ intentions to use English E-learning websites.
- **Hypothesis 4:** Facilitating conditions of English E-learning websites positively affects users’ use behaviors of actually using English E-learning websites.
- **Hypothesis 5:** Users’ behavioral intentions to use English E-learning websites positively affect the users’ use behavior of actually using English E-learning websites.

**Procedures**

The data were gathered from college students in Taiwan. The questionnaire of this study was modified from the question items of Venkatesh et al. (2003). Because the questions from the Chinese questionnaire were translated from English, the questionnaire was first pretested on four Taiwanese college students and was then slightly modified according to their feedback before being scanned by two foreign language professors. The initial tests demonstrated high reliability. The questionnaire was placed on the MY3Q questionnaire website (http://www.my3q.com) and sent to a random sample of Taiwanese college students.

**Participants**

The participants of this study are college students in Taiwan. We collected data from 176 respondents from more than 10 Taiwanese colleges. The main purpose was to collect data regarding Taiwanese college students’ English E-learning websites use intentions.
Table 7. TAM2.

| Core constructs       | Definitions                                                                 | References                  |
|-----------------------|-----------------------------------------------------------------------------|-----------------------------|
| Perceived usefulness  | “The degree to which a person believes that using a particular system would enhance his or her job performance” | Venkatesh and Davis (2000) |
| Perceived ease of use | “The degree to which a person believes that using a particular system would be free of effort”                         |                             |
| Subjective norm       | Adapted from TRA/TPB.                                                        |                             |

Note. TAM2 = extended technology acceptance model; TRA = theory of reasoned action; TPB = theory of planned behavior.

Table 8. C-TAM-TPB.

| Core constructs       | Definitions                                                                 | References                  |
|-----------------------|-----------------------------------------------------------------------------|-----------------------------|
| Attitude toward behavior | Adapted from TRA/TPB.                                                        | Taylor and Todd (1995)      |
| Subjective norm       | Adapted from TRA/TPB.                                                        |                             |
| Perceived behavioral control | Adapted from TRA/TPB.                                                        |                             |
| Perceived usefulness  | Adapted from TAM.                                                            |                             |

Note. C-TAM-TPB = model combining the technology acceptance model and theory of planned behavior; TRA = theory of reasoned action; TPB = theory of planned behavior; TAM = technology acceptance model.

Figure 7. C-TAM-TPB (Taylor & Todd, 1995).

Note. C-TAM-TPB = model combining the technology acceptance model and theory of planned behavior.

Instrument

A survey questionnaire was used to collect data regarding use of English E-learning websites among college students in Taiwan. In addition to demographic information, this paper-based questionnaire collected data from individual users of English E-learning websites based on a number of constructs in the research model. Earlier research by Venkatesh et al. (2003) had validated measures for each of the constructs; we decided to include those validated items in our questionnaire. We used a Likert-type 5-point scale: 1 = strongly disagree and 5 = strongly agree. A list of validated items for each construct is provided in Table 14.

Analysis

We used the Statistics Package for Social Science (SPSS) system to analyze the data using reliability analysis, correlation analysis, and regression analysis.

Reliability analysis. Reliability analysis is a measure to define the degree to which measurements are free from error and therefore yield consistent results.

Correlation analysis. Correlation analysis is a measure of the degree to which a change in the independent variable will result in a change in the dependent variable.

Regression analysis. Regression analysis includes any techniques for modeling and analyzing several variables, with a focus on the relationship between a dependent variable and one or more independent variables.

Results

Analysis

Descriptive analysis. All the 176 respondents of the questionnaire were Taiwanese college students. Table 15 represents the demographics of the respondents.

The results showed that more males than females participated in the study. According to these descriptive statistics, most of the respondents were seniors. Sixty-seven percent were not language majors (Figure 10).

Reliability analysis. The data indicate that the measures are robust in terms of their internal consistency reliability as indexed by composite reliability. The reliability of the collected data in this study was assessed by the Statistical Package for Social Science (SPSS). The composite reliabilities ranged from 0.76 to 0.95, which exceed the recommended threshold value of 0.70. Reliability results are given in Table 16.
Table 9. Social Cognitive Theory.

| Core constructs                  | Definitions                                                                 | References                      |
|----------------------------------|-----------------------------------------------------------------------------|---------------------------------|
| Outcome expectations-performance | “The performance-related consequence of the behavior. Specifically, performance expectations address job-related outcomes” | Bandura (1986), Compeau and Higgins (1995) |
| Outcome expectations-personal    | “The personal consequence of the behavior. Specifically personal expectations address the individual esteem and sense of accomplishment” |                                |
| Self-efficacy                    | “Judgment of one’s ability to use a technology to accomplish a particular job or task” |                                |
| Affect                           | “An individual’s liking for a particular behavior”                           |                                |
| Anxiety                          | “Evoking anxious or emotional reactions in regard to performing a behavior”  |                                |

Table 10. Model of PC Utilization.

| Core constructs         | Definitions                                                                 | References                     |
|-------------------------|-----------------------------------------------------------------------------|--------------------------------|
| Job-fit                 | “The extent to which an individual believes that using [a technology] can enhance the performance of his or her job” | Thompson, Higgins, and Howell (1991) |
| Complexity              | “The degree to which an innovation is perceived as relatively difficult to understand and use” |                                |
| Long-term consequences  | “Outcomes that have a pay-off in the future”                                |                                |
| Affect toward use       | “Feelings of joy, elation, or pleasure, or depression, disgust, displeasure, or hate associated by an individual with a particular act” |                                |
| Social factors          | “The individual’s internationalization of the reference group’s subjective culture and specific interpersonal agreements that the individual has made with others, in specific social situations” |                                |
| Facilitating conditions | “ Provision of support for users of PCs may be one type of facilitating condition that can influence system utilization” |                                |

Table 11. Motivational Model.

| Core constructs                  | Definitions                                                                 | References                      |
|----------------------------------|-----------------------------------------------------------------------------|---------------------------------|
| Extrinsic motivation             | The perception that users will want to perform an activity “because it is perceived to be instrumental in achieving valued outcomes that are distinct from the activity itself, such as improved job performance, pay, or promotions” | Davis, Bagozzi, and Warshaw (1992) |
| Subjective norm                  | The perception that users will want to perform an activity “for no apparent reinforcement other than the process of performing the activity per se” |                                |

Figure 8. UTAUT (Venkatesh, Morris, Davis, & Davis, 2003).

Note: UTAUT = unified theory of acceptance and use of technology.

Correlation analysis. Convergent validity and discriminant validity are assessed by Pearson correlation analysis. Guidelines suggest that factor loadings be greater than 0.50 (Hair, Anderson, Tatham, & Black, 1998) or, under a stricter criterion, greater than 0.70 (Fornell, 1982). All of the factor results of items in this research model are higher than 0.50; most of them are above 0.70. Every item is loaded significantly (p < .01 in all cases) on its constructs. Therefore, all constructs in the model have adequate reliability and convergent validity. Correlation results are shown in Table 17.

Regression analysis. We use regression analysis to investigate the influence of performance expectancy, effort expectancy and social influence on intention to use. The results show that performance expectancy, effort expectancy, and social
Table 12. The Constructs Mentioned in IDT, TRA, TAM, TPB, C-TAM-TPB, MPCU, MM, and SCT.

| Core constructs | Constructs and theories | References |
|-----------------|-------------------------|------------|
| Performance expectancy | Perceived usefulness (TAM/TAM2 and C-TAM-TPB) | Davis (1989) |
| Extrinsic motivation (MM) | Davis, Bagozzi, and Warshaw (1992) |
| Job-fit (MPCU) | Thompson, Higgins, and Howell (1991) |
| Relative advantage (IDT) | Moore and Benbasat (1991) |
| Outcome expectations (SCT) | Compeau and Higgins (1995) |
| Effort expectancy | Perceived ease of use (TAM/TAM2) | Davis (1989) |
| Complexity (MPCU) | Thompson et al. (1991) |
| Ease of use (IDT) | Moore and Benbasat (1991) |
| Social influence | Subjective norm (TRA, TAM2, TPB and C-TAM-TPB) | Ajzen (1991), Fishbein and Ajzen (1975), Taylor and Todd (1995) |
| Social factors (MPCU) | Thompson et al. (1991) |
| Image (IDT) | Moore and Benbasat (1991) |
| Facilitating conditions | Perceived behavioral control (TPB and C-TAM-TPB) | Ajzen (1991), Taylor and Todd (1995) |
| Facilitating conditions (MPCU) | (Thompson et al., 1991) |
| Compatibility (IDT) | Moore and Benbasat (1991) |

Note: IDT = innovation diffusion theory; TRA = theory of reasoned action; TAM = technology Acceptance Model; TPB = theory of planned behavior; C-TAM-TPB = model combining the technology acceptance model and theory of planned behavior; MPCU = model of PC utilization; MM = motivational model; SCT = social cognitive theory; TAM2 = extended technology acceptance model.

Table 13. Unified Theory of Acceptance and Use of Technology.

| Core constructs | Definitions | References |
|-----------------|-------------|------------|
| Performance expectancy | “The degree to which an individual believes that using the system will help him or her attain gains in job performance” | Venkatesh, Morris, Davis, and Davis (2003) |
| Effort expectancy | “The degree of ease associated with the use of the system” | |
| Social influence | “The degree to which an individual perceives that important others believe he or she should use the new system” | |
| Facilitating conditions | “The degree to which an individual believes that an organizational and technical infrastructure exists to support use of the system” | |

Figure 9. The UTAUT model for English E-learning website adoption by college students in Taiwan.

Note. UTAUT = Unified Theory of Acceptance and Use of Technology.

influence significantly affect intention to use. The results are presented in Table 18.

We again use regression analysis to study the influence of intention to use on user behavior. The results show that facilitating conditions and intention to use significantly affect user behavior. The results are presented in Table 19.

Confirmation of Hypotheses

The influence of students’ performance expectancy for using English E-learning websites on intention to use English E-learning websites. The results showed that Performance Expectancy positively affects users’ intentions to use English E-learning websites ($\beta = .346, p < .001$). Therefore, H1 is supported. This means that when students expect an English E-learning website to increase their performance, they increase their intentions to use it.

The influence of students’ Effect Expectancy for using English E-learning websites on intention to use English E-learning websites. The results showed that Effect Expectancy positively affects users’ intentions to use English E-learning websites ($\beta = .154, p < .05$). Therefore, H2 is supported. This means...
Table 14. Questionnaire Items.

| Constructs | Question description | References |
|------------|----------------------|------------|
| PE         | PE1: Using English E-learning websites improves my learning results | Venkatesh, Morris, Davis, and Davis (2003) |
|            | PE2: Using English E-learning websites enhances my learning motivation | |
|            | PE3: Using English E-learning websites increases my performance in my learning activities | |
|            | PE4: I would find English E-learning websites useful in my school study | Venkatesh et al. (2003) |
| EE         | EE1: I would find English E-learning websites is easy for me to use | Venkatesh et al. (2003) |
|            | EE2: I would find it easy for me to become skillful at using English E-learning websites | |
|            | EE3: I would become proficient at using English E-learning websites | |
|            | EE4: My learning activities with English E-learning websites are clear and understandable | |
| SI         | SI1: People who are important to me think that I should use English E-learning websites | Venkatesh et al. (2003) |
|            | SI2: People who affect my learning behavior think that I should use English E-learning websites | |
|            | SI3: My peers and teachers think that I should use English E-learning websites | |
|            | SI4: I think that using English E-learning websites is fashionable | |
| FC         | FC1: I have the resources necessary to use English E-learning websites | Venkatesh et al. (2003) |
|            | FC2: I have the knowledge necessary to use English E-learning websites | |
|            | FC3: I think that using English E-learning websites fits well with the way I like to learn | |
|            | FC4: If I have problems using English E-learning websites, I could solve them very quickly | |
| BI         | BI1: I intend to use English E-learning websites in my future learning activities | Venkatesh et al. (2003) |
|            | BI2: I would use English E-learning websites to improve my English | |
|            | BI3: I plan to use English E-learning websites in the next 2 months | |

Note. PE = performance expectancy; EE = effort expectancy; SI = social influence; FC = facilitating conditions; BI = behavior intention.

Table 15. Demographics of Respondents.

| Gender       | Male  | 97   | 55.11% |
|--------------|-------|------|--------|
|              | Female| 79   | 44.89% |
|              |       | 176  | 100%   |
| Region       | North | 31   | 17.61% |
|              | Central| 19   | 10.80% |
|              | South | 45   | 25.57% |
|              | East  | 3    | 1.70%  |
|              | Others| 78   | 44.32% |
|              |       | 176  | 100%   |
| Department   | Foreign languages major | 57   | 32.39% |
|              | Nonforeign language major | 119  | 67.61% |
|              |       | 176  | 100%   |
| Grade        | Freshman | 13   | 7.39%  |
|              | Sophomore| 29   | 16.46% |
|              | Junior   | 33   | 18.76% |
|              | Senior   | 86   | 48.87% |
|              | Others   | 15   | 8.52%  |
|              |       | 176  | 100%   |

Table 16. Reliability of Research Variable.

| Variable                  | Cronbach’s alpha |
|---------------------------|------------------|
| Performance expectancy    | .837             |
| Effort expectancy         | .824             |
| Social influence          | .784             |
| Facilitating conditions   | .874             |
| Behavioral intention      | .853             |
| Use behavior              | .553             |
| Cronbach’s alpha          | .915             |
Table 17. Correlation of Adoption Factors.

|   | PE       | EE    | SI    | FC    | BI    | UB    |
|---|----------|-------|-------|-------|-------|-------|
| PE| 1.000    |       |       |       |       |       |
| EE| .789**   | 1.000 |       |       |       |       |
| SI| .694**   | .676**| 1.000 |       |       |       |
| FC| .761**   | .794**| .743**| 1.000 |       |       |
| BI| .711**   | .719**| .735**| .835**| 1.000 |       |
| UB| .500**   | .522**| .518**| .527**| .507**| 1.000 |

Note. PE = performance expectancy; EE = effort expectancy; SI = social influence; FC = facilitating conditions; BI = behavior intention; UB = use behavior. **Correlation is significant at the .01 level (2-tailed).

Table 18. Regression of Adoption Factors on Intention to Use.

|   | β     | t-value |
|---|-------|---------|
| PE| .346  | 5.292***|
| EE| .154  | 2.398*  |
| SI| .282  | 5.484***|
| R²| .683  |         |
| Adjusted R²| .677 |         |

Note. PE = performance expectancy; EE = effort expectancy; SI = social influence. *p < .05. **p < .01. ***p < .001.

Table 19. Regression of Intention to Use on User Behavior.

|   | β     | t-value |
|---|-------|---------|
| FC| .066  | 2.047*  |
| BI| .098  | 2.604***|
| R²|       | .275    |
| Adjusted R²|       | .267 |         |

Note. FC = facilitating conditions; BI = behavior intention. *p < .05. **p < .01. ***p < .001.

Table 20. The Confirmation of Hypotheses.

| Hypotheses | Confirmed |
|------------|-----------|
| H1: Performance expectancy positively affects users’ intentions to use English E-learning websites | Yes |
| H2: Effect expectancy positively affects users’ intentions to use English E-learning websites | Yes |
| H3: Social influence positively affects users’ intentions to use English E-learning websites | Yes |
| H4: Facilitating conditions of English E-learning websites positively affects users’ use behavior of actually using English E-learning websites | Yes |
| H5: Users’ behavioral intentions to use English E-learning websites positively affect the users’ use behavior of actually using English E-learning websites | Yes |

Discussion

Conclusion

The results support the UTAUT model’s use to study the acceptance of English E-learning websites. The UTAUT model shows that students’ use behavior of English E-learning websites depends on performance expectancy, effort expectancy, and social influence. Therefore, we suggest that web designers improve knowledge management functions and make user interfaces easier to operate. Furthermore, students should be notified that the websites can be supported by facilitating conditions.

Limitations and suggestions

Because this study only examines the acceptance of English E-learning websites among Taiwanese college students, the results may not be generalized to other E-learning systems and countries. Therefore, we suggest that a future researcher validate the model and findings in other E-learning systems or other countries.

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