

Assessing User Acceptance toward Blog Technology Using the UTAUT Model

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Abstract: Blogs are among the many commonly used technologies for education and learning. They are also both conversational technologies and constructivist learning tools. Their interactive, collaborative, user-friendly, and instant archival features have transformed blogs into effective tools for enhancing case-based teaching methods in the asynchronous nature of the online environment. This study investigated the student populace's acceptance of the blog technology through the Unified Theory of Acceptance and Use of Technology (UTAUT) framework. UTAUT integrates eight theories from social psychology and sociology in order to examine the effects of major factors on behavioral intention and actual use of blog to learn e-business course materials and topic discussions. The results showed that both social influence and performance expectancy had a significant relationship with behavioral intention, whereas effort expectancy did not. In this study, behavioral intention did not have a significant relationship with actual usage level of blogs as a learning tool.

Keywords: Blog, e-Learning, Technology Acceptance, UTAUT

I. INTRODUCTION

The web log, or better known as blog, started as a means for expressive individuals to post personal diaries online [1]. Blogs have since evolved into a new media with its popularity increasingly rising among different groups and users in the world. Millions of people use blogs in various ways, including publishing information, transferring knowledge, and networking with other bloggers [2]. In a different aspect, blogs as part of user-centered and interactive features of web 2.0 technology enable people to collaborate and share information in the virtual space [3].

Although blogs are commonly known as a popular web 2.0 technology, the adoption of blogs into the higher education system was not popular. Blogs were also known as one of the e-learning tools. The basis for the e-learning concept is that the process of learning can be done anytime and anywhere through a computer. E-learning is a general term for education, training, and information with an emphasis on the gathering of skills and knowledge [4].

Nevertheless, blogs are still utilized in learning activities abroad in the college or high school levels, though only in certain courses. Most of the students in these courses recognize the benefits from studying with the aid of a class

blog. A blog's interactive and instantaneous archival features made it an effective tool for improving case-based teaching via the online environment [3]. The use of blogs also enhances the students' potential in learning and understanding course materials. Blogs are well-suited for the learning environment, especially through its central requirement for writing skills [5].

The format of blog pages can potentially enhance students' analytical and critical thinking. Researchers have also discovered that the students' social interactions with others also improved through the utilization of a blog for learning. The use of a blog encourages social interactions by providing a channel to build a sense of community, to strengthen communication skills, and to write for a real audience [6].

A private university in Jakarta currently has a discussion forum for its students to talk about a specific course, but the forum was not fully utilized by students and lecturers to support their learning sessions. The implementation of a class blog for an e-business course could assist students and lecturers in learning activities much more, in comparison with the utilization of a discussion forum or in-person meetings.

II. PROBLEM FORMULATION

Blogs have the potential to become a useful tool for learning. Numerous studies have identified some beneficial traits of a blog, such as instant archival features [3], excellent adaptability into the learning environment [5], and social interactions improvement [6]. In this study, blogs gave new learning experience for students and lecturers, in addition to face-to-face meetings and off-class sessions. Students were able to access previous materials, review them, and then discussed them with colleagues; all of which would then improve the students' critical thinking and writing skills. For students, a blog can be used as a living record of their learning, a place to pose questions, publish work in progress or provide links to (and comments on) relevant web resources [7]. Despite the many benefits that blogs could provide for educational and learning purposes, there were some challenges to both lecturers and students for implementing a blog into an e-business course. One of the most important challenges for students as active participant in the learning process is developing new, more responsible, and more critical attitude towards learning and towards their own learning outcomes [8]. It is important to conduct study to discover students' attitudes towards current e-learning after the emergence of these new tools, and to know their opinions about adopting new e-learning platform [9].

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In this study, students expected that using blog technology would better help them understand materials than traditional methods would. They themselves decided where, when, how long, and how much they will learn [8]. This provides a logical motivation for students to adopt the blog technology when learning their e-business course materials. Previous studies have shown that blogs enhanced students' potential in learning [3], [5]. Within the context of blog technology acceptance in learning e-business, performance expectancy can be defined as students' expectation that using blog for learning e-business can help them more in understanding a subject matter and improve their performance in a course. Therefore, it can be hypothesized that:

H1: Performance expectancy is directly correlated with the level of intention to adopt blogs as a learning tool.

Secondly, students are unfamiliar with the blog technology used during their learning sessions in the e-business class. Generally, effort expectancy is defined by a system's usability for new user. Information technology offers valuable performance advantages and easiness to perform work. However, this gain in performance is often obstructed by users' unwillingness to utilize available systems [10]. If students were to perceive blogs as being easy-to-use and were to value its usefulness [3], then their attitude towards it would grow stronger. From this logic, it was hypothesized that:

H2: Effort expectancy is directly correlated with the level of intention to adopt blogs as a learning tool.

Thirdly, there is a limited control over a student's level of participation in using the blog for learning e-business course. Blogs are technological tools with high social interaction [6]. In this study, the participation and motivation of the students contribute to the knowledge exchange, since the social exchange behavior cannot be completely controlled. Thus, it was hypothesized that:

H3: Social influence is directly correlated with the level of intention to adopt blogs as a learning tool.

A positive Behavioral Intention was essential in the actual usage of technology [3]. It also had a positively significant influence on technological usage [11]. Therefore, it was hypothesized that:

H4: Behavioral intention is directly correlated with the level of actual usage of blogs as a learning tool.

III. METHOD

This study employed the Unified Theory of Acceptance and Use of Technology (UTAUT) framework with three

variables in order to determine behavioral intention and define the relationship with usage behavior (actual usage) [11].

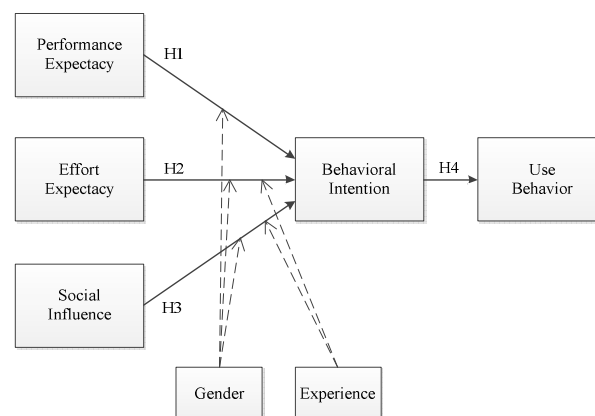


Fig. 1 Research UTAUT Model

Performance expectancy was defined as the degree to which an individual believes that using the system would help the individual improve in job performance [11]. Performance expectancy was a multi-dimensional construct with five components: perceived usefulness, extrinsic motivation [10], job fit [12], relative advantage [13], and outcome expectations [14]. Improving a student's performance expectancy towards blog technology usage was essential to the student's level of intent to adopt the blog for learning (shown in Fig. 1).

Effort expectancy was defined as the degree of usage ease associated with the system [11]. User-friendly interface is an important contribution to the popularization of blogs in the web [3]. The construct has three components: perceived ease of use [11], complexity [12], and ease of use [13]. Lowering the effort was required to use the blogs should also contribute to the intention of using blogs [3].

Social influence was defined as the degree to which an individual perceives the importance others imposed on the new system [11]. This construct consisted of subjective norm, social factors [12], and image [13]. In the class blog usage, lecturer can encourage his or her students to use the blog for discussions and submit assignments for the course. Faculty also can give more support to students for using the blog and allow them to use it as a tool for enhancing their study needs [3]. Social influence can also originate from reference group, such as friends from other institutes and group members.

Behavioral intention was determined by four constructs, as mentioned in the UTAUT formulation. However, for this study, only two of these constructs were used. Demographic questions, such as gender, acted as the indicator for performance expectancy, effort expectancy, and social influence results. Experience acted as the indicator for effort expectancy and social influence results.

A six-point scale was used for all of indicator's questionnaires, ranging from 1 ("extremely unlikely") to 6

“extremely likely”). This scale was used for scoring participants’ responses for all of the indicators and was used in the quantitative data method analysis.

Independent variables for this study were performance expectancy (X_1), effort expectancy (X_2), and social influence (X_3). Dependent variables were behavioral intention (Y_1) and use behavior/actual use (shown in Figure 1). Three items from demographic questions (weekly numbers of posted messages, duration of blog usage, and number of feedback messages) were used as the proxies of use behavior/actual use.

Reliability analysis of the instrument was assessed by Cronbach’s α test, as in previous research [3], to assess the internal consistency or stability of the model used to measure the constructs of proposed framework, as shown in Figure 1. All of Cronbach’s α values must exceed the threshold value of 0.7 to indicate that the adopted instrument has a high internal reliability [15]. Table 1 below lists the Cronbach’s α scores:

Table 1. Cronbach’s α Scores

Constructs	Cronbach’s α
Performance Expectancy	0.88
Effort Expectancy	0.88
Social Influence	0.78
Behavioral Intention	0.91

IV. THE BLOG

The term “conversational technology” was derived from the work of Levine, Locke, Searls, and Weinberger [16] that showed one of the key concepts was that “markets were conversations” and that knowledge was created and shared using question and answer dialog. Conversational technologies encompass a wide range of systems and software, many of which are familiar, including e-mail, instant messaging, web pages, discussion forums, audio and video content/streaming, wikis, and weblogs. Hsu [1] discussed the issues, impacts, and applications relating to IM, blogs, wikis, and podcasts. These were technologies that were newer, have a growing base of users, and are starting to gain recognition as viable tools for education.

Hsu [1] stated that earlier paradigms of teaching emphasized print-based materials for instruction, which included printed textbooks, paper-based instructional materials, and written tutorials; all of which were grounded in the notion that the teacher, lecturer, and instructional materials form not only the basis but also the authorities in the educational process. The transmission of material from the teacher (lecture) and/or textbook to the student (called the “print model”) was still the central basis of most teaching, even if they were supplemented with other methods including discussion and other forms of student interaction/participation [17]. Nowadays, the paradigms are gradually shifting towards a new concept that learning and teaching

should go beyond printed materials toward a greater emphasis on group work, fostering student communities, and encouraging student participation. The use of conversational technologies can have a positive impact because they attempt to not only improve upon the print approach but also use secondary-oral techniques [1]. In other words, the introduction of secondary-oral techniques can be used to improve the overall learning experience. Ferris and Wilder [17] also stated that there was an opportunity to work and learn collaboratively, explore, analyze, engage in discussion, and otherwise “learn” in new and innovative ways. The term “constructivist learning tool” has also become associated with these, particularly blogs and wikis, in that they have a key characteristic of allowing users to develop and maintain their own contents. Some of the characteristics of constructivist learning include engagement, active learning, collaboration, real world based, and the usage of reflection as a part of the learning process [18]. It should be noted that these technologies and tools are best suited to course structures where class collaboration and communication are encouraged, rather than those with an emphasis on lectures and a presentation of factual information. In addition, in courses with substantial group work or projects where a collaborative document is created, the use of these would be especially helpful and useful [1]. Both hybrid and full distance learning courses would be situations in which these could also be used effectively.

Implementation of the blog was introduced into the class to students and lecturers; these include instructions on how to use the blog for learning sessions, such as discussions and assignments. Many free blog software were available in the market but Wordpress was chosen for this study, for various reasons. First, users can rearrange widgets without editing PHP or HTML code; they can also install and switch between themes. The PHP and HTML codes in the themes can also be edited for more advanced customizations. Secondly, WordPress also features an integrated link management, a search engine-friendly, clean permalink structure, the ability to assign nested, multiple categories for articles. Thirdly, automatic filters are also included, providing standardized formatting and styling of text in articles. Fourthly, WordPress also supports tagging of posts and articles, the trackback and pingback standards for displaying links to other sites that have linked to a post or article. Lastly, the groundbreaking and very popular feature of WordPress is its rich plug-in architecture that allows users and developers to extend its functionality beyond the features that become a part of the base install. Hsu [1] summarized weblog (blogs) characteristics for e-learning tools as shown in table 2 below:

Table 2. Weblog (Blogs) Characteristics

Weblogs (Blogs)	
Description	A technology that allows a sequence of entries (online diary, journal) to be posted and published online
Advantages	Self reflection and critical thinking are encouraged
	Students authenticity through publication
	Social presence
	Development of a learning community
	Active learning encouraged
Disadvantages	Ability to receive and respond to feedback
	Controlled primarily by blog author
Educational Applications	Editing/modifications is not open as in a wiki
	Online learning journal
	Problem solving , discussion, manipulation space
	Online gallery space (writings, portfolio)
Course/Subject Suitability	Peer review exercises
	Writing courses
	Foreign language courses
	Research seminars

The blog was created in April 2011 and located at <http://ebusinesscourse.wordpress.com/> for this study. The blog's main page was made from a static page for introduction and has two categories for e-business course: Assignments and Discussions. Both of these categories that were made from static pages contained post links from appropriate tags (Assignment or Discussion) for easy access for students and lecturers as shown in Fig. 2.

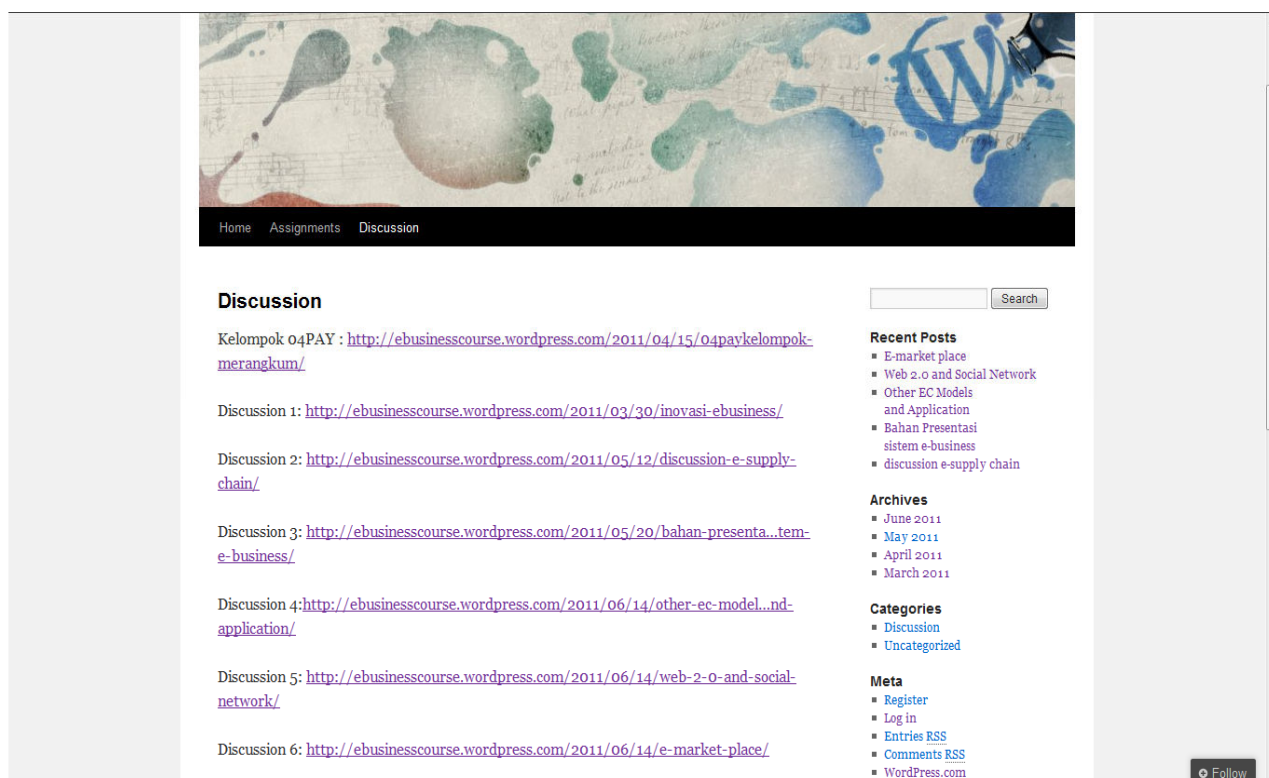


Fig. 2 Discussion Main Page

Fig. 3 shows that every blog post have its own page for viewing and commenting. Students and class representative needed to input their name, student ID, and email as requirements to post or reply comment on a specific blog post.

Every blog post had its own page for viewing and commenting, which were then automatically archived by WordPress.

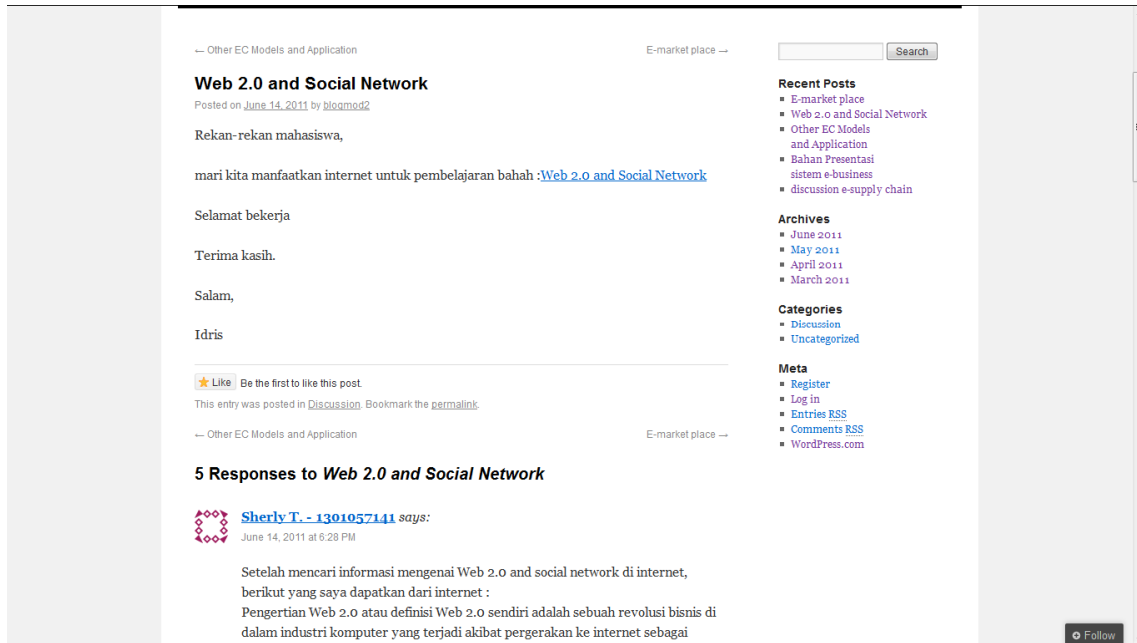


Fig. 3 Blog Post Example

Three user IDs were created to maintain and moderate this blog. One of them was the lecturer's ID and the rest were class representative ID selected by the lecturer to assist in the

posting of discussion materials about e-business topics. Both lecturer and class representative can moderate the blog using Administrator Dashboard as shown in Fig. 4.

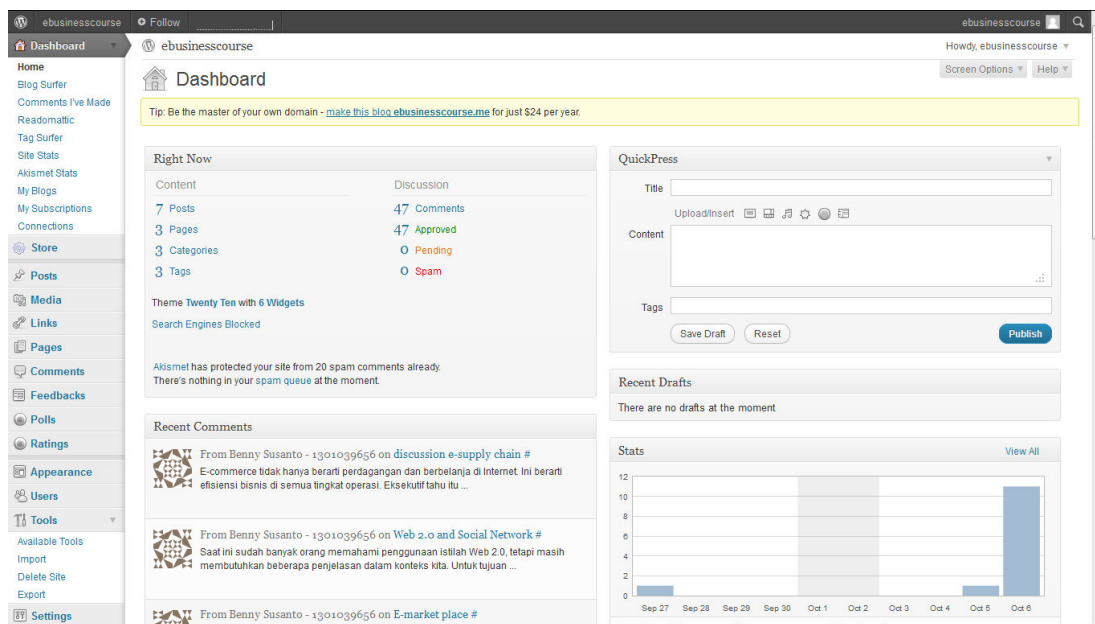


Fig. 4 Administrator Dashboard

WordPress provided the overall total views of the e-business blog per day, week, or month, as well as the total comments based on per student's name. Fig. 5 shows an example of blog statistic page for October 6, 2011. These counts can also be broken-down into views per blog post with the same time range as the overall total views. Comments

also can be viewed and counted per blog post as shown in Fig. 6.

WordPress did not provide the counts for the students' log time or views per student, rendering the reliance on demographic questions for the weekly duration of blog usage for each student.

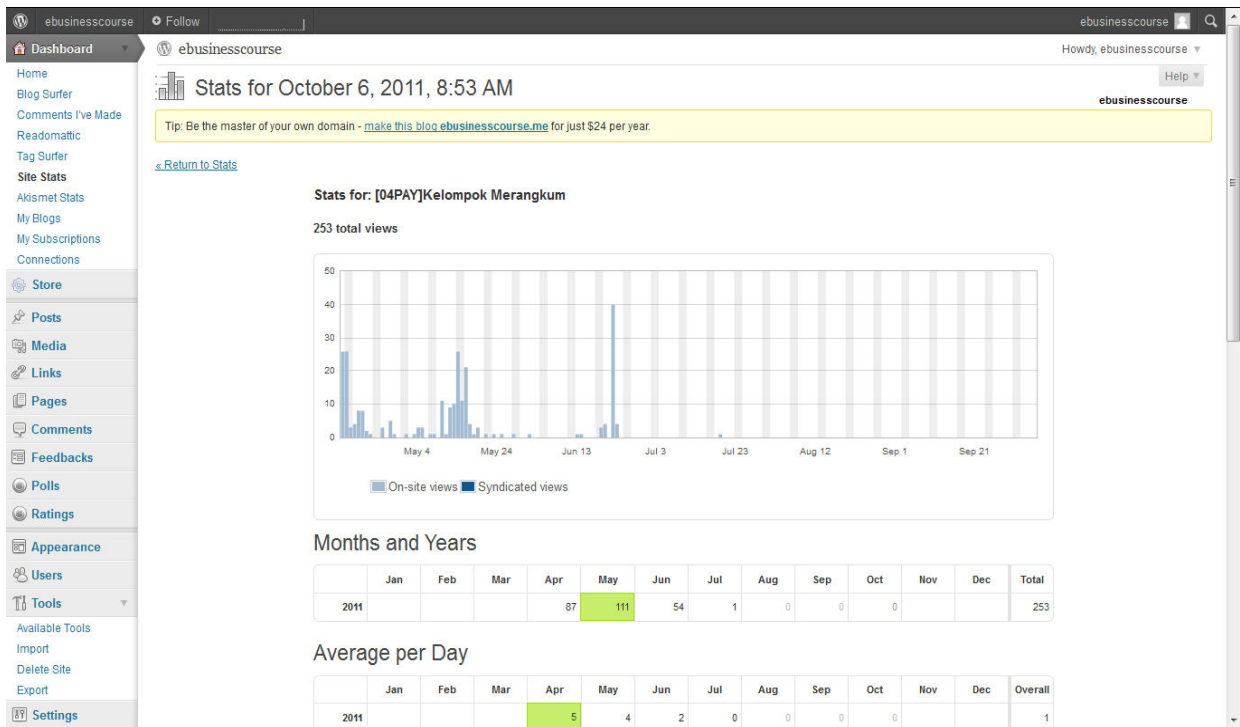


Figure 5. Blog Statistics Page

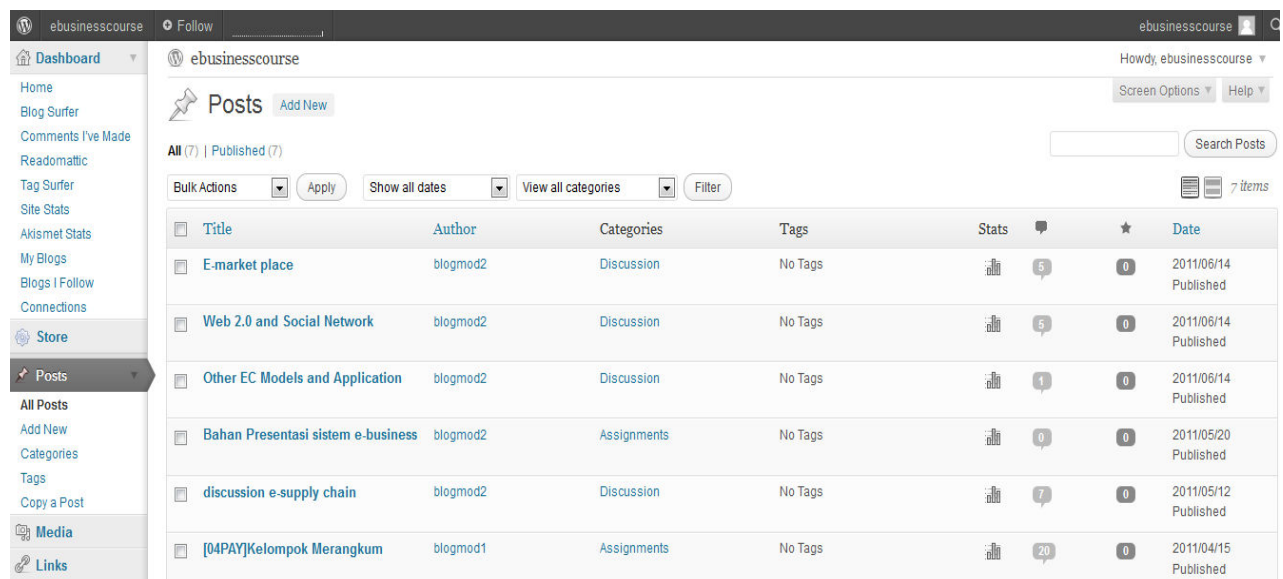


Figure 6. Blog Post Statistic Page

V. INSTRUMENTATION AND DATA COLLECTION

The instrument used to measure the variables was a survey based on previous research [3], [11]. Performance expectancy was a multi-dimensional construct consisting of perceived usefulness, relative advantage, job-fit, and outcome expectations. Effort expectancy consisted of complexity and ease of use. Social influence consisted of three dimensions: subjective norms, social factors, and image. Lastly, Behavioral intention is a one-dimensional construct. The survey instrument had a six-point scale ranging from “extremely unlikely” to “extremely likely.”

Demographic question items based on the UTAUT theory model were also included in the instrument. Participants’ age, gender, blogging experience, weekly usage duration of blogs, weekly numbers of posted message, and weekly number of feedback numbers were items for participants’ demographic data. Data were collected from the blog system to view students’ activity over research period (6-7 weeks). The survey was administered on the last session of each class to collect data about student experience while using the blog system in their learning and about their views in continuing to use the blog system in the future or for another course.

VI. DATA ANALYSIS

Data obtained from observations and surveys were analyzed using the IBM SPSS Statistics 19 for descriptive qualitative data output and quantitative statistical data output. Demographic items were analyzed by descriptive analysis method to stratify demographic data in categorical orders. T-test analytical method was used to determine the difference in means between two groups (male and female). Qualitative data were reported in tables and percentages. Quantitative data were analyzed with linear regression method to determine the predictive power of independent variables for behavioral intention and to determine whether or not behavioral intention as an independent variable has a significant influence on usage behavior. The linear regression method was also used in previous studies [4], [19].

There were two models constructed for regression analysis. The first model was to validate H_1 , H_2 , and H_3 that were relevant to behavioral intention (Y_1). The second model was to validate behavioral intention’s significant influence towards use behavior/actual use, which then validated H_4 . The model is as follows:

$$(1) Y_1 = \text{Constant} + \beta X_1 + \beta X_2 + \beta X_3$$

VII. RESULTS

At the end of the experimental period, students were asked to fill a survey distributed by the researchers in the classroom after they were given explicit instruction on how to fill out the survey. After administrating the survey, a total of 49 entry units were deemed as valid samples. Males and females account for 75.5% and 24.5% of the valid samples, respectively. Majority of the students (71.4%) spent less than an hour using the blog every week and 65.3% had less than one year of blog usage experience. Descriptive statistics also showed that 59.2% of students posted only one or no message in a week while 57.1% never responded or had only one feedback message.

The first model was done to validate that H_1 , H_2 , and H_3 have significant influences on behavioral intention (Y_1). These three independent variables together can explain 72.1% of the behavioral intention to use blog for learning. These independent variables also have varying power for predicting behavioral intention, in the order of social influence ($\beta = .644$), performance expectancy ($\beta = .346$), and effort expectancy ($\beta = -.104$). Performance expectancy and social influence were significant but effort expectancy was not. Thus, H_1 and H_3 were accepted, but H_2 was rejected. The first linear regression model predictions are described below:

Table 3. Regression Analysis (DV = Behavioral Intention)

	Standardize β - Coefficients	t-value	Sig.
Performance Expectancy	.346	2.720	.009*
Effort Expectancy	-.104	-.941	.352
Social Influence	.644	6.166	.001*

$$(1) Y_1 = 1.018 + .335 (X_1) - .112 (X_2) + .588 (X_3)$$

$$R^2 = .721. \text{ Adjusted } R^2 = .703$$

$$*p < .05$$

Table 3 shows that social influence had a positively significant influence on behavioral intention. The result was consistent with findings in previous studies [3], [20], [21]. The interactivity functions of e-learning media captured most of students’ attention. They agreed that the e-learning media was well-suited for collaboration and knowledge sharing [9]. This illustrated that social factors and environment are powerful forces in encouraging students to use the blog in e-business learning. To accelerate blog implementation in e-business learning, peer encouragement is important. The university and lecturers may influence students for using the blog technology by supporting it and speaking positively about this technology during course orientation. By encouraging students with these approaches, student’s behavioral intention to adopt it should increase accordingly.

Performance expectancy also had positive significant influence on behavioral intention. The result was consistent with findings in previous studies [3], [11], [20], [21]. By using a blog for e-business learning, discussion can be extended beyond class time and without limitations on which students can participate in the discussion. Students can do so at their own convenience and respond to discussion topics that are interesting to them.

Effort expectancy did not show significant influence for behavioral intention. The result was consistent with findings in some previous studies [20], [21], while other studies reported a positive significant influence between the two factors [3], [11]. In the context of a university, lower effort expectancy can come from two sources: instructors and schools [3]. In this study, lower effort expectancy in using blog technology did not have significant effect on the student's behavioral intention since it did not improve the adoption of blog technology. The negative influence of effort expectancy may have been caused by the participants' age (19-21 years) and the fact that most of them (65.3%) had only less than a year's experience in blogging.

The second model is performed to validate that Behavioral intention had significant influence on actual use. Weekly usage duration, weekly numbers of posted messages, and weekly numbers of feedback messages are the proxies for the actual use variable. Table 4 shows that behavioral intention did not have significant relationships with all three proxies. In addition, the behavioral intention factor accounts for 4.4% of variance in weekly usage duration, 1.1% of variance in weekly numbers of posted messages, and 1% of variance in weekly numbers of feedback messages.

Table 4. Regression Analysis (DV = Actual Use)

	Weekly Usage Duration	Weekly Numbers of Post	Weekly Numbers of Feedback
Behavioral Intention (β)	.210	-.104	-.098
R ²	.44	.11	.10
Sig.	.148	.478	.502

β = standardize coefficient

The relationship between behavioral intention and actual use is well-known in technology acceptance literature [22]. Numerous findings from past studies about positive relationship between behavioral intention and actual use were consistent with the basic concept of user acceptance [3], [11], [20], [21]. But in this study, the behavioral intention did not have significant relationship with all three proxies of actual use. The result was similar with findings in previous studies [23], [24], [25]. In the Kanthawongs, Soulisak, and Kanthawongs [25] study, it could be explained since the course was conducted through a traditional lecture classroom environment by incorporating the use of web-based system, students might prefer to rely on an instructor's lecture and

guidance rather than the self-regulated or self-motivated online learning environments.

This study adopted subjective, self-reported usage rather than objective measures. In order to increase actual use, the dependent variable of behavioral intention was a legitimate target of intervention [3]. The proxy of average number of response messages per week did not correlate with the behavioral intention in this study. These numbers also show the level of interaction among students in this study's blog and confirmed the low interaction level among students, with only 47 comments during the research period. Thus, behavioral intention did not have any positive significant influence to actual use. The reason for this may be the low posting volumes on the blog [26], centralized type blog, and passive participation from the students [27]. The solution to this problem was to collaborate with the faculty in creating incentives for students to participate in discussions on the blog [23].

Furthermore, t-test results showed no statistically significant differences between the mean scores of males and females for performance expectancy ($p = .366$), effort expectancy ($p = .341$), and social influence ($p = .913$) for using blog technology in learning activities. Other t-test results also showed no statistically significant differences between the mean scores of inexperienced and experienced students for effort expectancy ($p = .173$) and social influence ($p = .618$) for using blog technology in learning activities.

In this study, both males and females were college students and enjoyed the same level of education as well as similar access to technology. They also had experience in the blogging technology and were most likely familiar with the use of other technology in their daily lives before this study was conducted. Therefore, it may not be surprising to see that both gender and experience did not demonstrate any indicative effect on the blog use, given the students' widespread use of technology.

The blogging period started in end April 2011 and ended in mid-June 2011 for e-business class. A total of 7 posts, 3 pages, 47 comments, and 20 hyperlinks were obtained from the blog statistic page. It also had 4 discussions and 2 assignments posted for participants to complete, with Chapter Summarizing Group generating the most comments for a single post. The results were considered low because only 47 comments and 1,409 views were made in 3 months' period as shown in Table 5. Mohd. Nor, Razak, and Aziz [28] pointed out that it was interesting to note that there was a significantly high number of views than number of replies or postings, indicating that the students read the replies posted by others, possibly evaluated the content and then decided on whether to contribute or not.

Table 5. Blog Statistics

Items	Numbers
Total Posts	7
Total Pages	3
Total Categories	3
Total Comments	47
Discussion 1: e-Business Innovation	9
Assignment 1: Chapter Summarizing Group	20
Discussion 2: e-Supply Chain	7
Assignment 2: e-Business System Presentation	0
Discussion 3: Other EC Models and Application	1
Discussion 4: Web 2.0 and Social Networks	5
Discussion 5: e-Market Place	5
Total Hyperlinks	20
Total Post Tags	2
Total Spam Comments	2
Total Views (April – June 2011)	1,409

VIII. CONCLUSION AND RECOMMENDATIONS

The results of the hypotheses in this study are summarized in Table 6.

Table 6. Hypotheses Results

Study Hypotheses	Result
H1: Performance expectancy is directly correlated with the level of intention to adopt blogs as a learning tool	Accepted
H2: Effort expectancy is directly correlated with the level of intention to adopt blogs as a learning tool	Rejected
H3: Social Influence is directly correlated with the level of intention to adopt blogs as a learning tool	Accepted
H4: Behavioral intention is directly correlated with the level of actual usage of blogs as a learning tool	Rejected

This study applied the UTAUT theoretical framework, a comprehensive theory that integrates eight social psychology and sociology theories, in order to investigate the effects of major factors on behavioral intention and actual use of a blog in learning an e-business's course materials and topic discussions. The results showed that social influence and performance expectancy had significant relationship with behavioral intention, while effort expectancy did not. Behavioral intention and actual use relationship in this study

were not related, due to low interaction level among students in the blog.

In future studies, researchers can investigate the use of blog technology by graduate students with more age or experience variance. With more controllable environment of graduate students, researchers can investigate moderating factors (age and voluntariness of use) that were not examined in this study to verify whether or not those factors are significant within a university setting. Additionally, the quality of responded messages from students can also be analyzed to provide richer results for this study.

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