

# A STUDY OF BLOG USER ACCEPTANCE – USING CHANGHUA COUNTY PUBLIC SCHOOL TEACHERS AS AN EXAMPLE

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## Abstract

In the study of technology acceptance, user behavior intention and usage are used as determinants. This study used Unified Theory of Acceptance and Use of Technology (UTAUT) to explore the acceptance of blog by schools teachers in the upraising technology of Blog. This study examined the teachers' acceptance of blogs through questionnaire survey method. A total of 283 valid questionnaires were obtained from active teacher bloggers. Statistical methods included descriptive statistics, factor analysis, correlation analysis, path analysis. The result showed congruency to the findings in UTAUT. Factors like self-efficacy, performance expectancy, effort expectancy, facilitating conditions and functional capability are determinants of acceptance by teachers. Moderating factors like age, gender and experience played an important role in explaining the influences.

Keywords: UTAUT, blog, user acceptance, functional capability, self-efficacy.

## 1 INTRODUCTION

### 1.1 Background

A recent development and refinement of technology acceptance model by Venkatesh et al. [13] is an innovative advance in IS user acceptance researches, as they examine eight major user acceptance models, and integrate them into a model named Unified Theory of Acceptance and Use of Technology (UTAUT). It is formulated with four core determinants of intentions and usage: performance expectancy, effort expectancy, social influence and facilitating conditions, together with four moderators of key relationship. The model was empirically examined and found to outperform eight other individual models, including TAM [13]. According to UTAUT, examination of the effects of the four moderators has contributed to a better understanding of the complexities of technology acceptance by individuals. Because of its outstandingly strong theoretical premises and explanatory power, this model gives us greater insight into the individual's adoption of an information system, especially the role played by important moderators in the key relationships between individual beliefs and behavioral intentions.

Blogging has taken the world by storm, Pew Internet & American Life Project (PEW) indicated by the end of 2004 blogs had established themselves as a key part of online culture [11]. The "blog" we know originated from the term "web log", it is a term indicating the log one keeps on the web. Various reasons to consider the conveniences of blog included it is more personal and informal than institutional web sites, more accessible to web roamers and searchers than email, more spontaneous than chatrooms and more open to discussion than forums [10]. Boling et al. [2] indicated blog has been adopted in different professional and educational services that involved information sharing and collaboration. A blog allows individuals to create and share personal webpages of text, pictures, graphics, videos, and other multimedia with ease, or just plain communicating [4]. In the article, it was discussed that teachers can use this medium to share information for students, create links to websites for assignments, present their best practices and their lesson plans, show-off the fruits of their students work, post digital pictures, and more. Furthermore, blog can be used as a tool to promote higher order thinking [9].

As UTAUT is a fairly new model, examining this model in different settings such as educational field, and a different technology, such as blog, would seem interesting.

## 1.2 Motivation

By extending UTAUT into different settings, it would broaden the scope and generalization of UTAUT. Hopefully it would serve as the new benchmark of IT acceptance model much like TAM has done over the past 15 years.

The value of using blog in education is a field still waiting to be explored. Changhua County Education Department has established a Changhua County Plog to promote teachers using blog as a completion of the goal in the educational policy to promote IT in education. In recent year Venkatesh et al. [13] have brought forward the 'definitive' model of technology acceptance models, the UTAUT, Unified Theory of Acceptance and Usage of technology. As UTAUT is a fairly new model, examining this model in different settings, different technologies and different user groups would seem necessary.

## 1.3 Purpose of Study

The goals are summarized as follow:

- 1) Ascertain the acceptance of blog as a new technology by teachers in Changhua County.
- 2) Examine the influencing factors affect the acceptance of blog by teachers in Changhua County.
- 3) Examine the moderators that influence the acceptance of blog by teachers in Changhua County.

## 2 METHODOLOGY

### 2.1 Research Model

The goal of this study is to discuss the acceptance of blog by teacher bloggers. The model of UTAUT (Unified Theory of Acceptance and Use of Technology) is applied. Factors such as performance expectancy, effort expectancy, social influence, facilitating conditions, functional capability and self-efficacy are considered to be of determinate in the acceptance of the trendy technology – blog.

The UTAUT model is among the stream of researches focuses on individual acceptance of technology by using 'intention' or 'usage' as a dependent variable. The behavior intention is an indication of use behavior [13]. The model of research is as summarized in the Fig. 1.

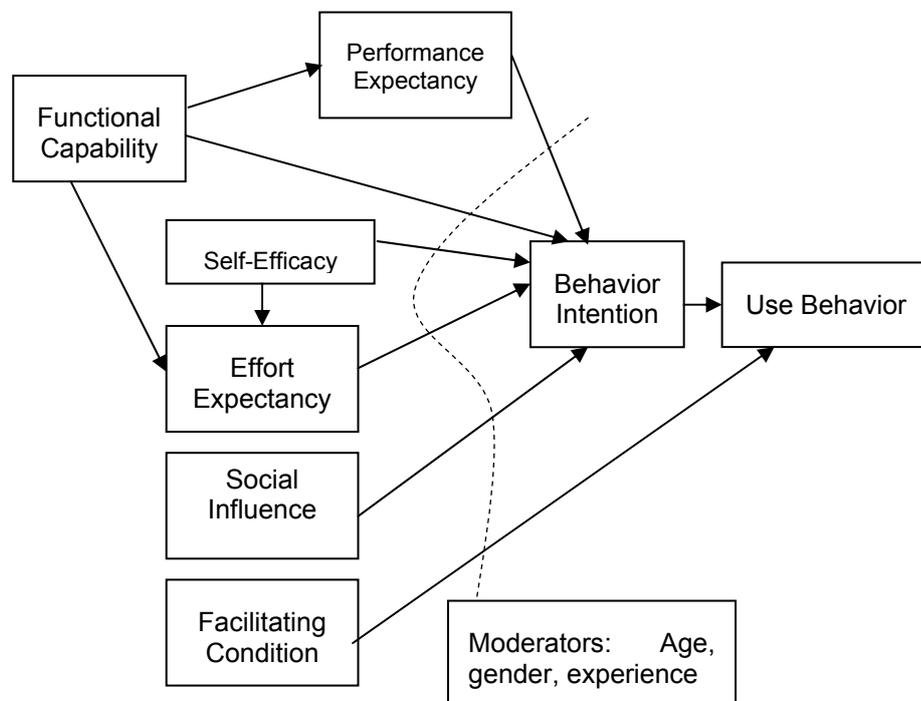


Fig. 1 Research model

## 2.2 Hypotheses

This study is a replica and an extension of UTAUT, the constructs were adapted from the technology acceptance model, behavior intention would affect user behavior [13]. Self-efficacy and functional capability were adopted to re-enforce the explanation. We included self-efficacy in predicting behavior intention and effort expectancy [3]. In other studies [6] the result support functional capability as indicator of behavior intention, perceived ease of use (similar to effort expectancy), perceived usefulness (similar to performance expectancy). (Fig. 2)

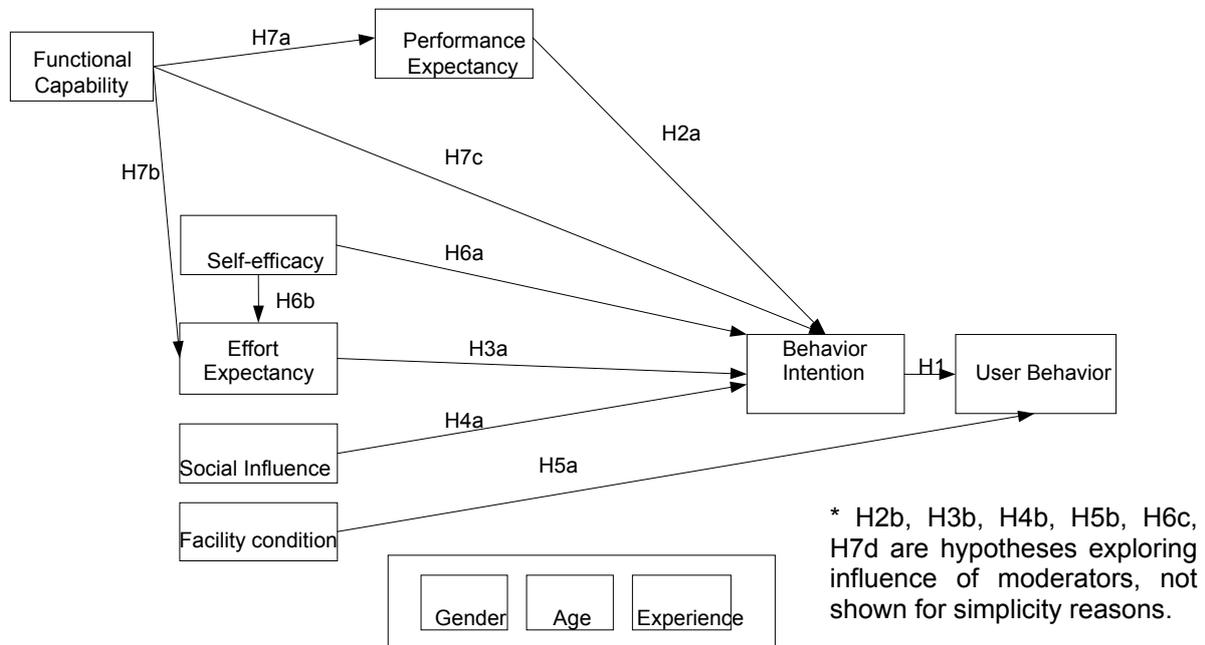


Fig. 2 Summary of Hypotheses

## 2.3 Variables and Operational Definition

1) Independent Variables: Performance Expectancy, Effort Expectancy, Social Influence, Facility Condition, Self-efficacy, Functional Capability, Behavior Intention.

2) Dependent Variables

Use Behavior: In this study it refers to the use of the Blog system. The variable configuration is categorical scale, determining whether or not they would use Blog system.

3) Demographic Variables

This included the details of the teacher bloggers: Gender: Categorical Scale, Age: Ordinal Scale, Experience in Blog: Interval Scale.

## 2.4 Sampling

The method of gathering the samples is purpose sampling, the targets are teacher bloggers in Changhua County.

### 2.4.1 Sampling Criteria

The probability sampling on the Internet is noted as a serious problem facing the availability of a single and comprehensive directory of blogs. However, in this case, we used the Changhua County Plog as the ground of common interest. In the blogosphere, it could be categorized into two categories, namely personal blog and community blog (or collaborative blog) [8]. The former type refers to personal blogs and the latter one usually presents posts on a specific topic created by bloggers of common interest or goals. This research presented the Changhua County Plog as the latter one.

### 2.4.2 Sampling Strategy

The number of blogs on Changhua County Plog consisted of over 500 blogs, noted with the latest creation. However, many of them only consist of establishment and no regular update. A web-based

survey will be carried out targeted at the sample chosen that qualified as an active teacher bloggers of Changhua County Plog.

## **2.5 Pretest**

A total of 65 teachers attended the meeting and with valid return of 58 questionnaires. We use SPSS v.10 for analysis of pretest, the mean of the items ranged from 2.8793 to 4.3966 and skewness less than 1.

Second of all, we explore the correlation of items of measurement and the overall questionnaire. Using the Principal Component Analysis to find the communality of the items, all the scales have the values of above 0.1, it shows all the items are consistent with the overall questionnaire.

We performed factor analysis on the items of external variable to find that the items of measurement have high operability. According to Kaiser [7] that in a factor analysis, the KMO value should be higher than 0.5, Eigenvalue>1. Using Kaiser's Varimax rotation to extract items with factor loading >0.5 to be included in the final questionnaire. The constructs in this research is revised from literature, so we would use principle factor analysis to extract the common factors.

The reliability test is used to test stability of the pretest questionnaires. The Cronbach  $\alpha$  returned from SPSS v10 has an overall value of 0.8571 .

## **2.6 Data analysis and tools**

### *2.6.1 Descriptive Analysis*

By analyze the returned samples, we will observe the demographic distribution, variables of its distribution, data characteristics as in means and standard deviation.

### *2.6.2 Reliability and Validity Analysis*

Next step in analysis is the Goodness-to-fit test and followed by Principal Components Analysis as to examine whether the factors extracted from the final questionnaire matches the factors from our research. Furthermore, Cronbach's  $\alpha$  is used to test the internal reliability for consistency of the factors.

### *2.6.3 Correlation Analysis*

This study uses Pearson product-moment correlation analysis to understand the degree of correlation between the external variables (performance expectancy, effort expectancy, social influence, self-efficacy and functional capability) and the Behavior Intention and Use Intention. The correlation coefficient ( $\gamma$ ) is between -1~1, the positive represents positive correlation, and negative represents negative correlation.

### *2.6.4 Path Analysis*

In this study we will run the path analysis to establish the causal links between the factors. This study used linear regression equation without concerning the moderators first, then with the moderators to understand the acceptance of the blog system by teachers.

### *2.6.5 Compare the Means*

The moderators are tested with T-Test or ANOVA to understand the influence on the outcome of the external variables.

## **3 RESULT**

### **3.1 Descriptive Statistics**

This section presents the basic details of the sample. It includes the distribution of demographics and items of measurements.

#### *3.1.1 Demographic Distribution*

The total of valid returned questionnaires is 283. The details are discussed as follow:

1) Gender

From the sample of the valid returns, 173 male (i.e. 61.1%) and 110 female (i.e. 38.9%); The male sample has higher ratio.

## 2) Age

The age distribution of the sample: 28 people under 25 years old (i.e. 9.9%), 88 people between 26~30 years old (i.e. 31.1%), 138 people is between 31~40 years old (i.e. 48.8%), 28 people is between 41~50 years old (i.e. 9.9%) and there is only 1 person of the age 51 and up (i.e. 0.4%). The majority of the people in our sample are between 26~40 years old (i.e. 79.9%), so it is reasonable to say the majority of the teacher bloggers are young in age, there is a tendency that increase in age decrease in acceptance of this Blog technology.

## 3) Education

The 4 categories in the education describe the education of our teacher bloggers. 4 people graduated with 'Teachers' Diploma' (i.e. 1.4%), 155 people with 'Teachers' Degree' (i.e. 54.8%), 70 teachers with degree from universities (they have a degree other than education and then obtain the teaching diploma) that comes up to 24.7% of the sample and 54 people has a postgraduate degree (i.e. 19.1%). The trend matches the current teacher qualification, the teachers are generally graduated from 'Teachers' college' with a 'Teacher's Degree'.

## 4) Experience

From the sample distribution, it indicated 91 teachers have no experience with Blog system (i.e. 32.2%) and 192 people indicated they have experience with Blog system (i.e. 67.8%). This distribution indicates that as Changhua County promoted Plog, many of the teachers are using some other Blog systems on the Web.

## 5) Use Behavior

This question asks the time the teacher bloggers spent to maintain their blog. 71 people indicated they spent under 1 hour per week in maintaining their blog(i.e. 25.1%); 94 people indicated they spent between 1~2 hours per week in maintaining their blog(i.e. 33.2%); 64 people indicated they spent between 2~3 hours per week in maintaining their blog(i.e. 22.6%); 54 people indicated they spent over 3 hours per week in maintaining their blog(i.e. 19.1%).

### 3.1.2 Distribution of Items of measurement

The scale of measurement is a 7-point Likert Scale, the range is from 1 to 7. The average mean of self-efficacy rank the highest (4.1166) and followed by behavior intention (4.04827). It means the teacher bloggers do felt high self-efficacy in using the Blog system. The users on an average has quite high behavior intention in using the system in the future. Social influence and facilitating condition has the highest standard deviation. It means the blog users has a wider range of opinion in the people influence them and the support gaining from using the system.

## 3.2 Reliability and Validity Analysis

In the questionnaire of blog system used by teacher bloggers consisted of 29 questions. To analyze the content validity we fall on the method of factor analysis. We used Principal Components Analysis to extract the constructs from the questionnaire determining the factors influencing the usage of blog system by teacher bloggers. The rotation method used is Orthogonal Rotation, to create a Rotated Component Matrix. The criteria in factor loading are Kaiser-Guttman Rule, the Eigenvalue is to be greater than 1; factor loading value to be greater than 0.4 [5, 12]. First, from the goodness-to-fit measure, KMO=0.879 and Bartlett's Test of Sphericity is significant ( $P<.001$ ). The Rotated Component Matrix showed 6 factors extracted. The factors correspond to the factors proposed. The total variance explained is 74.754%. For the validity analysis, we also included checking Cronbach  $\alpha$  coefficient for consistency.

## 3.3 Correlation analysis

The result showed a positive correlation between behavior intention and actual usage. The result shows the factors are positively correlated. The external factors ( performance expectancy, effort expectancy, social influence, facilitating condition, self-efficacy and functional capability ) are positively correlated to Behavior Intention, hence if the teacher blogger felt he or she could gain benefit from using the system, then he or she would have higher behavior intention in using the system.

### 3.4 Path Analysis

The overall result is shown in Fig. 3. The paths between the variables are significant except for functional capability and performance expectancy.

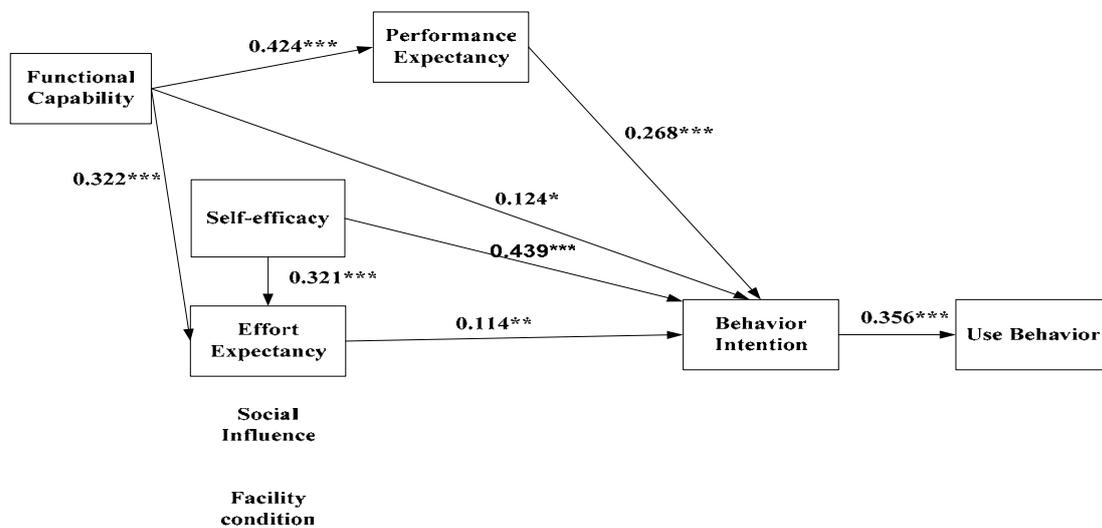


Fig. 3 Showing Relationships in Path Diagram (Without moderators)

### 3.5 Mean test

#### 3.5.1 The Influence of Gender

The distribution of gender in our sample is 61.1% male and 38.9% female. T-Test result of the influence of gender on the external variables, only self-efficacy showed significant difference ( $p < 0.05$ ). Statistically, the result only proved the significant difference in gender to the external variables, path analysis should be accompanied to verify the influence of gender on the behavior intention and use behavior. The result indicated significant coefficient between behavior intention and use behavior moderated by gender. Performance expectancy, self-efficacy and facilitating condition are important in both gender toward behavior intention and usage. Effort expectancy and functional capability are considered important to behavior intention in female but not male.

#### 3.5.2 The Influence of Age

According to our sample distribution of age, we divided the age groups into: (1) Under 25; (2) 26-30; (3) 31-40; (4) 41 and up. Result shows ANOVA of the result of the influence of age on the external variables, only social influence ( $F = 6.316$ ,  $p < 0.05$ ) and performance expectancy ( $F = 3.006$ ,  $p < 0.05$ ) showed significant difference.

Regression is used to test the influence of age on the variables, and the result shown different age groups had a slight different view in factors influence their behavior intention and usage. Teachers under 40 years old focused on performance expectancy (benefits to the teachers) and self-efficacy as determinates for intention on using Blog. For teacher over 40 years old, effort expectancy, or the easiness of using the system would influence their behavior. For the age group of between 31~40 years, there were various factors influence their intention, but with self-efficacy the highest.

#### 3.5.3 The Influence of experience

In this study, we categorize experience into two groups: (1) novice and (2) experienced. From the distribution of sample, 32.2% of the teachers indicated no previous experience and 67.8% indicated they do. The result also showed that both experienced and novice teachers felt the blog must be useful to them and self-efficacy is an important factor influencing their behavior. The teachers felt support from school is an influencing factor in usage. The easiness in using the system influence novice teachers,

while the system functions influence the more experienced teachers. Fig. 4 shows the relationship of Path Analysis.

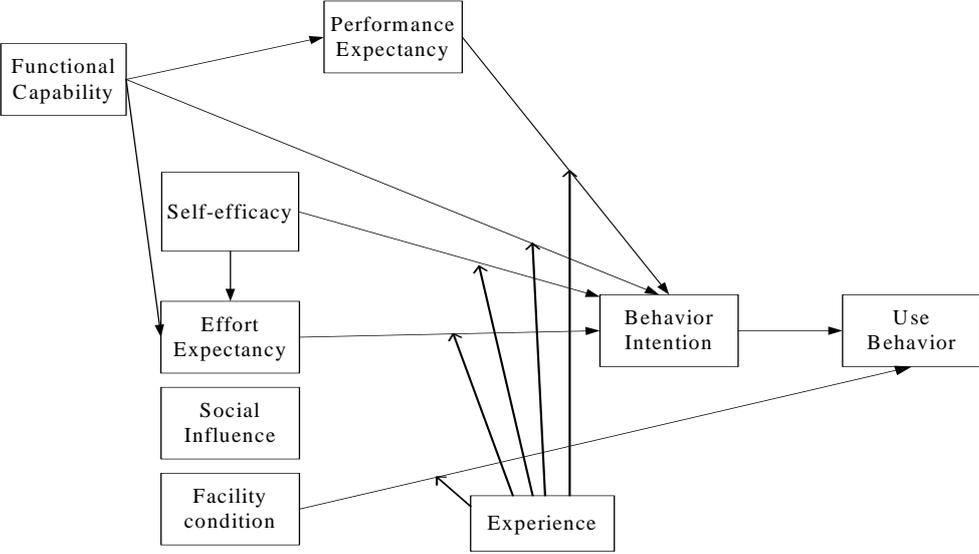


Fig. 4 Path Analysis of Experience moderating the external variables and Behavior Intention and Usage

In UTAUT the moderating variables were found to significantly influence the intention and usage behavior [13]. The result from this section has shown similar finding.

**3.6 Result Review**

From the results of the analysis carried out, the confirmations of the hypotheses are shown in the table 1.

Table 1 Summary of the confirmation of hypotheses.

Hypotheses	Result
H1: Behavior intention(BI) will have a significant positive influence on usage.	Confirmed
H2a: Positive influence of performance expectancy on BI.	Confirmed
H2b: The influence of performance expectancy on BI will be moderated by personal traits.	Confirmed
H3a: Positive influence of effort expectancy on behavior intention.	Confirmed
H3b: The influence of effort expectancy on behavior intention will be moderated by personal traits.	Confirmed
H4a: Positive influence of social influence on behavioral intention.	Not Confirmed
H4b: Positive influence of social influence on behavioral intention and moderated by personal traits.	Partially Confirmed
H5a: Facilitating conditions will have a significant influence on Use Behavior.	Not Confirmed
H5b: Facilitating conditions will have a significant influence on Use	Confirmed

Behavior and it is moderated by personal traits.	
H6a: Self-efficacy will have a significant effect on behavioral intention.	Confirmed
H6b: Self-efficacy will have a significant effect on effort expectancy.	Confirmed
H6c: Self-efficacy will have a significant effect on behavior intention and moderated by personal traits.	Confirmed
H7a: Functional capability will have an effect on performance expectancy.	Confirmed
H7b: Functional capability will have an effect on effort expectancy.	Confirmed
H7c: Functional capability will have an effect on behavior intention.	Confirmed
H7d: Functional capability will have a significant effect on use behavior and moderated by personal traits.	Confirmed

## 4 DISCUSSION

### 4.1 Discussion of Result

The acceptance of Changhua County Blog included behavior intention and use behavior. Out of the 283 samples, behavior intention has a mean of 12.1 ( $\sigma=2.24$ ); Use behavior has a mean of 2.4 ( $\sigma=1.06$ ). This indicated the teacher bloggers has a high intensity on behavior intention and use behavior. Furthermore, the correlation between BI and Use has shown a significant level but not relatively high, the reason may due to the facts that in this study the technology acceptance model is tested on different technology, different user groups .The result shown a tendency of teachers' using the blog system.

In the factor analysis, the statistics shown that on the evaluation of the constructs, it corresponds to the factors in the UTAUT model and related references, the factors included: performance expectancy, effort expectancy, social influence, facilitating condition, self-efficacy and functional capability. However, in the path analysis, only performance expectancy, effort expectancy, self-efficacy and functional capability influence the teachers' intention in using the system. Social influence did not show significant influence on behavior intention with or without the moderator, this is partially comply with the result finding in the UTAUT model [13]. In this study social influence is only significant with age as a moderator.

Among the factors of influence, self-efficacy shown the strongest influence on behavior intention than others. This corresponds to other studies on technology acceptance, where self-efficacy is deemed to be an important factor [1, 3, 6]. The moderators included in the study of age, gender and experience as adapted from Venkatesh et al. [13], have all shown significant influence on the behavior intention of teachers in using the blog system. In the UTAUT model, the effects of the moderators contributed to a better understanding of the complexity of technology acceptance, this is further validated in our study.

The overall result indicated various factors such as self-efficacy (or more specifically, computer self-efficacy), performance expectancy, effort expectancy, facilitating condition, functional capability will influence the acceptance of blog by teachers in Changhua County.

Even some of the factors did not show influence on acceptance of blog system, it only means the teachers have different level of concern toward the system. Social influence and facilitating condition did not have significant influence on acceptance, they are related to personal judgment and external environment conditions. Firstly, teachers are not bound to use the technology if they do not want to. With the hierarchical status of the educational system, supervisors may not have the influence on teachers to use Blog. Facilitating condition may not shown as an influencing factor in acceptance, but when considered with moderators, they are all significant.

## 4.2 Future Work

In this study, about two third of the teachers shown experiences in other blog related systems, further study could help to explain the function related features preferred in the system, and generate future improvement.

TAM with the concise external variables has been validated across different systems. The model of UTAUT has more explicit details on the understanding of acceptance in information technology. This is still a new model waiting to be tested. Further trial on different technology and different user group should be carried out to further validate the model.

To further confirm the finding of this study, larger scale of samples could be taken, as to validate the result of the finding in this study.

## 4.3 Conclusion

Many of the results in this study shown congruency to the technology acceptance model. Blogging tools are a now-day favorites for everyone with Internet access. It is a simple tool with fanciful functions embedded in just a few clicks away. In the world of competitive advantage, teachers are among the group who need to prepare themselves for any future evaluation on their teaching performance. What better tool than blog to hold their thoughts of instruction, share their experience and knowledge and a channel of communication to anywhere across the virtual globe?

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