Factors Affecting Business Students Using Online Electronic Platforms as Their Places for Academic Discussion

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ABSTRACT

The role of information and communication technology (ICT) is increasingly important in our Business education in universities. Students are using mobile technologies in their studies. The Unified theory of Acceptance and Use of Technology (UTAUT) is validated partially. Performance Expectancy, Effort Expectancy and Social Influence are associated with the behavioral intention using electronic platforms in student’s academic discussion. Facilitating Conditions is not associated with Use Behavior.

Keywords: ICT; business education
1. Introduction

Due to the speed development of World Wide Web, students use electronic platform is one of the major ways in their learning (Capace and Campisi, 2013). A lot of empirical studies show that using e-learning technology may enhance student learning effectiveness (Huang et al. 2007). Bouhnik and Marcus (2006) pointed out that there are several advantages on e-learning: students can decide when will be learned, free to ask questions and assess the material at own time.

In 2003, there was an outbreak of SARS (Severe Acute Respiratory Syndrome) in Hong Kong. During April to July 2003, there was a suspension of the classes in schools and universities. Some of the universities using email to deliver the messages and course material. The event triggered the need of establishment some sort of electronic platforms in all the universities. At that particular period, students received notes and assignment and they were asked to complete those assignments at home. Electronic platform becomes the most important medium at that particular period. Nowadays, all tertiary educational institutions are using different type of electronic platforms including Blackboard, WebCT or Moodle.

Capper (2001) mentioned that many benefits can be obtained through e-learning. Any time and any place are obvious candidates as illustrate in the last paragraph. He pointed out that electronic messages create a new way for students working together (Capper, 2001). This study aims at locating factors affecting students using online electronic platform as their place for academic discussion. Other than “official” electronic platform like Blackboard or Moodle, students are more likely to use other electronic platforms including Facebook and Whatsapp. This is an empirical study on university students what factors affecting them using such kind of platforms in Hong Kong.
2. Literature Review and theoretical framework

Davis et al. (1989) proposed the technology acceptance model (Figure 1), which was adapted from the theory of reasoned action (Fishbein and Ajzen, 1975). There are two important independent variables: perceived usefulness and perceived ease of use. Perceived usefulness was defined as “the degree to which a person believes that using a particular system would enhance his or her performance.” (Davis, 1989, p. 320) Perceived ease of use was defined as “the degree to which a person believes that using a particular system would be free of effort.” (Davis, 1989, p.320) The dependent variables are attitude toward using the system and behavioral intention, which is adapted from Fishbein and Ajzen (1975).

Figure 1 The Technology Acceptance Model (TAM)

TAM model appears to be able to account for 40% to 50% of user acceptance. (Venkatesh and Davis, 2000) The strength of the model is simple in nature. The weakness is that it only able account for less than half of user acceptance. Chau (1996) modified the TAM model using perceived near-team usefulness and long-term usefulness. He found that perceived near-team
usefulness had the most significant influence on the behavioral intention and perceived long-term usefulness had a lesser impact. Lin (2011) proposed negative critical incidents through quality attributes cumulative satisfaction and attitudes are the main variables to determine the users’ intention to continue using the e-learning. He added that the user’s experience of the e-learning service acts as a moderating variable. Negative critical incidents are “users’ encounters with services that do not proceed normally and create friction, irritation and dissatisfaction.” Quality attributes cumulative satisfaction is “defined as a user’s affective state based on an overall evaluation of quality attributes” (Lin, 2011, 516).

There was a mixed result regarding perceived ease of use. The perceived ease of use was found to be not a significant indicator on intention of using the e-learning platform (Lee et al., 2005; Raaij and Schepers, 2008). In contrast, opposite results were obtained (Ngai et al., 2007; Liu et al., 2009). They found that perceived ease of use was strongly associated with attitude in using e-learning system. Islam (2013) suggested perceived usefulness and perceived ease of use affecting how an e-learning system is used. He stressed on the use outcomes. They are learning assistance, community building and academic performance.

Venkatesh and Davis (2000) proposed a theoretical extension of the Technology Acceptance Model (TAM). The new model is called TAM2. It includes additional construct social influence processes (subjective norm, voluntariness and image) and cognitive instrumental processes (job relevance, output quality, and result demonstrability). Subjective norm is defined as “person’s perception that most people who are important to him think he should or should not perform the behavior in question” (Fishbein and Ajzen, 1975, 302) Venkatesh and Davis (2000) argued that people may follow the others’ idea even though he or she does not have favorable toward the behavior. TAM2 theorized that the direct effect of subjective norm
on intention will occur under mandatory setting but not on the voluntary setting. Voluntariness is defined as “the extent to which potential adopters perceive the adoption decision to be non-mandatory” (Venkatesh and Davis, 2000, 188). Voluntariness acts as a moderating variable in the TAM2 model.

Venkatesh and Davis (2000) agreed that people respond to social influences in order to form a good image among their peers. Image is defined as “the degree to which use of an innovation is perceived to enhance one’s status in one’s social system” (Venkatesh and Davis, 2000, 189). TAM2 indicated that the direct effect of subjective norm on behavior intention will be strong before implementation but will decrease over time as increasing experience with a system. Perceived usefulness is affected by job relevance, output quality and result demonstrability. Job relevance is defined as “an individual’s perception regarding the degree to which the target system is applicable to his or her job” (Venkatesh and Davis, 2000, 191). It is quite natural that the more easy the system to apply to the job, the more useful in user’s perception. Output quality is what tasks a system is able to complete. At first sight, the meaning of output quality is quite similar to job relevance. But output quality is going to take the profitability test rather than compatibility test to make a delivery. Result demonstrability is defined as “tangibility of the results of using the innovation” (Venkatesh and Davis, 2000, 192). TAM2 model keep “perceived ease of use” from TAM. Longitudinal field studies were employed to test the model. It was found that the basic TAM relationships (intention-usage; usefulness-intention; ease of use-intention; ease of use-usefulness) were all supported, with full mediation by intention and no moderation by voluntariness or experience. The subjective norm-intention relationship was moderated by both experience and voluntariness. The subjective norm-usefulness relationship was moderated by experience but not for image-usefulness relationship. The interaction term of job relevance and output quality is
significant. TMA2 explained up to 60% of the variance on usage intentions. The new model made a contribution that subjective norm with usage intention relationship and subjective norm with perceived usefulness relationship have direct effect on mandatory but not voluntary system (Venkatesh and Davis, 2000).

Venkatesh (2000) suggested further determinants of perceived ease of use. Perceived ease of use is defined as “the extent to which a person believes that using a technology will be free of effort” (Venkatesh, 2000, 344). Before direct experience with target system, people are expected to anchor their system specific perceived ease of use of a new system. With increasing experience with the system, people are expected to adjust their system specific perceived ease of use to reflect their interaction with the system. That is to say, in the early stage, individual differences based on previous experience like self-efficacy become main determinant of perceived ease of use. As user obtains experience with the system, it will adjust to reflect unique attributes of their interaction with the system. In common sense, it is quite logical (Venkatesh, 2000).

The proposed model with new constructs: computer self-efficacy, facilitating conditions (perceptions of external control), computer anxiety, computer playfulness, perceived enjoyment and objective usability. Internal control called as computer self-efficacy. External control relates to the environment. It includes availability of support staff, which helping users to deal with the system (Venkatesh, 2000).

“Computer self-efficacy refers to individuals’ control beliefs regarding his or her personal ability to use a system; perceptions of external control are related to individuals’ control beliefs regarding the availability of organizational resources and support structure to facilitate
the use of a system; computer playfulness is the intrinsic motivation related with any new system.” Two system characteristics, perceived enjoyment and objective usability, were proposed after one get experience with the new system (Venkatesh and Bela, 2008, 278).

Venkastesh (2000) proposed the role of intrinsic motivation which TAM excluded. Computer playfulness is defined as “the degree of cognitive spontaneity in microcomputer interaction” (Venkastesh, 2000, 348). People who are more enjoyed the playfulness of computer are more easy to the use of system. Computer anxiety is defined as “an individual’s apprehension when he is faced with the possibility of using computers” (Venkastesh, 2000, 349). Similar to the computer self-efficacy and playfulness, computer anxiety relates to the user perception on the computer use. In general, more anxiety would lead to lower perceived ease of use (Venkastesh, 2000). It could be the case twenty years before but it would rather difficult claimed today as people are used to operate with technology.

Objective usability is a construct that “allows for a comparison of system based on the actual level of effort required to complete specific tasks” (Venkastesh, 2000, 351). One would think that the system is easy to use based on the extent to which the system is easy to use from an objective standpoint (Venkastesh, 2000). This is the first adjustment based on users’ experience. The second one is perceived enjoyment. It is defined as “the extent to which the activity of using a specific system is perceived to be enjoyable in its own right” (Venkastesh, 2000, 351). Venkastesh (2000) pointed out that with increasing interaction with system, user usually become bored and less interested in the system. Thus, less perceived enjoyment is expected (Venkastesh, 2000).

Venkastesh (2000) conducted three longitudinal studies to test the factors affecting perceived ease of use. By looking at the pooled data, perceived ease of use and perceived usefulness
explain around 35% of the variance in intention. Perceived ease of use was tested to be a mediator to intention. With increasing experience, adjustments were found to be played more active role in explaining perceived ease of use, up to 60% (Venkatesh, 2000).

Venkatesh et al. (2003) proposed a Unified theory of Acceptance and Use of Technology (UTAUT) (Figure 2). Four latent variables are identified affecting behavioral intention: Performance Expectancy, Effort Expectancy, Social Influence and Facilitating Conditions. Gender, age, experience and voluntariness of use are moderating variables (Fig 2). Facilitating conditions are defined as “the degree to which an individual believes that an organizational and technical infrastructure exists to support use of the system” (Venkatesh et al., 2003, 453). The advantage of the theory is it explains up to 70% of the variance in intention. Also, the model tries to capture factors related to the prediction of intention to use a technology and technology use in organizational contexts. The model was validated partially by Wang and Shih (2009) on people usage of information kiosks.

**Figure 2 Unified Theory of Acceptance and Use of Technology (UTAUT)**
My propose research framework is based on UTAUT model. According to the UTAUT, facilitating behavior and behavioral intention are hypothesized to be independent variables affecting user behavior. Performance expectancy, effort expectancy, social influence, information quality, system quality and facilitating behavior are proposed to be independent variables affecting behavioral intention in the context of e-learning platform.

Thus, the research questions (RQ) are listed as follows for academic discussion among teacher and students:

RQ1: Is there a positive association between Performance expectancy and behavioral intention on using e-learning platform?

RQ2: Is there a positive association between Effort expectancy and behavioral intention on using e-learning platform?

RQ3: Is there a positive association between Social influence and behavioral intention on using e-learning platform?

RQ4: Is there a positive association between Facilitating conditions and use behavior intention on using e-learning platform?

RQ5: Is there a positive association between behavioral intention and user behavior on using e-learning platform?

The corresponding research null hypotheses are shown as follows:

H1: Performance expectancy has a positive association on behavioral intention to use e-learning platform.

H2: Effort expectancy has a positive association on behavioral intention to use e-learning
platform.

H3: Social influence has a positive association on behavioral intention to use e-learning platform.

H4: Facilitating conditions has a positive association on user behavior to use e-learning platform.

H5: Behavioral intention has a positive association on user behavior to use e-learning platform.

3. Methodology

A two-part research design is used. The first phase consists of a pilot study and the second phase is a survey-based empirical study. A questionnaire is used because the target data is factual and readily acquired by most standardized questionnaires. In the positivist approach, the use of questionnaires is widely adopted (Fullerton and Taylor, 2002). The purpose of the pilot study is to check the reliability of the questionnaire and anticipate any problems that may occur in the full-scale survey. Some rephrasing of the questions is expected. The Cronbach’s coefficient alpha of some constructs is lowered by reducing the number of items through the pilot study. A Cronbach alpha between 0.7 and 0.9 is considered to be the criteria for internal consistency of the scales (Hong et al., 2004). Questionnaires are sent to experts in education field, who study each item against the proposed construct to ensure face and content validity (Cavana et al., 2000). The sample profile in the pilot study is an approximation of the target population.

The items performance expectancy, effort expectancy, social influence, facilitating conditions, user behavior and behavior intention are adapted from Venkatesh et al. (2003). Those items were modified to make them to the context of e-learning platform (See appendix for all the
items).

Researcher conducted a survey to test our hypotheses. Data used to test the proposed research model was collected using a cluster sampling method. First, all the classes are identified. Second, select certain classes at random. Third, all the students in different programmes/classes were asked to join the survey. They are mostly business students. Sample size is 113.

According to Hair et al. (2014), covariance-based SEM minimizes the difference between the sample covariance and that predicted by theoretical model. The other method is partial least square (PLS), which consists of a structural part reflecting the relationships between the latent variables and a measurement part reflecting how the latent variables and their indicators are related.

PLS is more robust with less identification problems, can be used in small and large samples. The PLS results of all the bootstrap samples provide the standard error for each path model coefficient. Student t test can be used to estimate the significant of path model relationship with this information (Hair et al., 2011; Peng and Lai, 2012).

Hair et al. (2012) pointed out that for reflective outer model evaluation, several criteria must be reviewed. They are indicator reliability, internal consistency reliability and convergent validity. Standardized indicator loading should be larger or equal to 0.70 although in exploratory studies, loadings of 0.40 are acceptable. Composite reliability should be larger than 0.70 and average variance extracted (AVE) should be greater than 0.50 (Hair et al., 2012).

At this stage, researcher propose partial least squares (PLS) to test the research model as the main purpose of the study is to test the predictive power of the independent variables.
In addition, sample size could be more flexible in PLS. In SEM-CB, the sample size could be twenty times number of parameters estimated (Bentler and Chou, 1987). In this paper, the sample size would be 440 (22 x 20). On the other hand, the minimum requirement for PLS would be ten times the most complex relationship in the research model. There are certain conditions researcher has to meet including strong effect size and high reliability of measurement items (Marcoulides and Saunders, 2006). The most complex relationship in this study is that there are three independent variables affecting behavioral intention. Thus, the minimum number is 30.

In order to improve the precision in the parameter estimation for reflective construct in PLS, one way is to increase number of indicator for a particular construct (Peng and Lai, 2012). But there is a tradeoff that it makes the questionnaire longer and respondents are unwilling to join the survey.

According to Peng and Lai (2012), model complexity has a direct impact on sample size requirement in SEM-CB but not in PLS necessarily. Tests on moderation and mediation can increase the sample size requirement potentially. PLS can afford the researcher estimates more complicated model provided that the basic sample size requirement is fulfilled (Peng and Lai, 2012).

PLS requires data distribution assumptions of the ordinary least squares regression concerning data properties and does not require a multivariate normal data distribution. In contrast, SEM-CB does require a multivariate normal data distribution. Violate this assumption will lead to underestimation on standard errors and inflated goodness of fit statistics (Peng and Lai, 2012).
PLS makes use of bootstrapping procedure to estimate standard errors. The main purpose of bootstrapping is to reduce the effect of random sampling errors (Peng and Lai, 2012). The default setting for the most popular PLS software, SmartPLS, is 500. With increasing the computing power, the time of computation is just a few second, compared to a few minutes a decade ago.

There are limitations of the research methodology and design in the study. First of all, although the data set is a good representative of university students in Hong Kong, it should not be regarded as a generalization for all Hong Kong university students as the sample is a non-probability sample. Secondly, the results cannot be taken as further generalization to the other types of group because of different group and cultural characteristics. Thirdly, this study makes use of cross-sectional data due to time constraints. However, it has the problem of the causal relationship being involved in the research. Longitudinal data are more desirable for testing a structural causal model. Lastly, individual answers on the questionnaire provided are subjective and therefore inherently biased, which must be taken into account when considering the final evaluation.

4. Data Analysis and Discussion

Almost 60% respondents are female that is roughly the same percentage in overall sex distribution in tertiary education institutions. Almost 80% of respondents studied the programmes related to commercial and social science and about 20% of respondent studied design programme. Around 70% of respondents studied full time programme and 30% of respondents studied part-time programme. Nearly 90% of students use Whatsapp and Facebook when they are doing group discussion with other classmates.
Descriptive statistics of constructs and correlation between constructs are found in Tables 1 and 2. Those constructs roughly follow normal distribution.

### Table 1  Descriptive Statistics

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>Skew</th>
<th>Kurtosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>PE</td>
<td>5.233</td>
<td>0.715</td>
<td>-0.23</td>
<td>0.092</td>
</tr>
<tr>
<td>EE</td>
<td>5.573</td>
<td>0.709</td>
<td>-0.393</td>
<td>0.115</td>
</tr>
<tr>
<td>IS</td>
<td>4.983</td>
<td>0.773</td>
<td>0.133</td>
<td>0.074</td>
</tr>
<tr>
<td>FC</td>
<td>5.390</td>
<td>0.786</td>
<td>0.139</td>
<td>-0.492</td>
</tr>
<tr>
<td>IB</td>
<td>5.559</td>
<td>0.891</td>
<td>-0.334</td>
<td>-0.310</td>
</tr>
<tr>
<td>UB</td>
<td>5.398</td>
<td>0.930</td>
<td>-0.323</td>
<td>-0.588</td>
</tr>
</tbody>
</table>

### Table 2  Correlation Matrix between constructs

<table>
<thead>
<tr>
<th></th>
<th>PE</th>
<th>EE</th>
<th>IS</th>
<th>FC</th>
<th>IB</th>
<th>UB</th>
</tr>
</thead>
<tbody>
<tr>
<td>PE</td>
<td>1</td>
<td>.728</td>
<td>.512</td>
<td>.483</td>
<td>.640</td>
<td>.313</td>
</tr>
<tr>
<td>EE</td>
<td>.728</td>
<td>1</td>
<td>.469</td>
<td>.648</td>
<td>.625</td>
<td>.505</td>
</tr>
<tr>
<td>IS</td>
<td>.512</td>
<td>.469</td>
<td>1</td>
<td>.478</td>
<td>.573</td>
<td>.281</td>
</tr>
<tr>
<td>FC</td>
<td>.483</td>
<td>.648</td>
<td>.478</td>
<td>1</td>
<td>.597</td>
<td>.330</td>
</tr>
<tr>
<td>IB</td>
<td>.640</td>
<td>.625</td>
<td>.573</td>
<td>.597</td>
<td>1</td>
<td>.427</td>
</tr>
<tr>
<td>UB</td>
<td>.313</td>
<td>.505</td>
<td>.281</td>
<td>.330</td>
<td>.427</td>
<td>1</td>
</tr>
</tbody>
</table>

Thus, from the Table 3, the impacts of Social Influence, Effort Expectancy and Performance Expectancy are significant on behavioral intention to use e-learning platform. Also, the impact of Behavioral Intention is significant on use behavior. It is found that Facilitating Conditions is not significant on Behavioral Intention.
### Table 3  PLS analysis

<table>
<thead>
<tr>
<th>Path</th>
<th>Mean</th>
<th>Standard error</th>
<th>T value</th>
<th>Significance (p value)</th>
</tr>
</thead>
<tbody>
<tr>
<td>EE&gt;&gt;IB</td>
<td>0.286</td>
<td>0.124</td>
<td>2.314</td>
<td>0.021*</td>
</tr>
<tr>
<td>FC&gt;&gt;UB</td>
<td>0.209</td>
<td>0.127</td>
<td>1.642</td>
<td>0.101</td>
</tr>
<tr>
<td>IB&gt;&gt;UB</td>
<td>0.358</td>
<td>0.141</td>
<td>2.532</td>
<td>0.012*</td>
</tr>
<tr>
<td>IS&gt;&gt;IB</td>
<td>0.296</td>
<td>0.098</td>
<td>3.005</td>
<td>0.003**</td>
</tr>
<tr>
<td>PE&gt;&gt;IB</td>
<td>0.29</td>
<td>0.119</td>
<td>2.438</td>
<td>0.015*</td>
</tr>
</tbody>
</table>

*P < 0.05, **P < 0.01

Thus, all the hypotheses (H1, H2, H3, and H5) except hypothesis four are supported for the combined data. The PLS findings are presented as Figure 3.

**Figure 3** PLS findings
The Unified theory of Acceptance and Use of Technology (UTAUT) is validated partially though independent variable “Facilitating Conditions” is rejected from the model. It is probably because almost all students are using smartphone and Whatsapp. It is a basic assumption that they already possess the resources and knowledge to use it. Whatsapp is not compatible with university platforms like Blackboard and Moodle. No specific people take care about the system as well. Those things make “Facilitating Conditions” not significant on its association with Use behavior.

As expected, “Social Influence” is the most prominent independent variable. Students are easily influenced by their peers. One would be likely to use the same discussion tool like Facebook when the other group members are using in their group project assignment. They can have instant feedback from their group members so “Performance Expectancy” can have significant relationship with behavioral intention when using e-platforms. Facebook and Whatsapp are extremely simple and easy to use so “Effort Expectancy” would be the other independent variable as well.

The model explains 53.9% of the variance in behavioral intention and 26.2% of the variance in Use behavior. A bit low percentage in behavioral intention compared with Venkatesh (2003) (70%). Anyhow, the explained percentage of the variance in behavioral intention is close to the recent study by Wang and Shih (2009)’s 64.5%. 26.2% of the variance in Use behavior is higher than Wang and Shih (2009)’s result (14.5%). It is due to Wang and Shih’s study purpose is on the usage of information kiosks probably.
5. Conclusion

The study investigates how different factors affecting business studies using electronic platform. Facebook and Whatsapp are mostly used by students when they communicate with each other for their studies.

This paper makes several important contributions. First, the results support the generalizability of the UTAUT to those technologies partially. Second, the empirically validated model provides a useful framework for university to develop and implement better user-accepted “formal” university electronic platform. For example, the synchronization between Facebook and Whatsapp with university electronic platform would be one of the issues need to be addressed. Also, discussion forum function needs to be personalized in order to attract more users.

There are some unexplored research areas. Different factors may be considered when students interact with their teachers. Is there any factor other than Facilitating Conditions affecting Use behavior? Gender, age and mode of study are probably a moderating factor for the model. Further research can be done on comparing different electronic platforms as well.
6. References


Appendix

Original survey items used in the study:

Performance expectancy
PE1: I would find e-learning platform useful in my information access and processing
PE2: Using e-learning platform enables me to finish tasks of information access and processing more quickly
PE3: Using e-learning platform increases my productivity of information access and processing
PE4: If I use e-learning platform, I would increase my ability to get timely information.

Effort expectancy
EE1: My interaction with e-learning platform is clear and understandable
EE2: It would be easy for me to become skillful at using e-learning platform
EE3: I would find e-learning platform easy to use
EE4: Learning to operate e-learning platform is easy for me.

Social influence
SI1: People who influence my behavior will think that I should use e-learning platform
SI2: People who are important to me will think that I should use e-learning platform
SI3: The seniors in my college have been helpful in the use of e-learning platform
SI4: In general, my college has supported the use of e-learning platform

Facilitating conditions
FC1: I have the resources necessary to use e-learning platform
FC2: I have the knowledge necessary to use e-learning platform
FC3: e-learning platform is compatible with other systems I use
FC4: A specific person is available for assistance with dealing e-learning platform difficulties

Behavioral intention
BI1: I intend to use e-learning platform in the future
BI2: I predict I would use e-learning platform in the future
BI3: I plan to use e-learning platform in the future

User Behavior
UB1: How many times do you use e-learning platform during a week?
UB2: How many minutes do you use e-learning platform every week?
UB3: How frequently do you use e-learning platform?