Determinants of Students' Internet Usage for Academic Purposes

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The aim of this study is to investigate the factors that influence students' use of the Internet for academic purposes. This study applies underlying theory of planned behavior (TPB). Based on the theory, the original variables of attitudes, subjective norms, perceived behavioral control, and intention were hypothesized to determine Internet usage. A survey involving 422 students in various public universities in Malaysia was carried out. Results of multiple regression indicated that attitude, subjective norms, and perceived behavioral control are statistically significant in influencing intention to use the Internet for learning purposes. Meanwhile, intention was found to significantly influence Internet usage for academic purpose. Students' intention to use the Internet for academic purposes could be predicted from their attitude, subjective norms, and perceived behavioral control at 41% level. Meanwhile, intention significantly influences Internet usage at 45% level. Implications and recommendations for practice and future work, and limitations of the study are also discussed.

Field of Research: Attitudes, Subjective Norms, Perceived Behavioral Control, Intention, Behavior

1.0 Introduction

In the past few decades, the Internet technology has shaped and transformed the way people live, both at the personal and professional levels. At the personal level, the Internet is now used as an important means of communication. It is common nowadays for people to use the Internet to make their purchases online, do online banking, or make payments for their bills. At the professional level, the Internet is used to communicate with clients and to share knowledge across organizations, to name a few. Because the Internet has been able to open up to various possibilities unthinkable then, it is no longer a jargon. In fact, many people now use the Internet to update themselves with varieties of information. As such, the Internet is called a gateway of information.

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The Internet also affects the way people learn especially in higher learning institutions (Edmunds, Thorpe, and Conole, 2010). Indeed, to stay relevant, it is imperative for universities to stay abreast with the current technological development in teaching and learning. To enhance the teaching and learning experiences further, many universities have also installed the necessary infrastructure around their campuses. For example, the installation of wireless hotspots have enabled students to access the Internet easily and readily at anytime and anywhere at their convenience. This means that they can use the Internet to search for information, interact with lecturers, access library materials and download notes from their lecturers' websites. Learning therefore is no longer restricted to classroom interactions and teaching, but it is extended beyond the normal class schedule.

Whilst the Internet can be beneficial for students as it allows them to obtain relevant academic information, it also offers other possibilities that may be harmful to their academic experience. Indeed, previous studies that focused on the general pattern of the Internet usage among students in tertiary education found that students tend to use the Internet less for academic purposes. For example, a study by Pew Internet and American Life (as cited in Asfaw & Bo, 2003) found that college students use the Internet more for social activities like communicating with friends than for academic-related tasks. A study by Chan and Fang (2007) to investigate the use of Internet among young people in Hong Kong found that the Internet is used for different purposes such as for making friends, shopping, listening to music, having fun, doing homework, and finding information for further education. Hinson and Amidu (2006) investigated the impact of the Internet on the use of up-to-date information by final year students in Ghana by looking at the purposes of Internet usage such as for educational use, fun and entertainment, and communication with others. At the local front, Noor Ismawati (2003) investigated computer usage and perceptions among accounting students in Universiti Malaya. This study also sought information on the usage of Internet for communication, online purchasing, doing assignments, personal activities and searching academic resources. She also found that students use Internet highly for social and entertainment purposes compared to academic activities.

Based on the descriptive scenario above, concerns are raised on why students use the Internet less for academic activities and more for social purposes. Such phenomenon is unfortunate because it may affect the students' academic performance and hence their future career. A study therefore needs to be conducted to examine the factors that motivate and influence the students' intention to use Internet for academic purposes in Malaysia. As this study is exploratory in nature, this study focuses on final year business undergraduate students enrolled in the Malaysian public universities only.

2.0 Literature Review

2.1 Theory of Planned Behavior

Theory of planned behavior (TPB) is a well known model that has received strong empirical support. This theory argues that attitude and subjective norms are the two prominent variables that determine intention (Fishbein & Ajzen, 1975; Ajzen & Fishbein, 1980). TPB is an extended theory of TRA by the incorporation of an additional construct, namely, perceived behavior control. Ajzen (1988) adds perceived behavior control to capture the factors beyond an individual's control towards the achievement of a behavioral goal. It is used to explain an individual's intention to perform a given behavior. Intentions are assumed to capture the motivational factors that influence behavior. They are indications of how hard people are willing to try, and of how much of an effort they are planning to exert in order to perform the behavior (Ajzen & Driver, 1992).

As an intention-based model, TBP has been widely applied to diverse disciplines such as health, leisure choice, psychology, and information technology (Ajzen & Driver, 1992; Taylor & Todd, 1995; Mathieson, 1991). In the information system related field, researchers have also found empirical support for the influence of the intention on the adoption of new technologies by using TPB (Harrison, Mykytyn & Riemenschneider, 1977; Taylor & Todd, 1995; Yi, Jackson, Park & Probst, 2006).
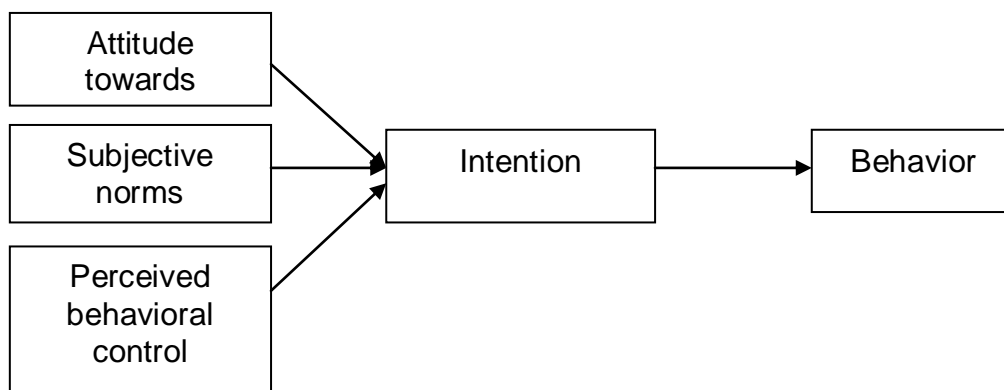
Figure 1 illustrates the TPB framework.

Figure 1: Illustration of Ajzen's Theory of Planned Behavior (Ajzen, 1991)

In TPB, there are three independent determinants of intention towards behavior, namely, attitudes towards the behavior, subjective norm, and perceived behavioral control (Ajzen, 1991).

2.2 Attitude

Attitude towards performing a behavior refers to perceptions of personal desirability to perform the behavior (Ajzen, 1988). It depends on the expectations and beliefs about personal impacts of outcomes resulting from the behavior. According to Ajzen and Fishbein (1980), a person's attitude towards a behavior represents evaluation of the behavior and its outcome. Theory of planned behavior as well as theory of reasoned action found that attitude is an influential factor in defining web-shopping behavior. Mathieson (1991, p. 3) defines attitude toward using technology as "the user's evaluation of the desirability of his or her using the system". In this study, attitude is defined as a student's subjective evaluation of the consequences of using the technologies. Limayem, Kalifa, and Frini (2000) found that attitude towards web-shopping behavior positively predicts intention to use the web for product information search, which affects web-shopping intention. O'Cass and Fenech (2003) also found that attitude towards web for retailing influences web use for retail purchases. Based on the above discussion, the following hypothesis is proposed:

H1: Attitude towards Internet usage for academic purposes is positively related to intention to use Internet for academic purposes.

2.3 Subjective Norm

In TPB, subjective norm is defined as "the perceived social pressure to perform or not to perform the behavior" by the individual (Ajzen, 1991, p.188). Subjective norm refers to the person's perception of the social pressures for or against performing the behavior in question (Ajzen, 1988). The TPB holds that subjective norm is a function of beliefs. Beliefs that underlie the subjective norm are called normative belief. Thus, if a person believes that the most important referents think that a behavior should be performed, then the subjective norm should influence the intention of the individual to perform the behavior in question. The referents here refer to a group of people who are close to the individual, for instance, family, peers, spouse, close friends, teachers, and any people who are considered important. Organizational studies have found subjective norm to be an important determinant of behavior intention to use information technology (Hartwick & Barki, 1994; Moore & Benbasat, 1993). Thus, the following hypothesis is put forth:

H2: Subjective norm is positively related to intention to use Internet for academic purposes.

2.4 Perceived Behavioral Control

Perceived behavioral control reflects the perceived ability to execute a target behavior (Ajzen, 1988). It relates to an individual's perception on the degree of easiness and difficulties in performing such behavior, and

it is assumed to reflect past experience as well as anticipated obstacles (Ajzen & Driver, 1992). This construct is affected by perceptions of access to necessary skills, resources, and opportunities to perform the behavior. If an individual does not have control over the circumstances, he/she may not have any or have less intention to perform a particular behavior. In behavior intention research, perceived behavioral control has been found a significant determinant of usage intention as revealed by Mathieson (1991). Studies on technology usage (Moore & Benbasat; 1993; Hartwick & Barki, 1994; Compeau & Higgins, 1995) also found similar result. Thus, the following hypothesis is offered:

H3: Perceived behavioral control is positively related to intention to use Internet usage intention for academic purposes.

2.5 Behavioral Intention

The major aim of TPB is to predict an individual's behavior (Ajzen, 1991). Ajzen and Driver (1992), and Taylor and Todd (1995) argued that behavioral intention can effectively influence behavior. Many studies on information technology done from various perspectives have shown that behavioral intention directly influences actual behavior (Chan & Fang, 2007; Mathieson, 1991; Taylor and Todd, 1995). Thus, the hypothesis is formulated as follows:

H4: Intention to use the Internet is positively related to using the Internet for academic purposes.

3.0 Methodology and Research Design

This study was cross sectional in nature. It involved random distribution of questionnaires to final year business students at the undergraduate level in public universities in Malaysia. Final year business students were chosen to participate in this study because they have been exposed to the higher education environment for quite some time and hence are better exposed to the Internet applications in their academic experiences.

The questionnaire contained items that measure attitude, subjective norms, perceived behavior control, and intention. These items were adopted from Taylor and Todd (1995), and Fusilier and Durlabhji (2005). There were four items on attitude, three items on subjective norms, four items on perceived behavior control, and three items on intention.

A total of 650 questionnaires were mailed to key informants in seven public universities in Malaysia, who later distributed them randomly to the participants. Out of these, 550 participants returned the completed questionnaires. However, only 421 questionnaires were usable for data analysis.

The participants consisted of 80% female and 20% male students. The gender split is consistent with the overall trend in Malaysian universities where in the recent past the intake of female students was much higher than that of male students. More than half of the participants moderately scored cumulative grade point average (CGPA) between 3.00 and 3.66 (58%) and between 2.00 and 2.99 (34%). Table 1 shows the demographic characteristics of the participants.

Table 1
Demographic characteristics of participants (n = 422)

		Demographic variables	n	%
Gender	·	Male	83	20
	·	Female	339	80
Ethnicity	·	Malay	352	83
	·	Chinese	49	12
	·	Indian	7	2
	·	Others	14	3
CGPA	·	3.67 - 4.00	37	9
	·	3.00 – 3.66	242	58
	·	2.00 – 2.99	143	33
University	·	UUM	67	16
	·	USM	26	6
	·	UiTM	82	19
	·	UTHM	36	9
	·	UTM	40	10
	·	USIM	77	18
	·	UMT	94	22
Program	·	Accounting	122	29
	·	Muamalat (Islamic Transaction)	77	18
	·	Economy	67	16
	·	Business Admin.	70	17
	·	Business Mgmt	50	12
	·	Technology Mgmt	36	8

4.0 Findings

4.1 Descriptive Analysis

A basic descriptive analysis was run to determine the average score and the dispersion of score for the constructs of attitude, subjective norms, perceived behavioral control, and intention to use Internet for academic purposes as shown in Table 2.

4.2 Reliability Analysis

Reliability test was also performed to ensure the consistency of the items used to measure the variables. The alpha values for the

constructs of attitude, subjective norm, perceived behavioral control, and intention were 0.77, 0.76, 0.80 and 0.79, respectively. The reliability coefficients were all above 0.70, and these are considered good (Nunnally, 1978). The reliability coefficients are shown in Table 2.

Table 2
Descriptive Statistics on Variables

Variable/ constructs	Mean	Standard Deviation
Attitude towards Internet usage for academic purpose (α = 0.77)		
1) Good idea	3.97	0.680
2) Wise idea	3.61	0.826
3) Like	3.88	0.769
4) Pleasant	3.70	0.744
Subjective Norms (α = 0.767)		
1) People I know	3.54	0.862
2) People influence	3.51	0.802
3) People important	3.56	0.788
Perceived Behavior Control (α = 0.802)		
1) Able	3.88	0.660
2) Resources	3.85	0.674
3) Knowledge	3.89	0.682
4) Ability	3.90	0.700
Intention to use Internet (α = 0.789)		
1) Next time	3.83	0.735
2) Predict	3.77	0.705
3) Recommend	3.84	0.767

4.3 Factor Analysis

Factor analysis was performed to ascertain that the variables of attitudes, subjective norms, perceived behavioral control, intention, and behavior were distinct constructs. Using principle component analysis with varimax rotation, the identified factors were used as inputs for regression analysis. The Kaiser-Meyer-Olkin (KMO) values for attitude, perceived behavioral control, and intention were 0.72, 0.79, and 0.72, respectively. Those scores are above the recommended value of 0.70 (Hair, Anderson, Tatham, and Black, 1998). The KMO value for subjective norm was 0.69 and it was considered acceptable. The Bartlett's Test of Sphericity for all constructs was statistically significant at 0.000 level, indicating support for factor analysis to be run.

4.4 Multiple Regression Analysis

The multiple regression results displayed in Table 3 indicates that 41% of the variance in the intention to use Internet for academic purposes are significantly explained by the independent variables of attitude, subjective norms, and perceived behavioral control (F = 97.268; p < 0.01). Furthermore, the attitude variable provides the strongest effect among the three variables with the standardized coefficients Beta at 0.343, follow by perceived behavioral control at 0.271, and subjective norms at 0.183. Thus, H1, H2 and H3 are supported.

Table 3
Multiple Regression Analysis on the Intention to Use Internet for Academic Purposes

Model	Unstandardized coefficients		Standardized coefficients	T	Sig.
	B	Std. error	Beta		
Constant	1.872	.572		3.270	.001
Attitude	.274	.036	.343	7.620	.000*
Subjective norm	.169	.040	.183	4.208	.000*
Perceived behavioral control	.234	.038	.271	6.139	.000*

R = .641
R^2 = 0.411
Adjusted R^2 = .407
F = 97.268

Note:*p< .01

Table 4 shows the simple regression result for the intention variable on the use of Internet for academic purposes. The result shows that the adjusted r square is 0.45 with the F-ratio of 346.28. This means that 45% of the variance in the Internet use behavior is significantly explained by intention at p<0.01 with a standardized coefficient Beta of 0.672. Therefore, H4 is supported.

Table 4
Simple Regression Analysis on the Behavior to Use Internet for Academic Purposes

Model	Unstandardized coefficients		Standardized coefficients	T	Sig.
	B	Std. error	Beta		
Constant	1.656	.324		5.106	.000
Intention	.521	.028	.672	18.609	.000*

r = .672
r^2 = .452
F=346.284

Note:*p< .01

5.0 Discussion and Conclusion

The present study sought to investigate behavioral intention to use the Internet for academic purposes amongst students, using theory of planned behavior (TPB) as the underlying theoretical framework. Four hypotheses were developed and they received empirical support. Attitude, subjective norms, and perceived behavioral control managed to explain significantly 41% of the variance in intention, whereas 45% of the variance in use of Internet was significantly explained by intention to use the Internet. In essence, the present study has shown the applicability of TPB in predicting intention to use and use of Internet within the academic environment. Such finding is consistent with previous studies conducted in a number of different fields (Moore & Benbasat, 1993; Hartwick & Barki, 1994; Fusilier & Durlabhji, 2005; Jong & Wang, 2009).

Results demonstrated that attitude, subjective norms, and perceived behavioral control variables are related significantly to behavioral intention, which subsequently determines behavior. With respect to predictive power, attitude toward Internet was found to be the strongest predictor of intention to use the Internet for academic purposes, followed by perceived behavioral control and subjective norms, as shown in Table 3. Based on this finding, it can be concluded that the use of the Internet amongst final year business students in Malaysia is determined by the three important variables, as proposed by TPB. This finding is parallel with that by previous work (Fusilier and Durlabhji, 2005; Noor Ismawati, 2003).

The significant effect of attitude on the intention to use the Internet and subsequently on the Internet usage itself is as expected. According to TPB, the more positive attitude a person has toward some behavior, the higher the intention to engage in this behavior. It is generally acknowledged that students tend to have favourable attitudes toward the Internet because of it allows them explore various possibilities that were not available then (Noor Ismawati, 2003; Hinson and Amidu, 2006; Chan and Fang, 2007). Indeed, because students in higher education are generally relatively young, they tend to be more receptive to the new technology and embrace it more willingly (Roe and Broos, 2005). As such, it is not surprising that that they develop a favorable attitude toward the Internet, which in turn increases their intention to use the Internet and eventually to actually use it for their academic benefits.

The present study also revealed that the ability to use the Internet and peer pressure are also significant determinants of the Internet use for academic purposes. Previous studies in ICT have generally shown that the more able an individual in handling new technologies, the more likely he/she will embrace and use it (D'Silva, Bahaman, Hayrol, and Musa, 2010). Research has also found that ability to handle the new

technology is possible when the technology is easy to use or is user friendly (Edmunds, Thorpe, and Conole, 2010). The Internet has been praised as an important technological breakthrough as it opens up to numerous possibilities, and handling the Internet is not difficult (Bakardjieva, 2005). Because it is easy to use, it is therefore not surprising to find that it attracts people to use it. In fact, because the participants in this study were relatively young and more receptive to new developments, the use of Internet for academic purposes is enhanced.

The need to be accepted as part of a social group has been a strong motivator for young people to comply with the norms of the group (Brown, 1982). Because students in the present study tended to stay on campus, such sense of belonging is exacerbated and the need to be accepted is heightened. Thus, friends and peers in this academic community will exert pressure or influence to others to keep abreast of the new technology and hence use it. This may explain why subjective norms were found to positively affect the intention to use the Internet and actual use of the Internet.

The results of this study have important implications to the management university in seeking for ways to enhance students' learning experiences with the use of the Internet for academic purposes. Web-based learning and on-line communications are some of the measures that can be taken toward this end. In addition to providing relevant and appropriate learning infrastructure, the management university can think of offering training courses and modules related to the Internet usage to further capitalize on the Internet technology.

The findings should be interpreted by taking into account the limitations of the present study. Firstly, because of the limited scope of participation, generalizing the findings to wider population of students may be suspect. Secondly, different learning environment across higher educational settings may differently shape students' perceptions and opinions on the Internet use. For these reasons, it is recommended that future research should be extended by considering a wider student population both in public and private universities in Malaysia. It is also suggested that future research explore other determinants of intention to use the Internet and Internet usage of because some of the variance remains unexplained. Perhaps, other relevant theories may be invoked towards this end to add to the existing insight obtained from the present study.

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