

The Relationship between Self-Efficacy and Attitudes towards the Use of Technology in Learning in Hong Kong Higher Education

Hon Keung Yau, Yuk Fung Leung

Abstract— The purpose of this study is to identify the relationship between self-efficacy and attitudes towards the use of technology in learning in Hong Kong higher education. 300 questionnaires were distributed and 187 useful copies were collected. The findings show that there is positive relationship between self-efficacy and attitudes towards the use of technology in learning in Hong Kong higher education.

Index Terms— attitude, Hong Kong higher education, self-efficacy

I. INTRODUCTION

Self-efficacy refers to “people’s beliefs about their capabilities to produce designated levels of performance that exercise influence over events that affect their lives” [3]. It is concerned with the belief that one can manage to execute a required behaviour or deal with a given situation such that desired outcomes can be achieved [9].

Regarding the application of technologies in learning, self-efficacy can reflect the extent of proficiency of students in using the technology. It can be changed and developed over time based on the individuals’ experience or practice. High self-efficacy implies persistence with challenge [9]; [10] and higher academic aspirations [10]. Hence, high self-efficacy of students can result in better learning experience. Moreover, Partin et al. [11] stated that self-efficacy of students is a prime factor to measure classroom performance. The learning outcomes of students can thereby be directly affected by self-efficacy.

According to Farnsworth, Shaha, Bahr, Lewis and Benson [12], attitude implies achievement in some educational circles and proper attitude results in a higher willingness of attempt and participation. Meanwhile, technology can affect students’ attitudes in learning [10]; [11]; [12]. Consequently, students’ attitudes towards the use of certain kind of technology have an influence on their learning experiences.

On the other hand, Partin et al. [11] proposed that attitude is directly associated with motivation. Also, attitude is a key factor to determine if students are able to apply what they

have learnt and their willingness to continue to learn more [13]. Therefore, students’ attitudes towards the use of tablet PCs in learning can reflect the extent that they accept and desire the integration of tablet PCs into learning environment.

However, no studies have been found to identify the relationship between self-efficacy and attitudes towards the use of technology in learning in Hong Kong higher education. The purpose of this study is to fill this gap and to identify the relationship between self-efficacy and attitudes towards the use of technology in learning in Hong Kong higher education. The research question is “What is the relationship between self-efficacy and attitudes towards the use of technology in learning in Hong Kong higher education”?

II. LITERATURE REVIEW

Bandura [14] suggested that self-efficacy has an impact on an individual’s choice of learning activities, effort, and persistence. Also, students’ self-efficacy can affect their motivation due to the judgements of their own capabilities to perform given tasks so their perceived learning can be in turn affected [15]. Some previous studies also stated the effect of self-efficacy upon students’ perceptions [16]. On the other hand, Wu & Tsai [17] reported that students’ attitude is one of the key indicators for self-efficacy. The relationship between self-efficacy and students’ attitudes is also demonstrated in a number of past studies [10]. Therefore, we hypothesize that:

H1: Self-efficacy has a positive relationship with the attitude towards using tablet PCs in learning.

III. METHODOLOGY

The questions of questionnaire were derived from [1], including in Table I.

Respondents were inquired to rate different statements regarding their attitudes (Q1 to Q10) and the degree of self-efficacy (Q11 to Q15) towards the use of tablet PCs in learning.

5-Point Likert scale is applied in this questionnaire, as Likert scale often used to ask people to state their agreement with a statement. 5-Point Likert scale consists of 5 options for each question. “1” represents “Strongly Disagree”; “3” represents “Neutral”; “5” represents “Strong Agree”.

Manuscript received May 31, 2017

H. K. Yau is with the Department of Systems Engineering and Engineering Management, City University of Hong Kong, Kowloon Tong, Kowloon, Hong Kong (corresponding author to provide phone: 852-34426158, Fax: 852-34420173, email: honkyau@cityu.edu.hk).

Y. F. Leung was with the Department of Systems Engineering and Engineering Management, City University of Hong Kong, Kowloon Tong, Kowloon, Hong Kong (email: yukfleung6-c@my.cityu.edu.hk).

TABLE I
 ITEMS OF QUESTIONNAIRE

Question	Items
1.	A tablet PC can help me to attain more ideas.
2.	A tablet PC is helpful for my learning
3.	A tablet PC can enhance my desire to learn.
4.	A tablet PC can allow me to do more interesting and imaginative work
5.	Using a tablet PC never makes me feel uncomfortable
6.	I never feel bored using a tablet PC.
7.	I am good at using a tablet PC
8.	I hope to have a regular time to use a tablet PC
9.	I hope to apply tablet PCs in various learning activities.
10.	I can use a tablet PC independently without other's help.
11.	I can download a figure from the internet using a tablet PC
12.	I can key in a website address to enter the site using a tablet PC
13.	I can check a hyperlink to enter another website using a tablet PC
14.	I can read the content on the screen using a tablet PC
15.	I can enter words into a document using a tablet PC

After the questionnaire had been constructed, pilot study was done before distributing the questionnaire in a large scale. According to Lowe [2], piloting the questions on a small group of people could effectively save valuable time as any problems would be revealed at this stage so that the quality of the questionnaire can be improved. In the pilot study, ten university students were invited to complete the questionnaire without any explanation from the researcher about it so as to find out whether they could understand the questions or not. The ten participants were then asked individually for feedback about the questionnaire after completing it for the pilot test. As a result, some wordings were modified to make the questions easier to understand.

Totally, 300 questionnaires were distributed physically and 213 copies were returned. However, only 187 copies were useful and 26 copies were incomplete or with invalid data. The successful response rate was:

$$= \frac{\text{collected and valid questionnaires}}{\text{total number of questionnaires distributed}} \\
 = \frac{187}{300} \times 100\% \\
 = 62.3\%$$

Validity and reliability are the most important and fundamental characteristics of every survey procedure. Factor analysis and reliability analysis were conducted to ensure that the collected data was valid and reliable to carry out further investigation.

Alpha model is used to conduct reliability analysis for this study. Therefore, Cronbach's alpha is the coefficient used in the analysis. The minimum Cronbach's alpha has to be larger than 0.7 [8]. On the other hand, the scale is treated as not reliable, if Cronbach's alpha is smaller than 0.7. The alpha values of self-efficacy (0.922) and attitude (0.799) are larger than 0.7, therefore these two variables are considered as reliable

Validity and reliability are the most important and fundamental characteristics of every survey procedure. Factor analysis and reliability analysis were conducted to ensure that the collected data was valid and reliable to carry out further investigation.

Factor analysis is a multivariate analysis procedure. This procedure is trying to identify underlying "factors". The purpose of factor analysis is to reduce the variables involved to explain a relationship [6]. The minimum acceptable value of factor loading and corrected item-total correlation is 0.3 [7]. In the other hand, the items with < 0.3 have to be deleted. As a result, none of the item is less than 0.3, thus, all 15 items were retained.

IV. RESULTS AND DISCUSSION

Among all respondents, about 43.3% are male and 56.7% are female. The major age range of the participants is between 18 and 23, which accounts for about 88.2%, while there are 7.5% of participants aged from 24 to 30 and the other age ranges only accounts for about 4% in total.

Regarding their educational level, 49.2% of respondents are Year 3 students, 25.7% of them are Year 2, and 17.6% of them are postgraduate students. Both Year 1 and Year 4 students account for 3.2% and the others account for 1.1% of respondents. Most of the participants are engineering students, which account for 64.7%. There are 4.3% of respondents majoring in business and 3.7% of them majoring in science. Participants majoring in social science and creative media account for 2.7% and 1.1% respectively. 23.5% of respondents are studying in other majors such as nursing.

Moreover, the majority of respondents are full-time students, which account for 90.9%, while part-time and exchange students account for about 8% and 1.1% respectively. Most of the participants have GPA with the range of second honour in which 47.1% are 3.0-3.49 and 29.9% are 2.5-2.99. There are about 8.0% of respondents whose GPA is in the range of first honour and about 9.1% have GPA in the range of third honour.

In addition, 65.2% of respondents have their own tablet PCs while 34.8% of them do not have.

The finding shows that the Pearson Correlation Coefficient is +0.397 ($p=0.000<0.01$) which indicates statistically significant and positive correlations between self-efficacy and attitude. As a result, there is medium correlation between self-efficacy and attitude and their relationship is positive and significant. Hence, H1 is supported.

The survey has revealed that university students' self-efficacy is positively related to their attitudes towards the use of tablet PCs in learning and this is supported by other studies as well [10]; [17]. Schunk [15] pointed out that students' self-efficacy would affect their attitudes in learning due to the difference in their beliefs about their capabilities to perform skills, master learning materials and obtain knowledge. Consequently, students with higher self-efficacy in using tablet PCs would have more positive attitudes towards the use of tablets in learning.

V. CONCLUSION

It is concluded that there is positive relationship between self-efficacy and attitudes towards the use of technology in learning in Hong Kong higher education.

Since the target participants were students in higher education, the findings of this study contributed to those educators who are teaching in higher education. Based on the findings, the educators can know the relationship between

self-efficacy and attitudes towards the use of technology in learning in Hong Kong higher education.

The limitations of this study are small sample size. If sufficient resource is provided, the sample size could be larger which the education level will be more evenly distributed.

For future study, students in different countries can be investigated separately, as the result could be significantly different from this study.

REFERENCES

- [1] S.H. Yang, "Exploring College Students' Attitudes and Self-Efficacy of Mobile Learning", *Turkish Online Journal of Educational Technology-TOJET*, Vol. 11, No. 4, 2012, pp. 148-154.
- [2] M. Lowe., *Beginning Research: A Guide for Foundation Degree Students*. Routledge, 2006.
- [3] M. Moran, M. Hawkes, & O. El Gayar, "Tablet personal computer integration in higher education: Applying the unified theory of acceptance and use technology model to understand supporting factors", *Journal of Educational Computing Research*, Vol. 42, No. 1, 2010, pp. 79-101.
- [4] E. Grandon, O. Alshare, and O. Kwan, "Factors influencing student intention to adopt online classes: A cross-cultural study," *Journal of Computing Sciences in Colleges*, vol. 20, no. 4, 2005, pp. 46-56.
- [5] N.O. Ndubisi, "Factors of online learning adoption: A comparative juxtaposition of the theory of planned behavior and the technology acceptance model," *International Journal on E-Learning*, vol. 5, no. 4, 2006, pp. 571-591.
- [6] T.J. Walker, and S. Maddan, *Statistics in Criminology and Criminal Justice: Analysis and Interpretation*. Jones & Bartlett Learning, 2009.
- [7] C. Fornell, and D.F. Larcker, "Evaluating structural equation models with unobservable variables and measurement error," *Journal of Marketing Research*, vol. 18, no. 1, 1981, pp. 39-50.
- [8] J.C. Nunnally, *Psychometric Theory*, New York: McGraw-Hill, 1978.
- [9] C.O. Walker, & B.A. Greene, "The relations between student motivational beliefs and cognitive engagement in high school", *Journal of Educational Research*, Vol. 102, No. 6, 2009, pp. 463-472.
- [10] T.O. Jr, Tenhet, *An examination of the relationship between tablet computing and student engagement, self-efficacy, and student attitude toward learning*, California State University, Fresno, 2013.
- [11] M.L. Partin, J.J. Haney, W.A. Worch, E.M. Underwood, J.A. Nurnberger-Haag, M.W. Gerhardt, & K.G. Brown, "Individual differences in self-efficacy development: The effects of goal orientation and affectivity", *Learning and Individual Differences*, Vol. 16, No. 1, 2006, pp. 43-59.
- [12] B.J. Farnsworth, S.H. Shaha, D.L. Bahr, V.K. Lewis, & L.F. Benson, "Preparing tomorrow's teachers to use technology: Learning and attitudinal impacts on elementary students", *Journal of Instructional Psychology*, Vol. 29, No. 3, 2002, pp. 121-138.
- [13] R.F. Mager, *Developing Attitude Toward Learning*, 1968.
- [14] A. Bandura, "Self-efficacy: toward a unifying theory of behavioral change", *Psychological review*, Vol. 84, No. 2, 1977, p. 191.
- [15] D.H. Schunk, "Self-efficacy and academic motivation", *Educational psychologist*, Vol. 26, No. 3-4, 1991, pp. 207-231.
- [16] R. Bates, & S. Khasawneh, "Self-efficacy and college students' perceptions and use of online learning systems", *Computers in Human Behavior*, Vol. 23, No. 1, 2007, pp. 175-191.
- [17] Y.T. Wu, & C.C. Tsai, "University Students' Internet Attitudes and Internet Self-Efficacy: A Study at Three Universities in Taiwan", *Cyberpsychology & behavior*, Vol. 9, No. 4, 2006, pp. 441-450.