Gender Difference of Self-Efficacy and Attitudes Towards the Use of Technology in Learning in Hong Kong Higher Education

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Abstract—**The purpose of this study is to identify whether male students have more positive attitude and higher self-efficacy in using tablet PCs than female students. 300 questionnaires were distributed and 187 useful copies were collected. The findings show that male students do not have significantly higher self-efficacy in using tablet PCs than female students and male students do not show more positive attitude towards the use of tablet PCs in learning than female students.**

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

I. INTRODUCTION

Gender difference is considered as one of the factors affecting students' use of technology [1], [2], [3]. Numerous past researches have demonstrated the existence of gender difference, showing that male students generally have higher self-efficacy and more positive attitudes towards the use of technology in learning than female students [1], [3], [4], [9], [10], [11]. However, no studies have been found to identify the gender difference of 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 gender difference of self-efficacy and attitudes towards the use of technology in learning in Hong Kong higher education. The research question is "What is the gender difference of self-efficacy and attitudes towards the use of technology in learning in Hong Kong higher education"?

II. LITERATURE REVIEW

The presence of gender difference is due to the characterized social and biological differences between males and females. Some past studies revealed that the use of technology in learning is a dominant activity for male students who thereby have more positive attitudes towards learning with technology than female students [1], [12], [13]. Also, males tend to be more assertive and dominant about technology use while females tend to be more passive [14], [15]. Moreover, females perceive themselves being a part of

computer culture like males but males still dominate in computing [1].

In addition, Margolis and Fisher [16] stated that females' participation in computer-related field is lower than males. Female students are likely to be less attracted to technologies than males [11]. Vekiri and Chronaki [11] also suggested that female students' less positive perceptions and lower interest in technology lead to a lower tendency for them to develop computer competence than male students do.

Based on the impacts of gender difference on the use of technology in learning, gender is considered as an independent variable in this study. Hence, we hypothesize that:

H1: Male students have higher self-efficacy in using tablet PCs than female students.

H2: Male students have more positive attitudes towards the use of tablet PCs in learning than female students.

III. METHODOLOGY

The questions of questionnaire were derived from Shih-hsien Yang [17], including in Table I:

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 PC0
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

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".

After the questionnaire had been constructed, pilot study was done before distributing the questionnaire in a large scale. According to Lowe [18], 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:
= collected and valid questionnaires / total number of questionnaires distributed
= 187/300 x 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

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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

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 significance value under Levene's Test is 0.014, which is smaller than 0.05, indicating that male and female have unequal variances so the data in the row of "Equal variances not assumed" will be used. Under unequal variances, the 2-tailed significance value in "t-test for Equality of Means" is 0.956, which is greater than 0.05. As a result, there is no significant difference between male and female students based on their self-efficacy of using tablets.

The mean values of male (4.2889) and female students (4.2830) on self-efficacy are more or less the same, though the mean for male is just slightly higher. This implies that there is no major gender difference between male and female students in higher education regarding their self-efficacy of using tablet PCs.

Based on the result of the independent t-test, the hypothesis H1 is rejected. In this study, male students do not have significantly higher self-efficacy in using tablet PCs than female students.

In addition, the finding shows that the significance value in Levene's Test is 0.269, which is greater than 0.05, so the data in the row of "Equal variances assumed" should be used. The value of significance (2-tailed) in "t-test for Equality of Means" is 0.657, which is greater than 0.05. Therefore, there is no significant gender difference on students' attitudes towards the use of tablet PC in learning.

The mean value for male students is 3.6864, while the mean for female is 3.7170, which is slightly higher but still similar to that for male. This means that the attitudes of male and female students towards the use of tablet PCs in learning are more or less the same.

Based on the above results, the hypothesis H2 was rejected. In this research, male students do not show more positive attitude towards the use of tablet PCs in learning than female students.

Based on the above results, the hypotheses H1 and H2 are rejected. The data findings indicate no significant difference between male students and female students on both self-efficacy and attitudes towards the use of tablet PCs in learning. This goes against the results about the presence of

gender differences in other past studies [1], [3], [4], [5], [9], [10], [11].

Although many studies reported that males have higher self-efficacy and more positive attitudes in technology use than females, a few past studies found that no significant gender differences were shown in the computer attitudes of males and females [19], [20]. Yang [17] also found no significant differences between male and female attitudes and self-efficacy in mobile learning. Anderson, Schwager and Kerns [3] demonstrated that gender would not affect the use of tablet PCs.

The absence of gender difference is probably due to the cultural influences in Hong Kong. According to Volk, Yip and Lo [21], more girls are now interested in technology and the differences among girls varied with technology experience. Moreover, a study conducted by The University of Hong Kong found that female students achieved greater improvements in their computer skills than male students after completion of one-year studies and this raised their confidence in using technology [22].

Therefore, the findings show that the use of tablet PCs in learning for Hong Kong students in higher education is not a dominant activity for male students. Being more exposed to various technologies in learning, female students can also have high self-efficacy and positive attitudes towards using tablet PCs in learning as male students do.

VI. CONCLUSION

It is concluded that (i) male students do not have significantly higher self-efficacy in using tablet PCs than female students; (ii) male students do not show more positive attitude towards the use of tablet PCs in learning than female students.

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 encourage both female and male students to use tablet PC for learning.

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.

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