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A RESEARCH OF NEW-TECHNOLOGY LEARNING BEHAVIOR IN DIGITAL PUBLISH DOMAIN IN TAIWAN

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Synopsis:

The study employed the questionnaire method. The questionnaire targeted 285 university students from Taiwan. All of them specialize in the digital publishing field. In regard to questionnaire tools, the design of the questionnaire was based on the theory of plan behavior by Fishbein & Ajzen (2010). The questionnaire adopted the Technology Acceptance Model (TAM) and took into account social cognitive views.

A Research of New-Technology Learning Behavior in Digital Publish Domain in Taiwan

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***Abstract*— The purpose of this study is to explore about the influence of new-technology learning behaviors' significant cause on digital publish domain students. In regard to questionnaire tools, the design of the questionnaire was based on the theory of plan behavior by Fishbein & Ajzen (2010). The questionnaire adopted the Technology Acceptance Model (TAM) and took into account social cognitive views. The data collected were analyzed using such analysis methods as descriptive statistics, correlation analysis, and confirmatory factor analysis, as well as the multi-group structural equation modeling technique. To achieve the purpose, we survey 285 students of two universities in Taiwan. The study reached two conclusions. First, there was no remarkable mediation effect between the behavioral intention and actual learning behavior; these results were not fully consistent with theory, a probable cause for which was that the learning behaviors of the university students were influenced by self-evaluation or were limited by the curriculum arrangements made by the lecturers. Second, the results showed that perceived usefulness, peer norm, instructor readiness, and, autonomy learning are crucial factors in the research model.**

Keywords—digital Publish Domain, new-technology learning behavior, theory of plan behavior

I. INTRODUCTION

New media, insights from research, and alterations in organizational structures are changing longstanding assumptions that have shaped postsecondary learning (Dede & Grimson, 2013). However, very little effort is taken for multidisciplinary learning at the higher education level regarding new-technology learning behavior. The purpose of this study is to investigate the new-technology learning behaviors of students. This research predicting multidisciplinary learning students' new technology learning behavior by revised theory of plan behavior (TPB) with technology acceptance model (TAM) and social cognitive views.

II. LITERATURE REVIEW

A. TPB and TRA

To explain learner's technology adoption learning behavior, Ajzen's the theory of planned behavior or Fishbein and Ajzen's theory of reasoned action were used by exploring education research (Cheon, Lee, Crooks, & Song, 2012; Cheung & Vogel, 2013; Liaw, Huang, & Chen, 2007; Sanchez-Franco, Martinez- Lopez, & Martin-Velicia, 2009). However, theory of planned behavior (Ajzen, 1991) or theory of reasoned action (Fishbein & Ajzen, 2010) only discuss some variables which affect behavior (i.e. attitude, subjective norms, perceived behavioral control, intention and, behavior). In term of theory to explain theory of planned behavior and theory of reasoned action which emphasize the learner's perceived beliefs of resource and opportunity (i.e. perceived behavior control), lacking of social cognitive theory which emphasizing the other perceived factors. (i.e. perceived usefulness, perceived ease of use, peer norm, instructor readiness, self-efficacy, and autonomy learning). Although it is not enough to explain new-technology multidisciplinary learning behavior only basing on above theories, they are still none dispensable theories to understand behavior.

B. Technology accepted the theory

Technology accepted the theory proposed by Davis. Bagozzi and Warshaw (1989) which took point of view from the users to explain their technology acceptance behavior, they thought perceived ease of use and perceived usefulness are the key factors to affect attitude. Researchers apply the theory to the e-learning education field (e.g. knowledge management system, online learning, digital learning, and mobile learning) (Agudo-Peregrina, Hernandez-Garcia, & Pascual-Miguel, 2014; Karaali, Gumussoy, & Galisir, 2011; Lee, Yoon, & Lee, 2009; Motaghian, Hassanzadeh, & Moghadam, 2013). Thus, we proposed that perceived ease of use and perceived usefulness have significant effect on attitude.

C. Social cognitive theory

Social cognitive theory considers value, goals, and expectancy which are crucial motivations for learning behavior (Bandura, 1977; 1986; 1991; 1997; Eccles, 1983; Eccles & Wigfield, 1985; Wigfield, 1994). Festinger (1957) thought leaner tends to compare their ability to others who through obsess those self-similar learners can improve their learning condition as the goal's measurement is unclear or unknown. Wheeler and Suls (2005) thought social cognitive theory which is a social comparison process and find the learner's motivation for the value, goals, and expectancy of internal factors and external factors.

Cheung and Vogel (2013) applied theory of planned behavior to explore Hong Kong college student's the technology adoption behavior of using Google application. Research found that peer norm had a significant effect on intention but the instruct readiness won't. Cheon et al. (2012) applied theory of planned behavior to explore American college student's mobile learning. Research found that instruct readiness was the key factor to affect subjective norms. Otherwise, peer norm had an insignificant effect. Thus, we proposed that peer norm and instructor readiness have significant effect on subjective norms.

Compeau and Higgins (1999) proposed the social cognitive theory that self-efficacy had positive influence. In other words, when the learner has higher self-evaluation for adoption of new technology, who also would have higher expectation on the learning result. This research results is identical with the research result by Taylor and Todd (1995) which show that students with a more positive self-efficacy has a higher perceived behavioral control.

Autonomy learning is another crucial factor of perceived behavior control, which is self-paced learning capability. It is also beneficial to understand learner's learning process. For

example, goal-setting which lets the learner become a pursuer. Likewise, mobile learning technology can help student has autonomy learning ability and also provide learning flexibility (Liaw et al., 2007). For example, goal-setting, which can connect the learner with result. Likewise, mobile learning technology can help student learning and also provide flexibility. But it still require student self-learning and motivation. The concept of Autonomy learning is consistent with social cognitive theory proposed by Bandura (1986) who thinks learners would have a positive behavior because they have expectation on their goals and positive behavioral beliefs. Cheon et al. (2012) applied theory of planned behavior to explore American college students's mobile learning behavior. Study found that self-efficacy and autonomy learning are the key factors to perceived behavioral control. Thus, we suggested that self-efficacy and autonomy learning have significant effect on perceived behavioral control.

III. METHODOLOGY

In regard to questionnaire methods, the design of the questionnaire was based on the theory of plan behavior by Fishbein & Ajzen (2010). The questionnaire adopted the Technology Acceptance Model (TAM) and took into account social cognitive views. The terminologies of questionnaire were also localized to reconcile any cultural discrepancies between each place. The final version of the questionnaire underwent expert revision. The data collected were analyzed using such analysis methods as descriptive statistics, correlation analysis, and confirmatory factor analysis, as well as the structural equation modeling technique.

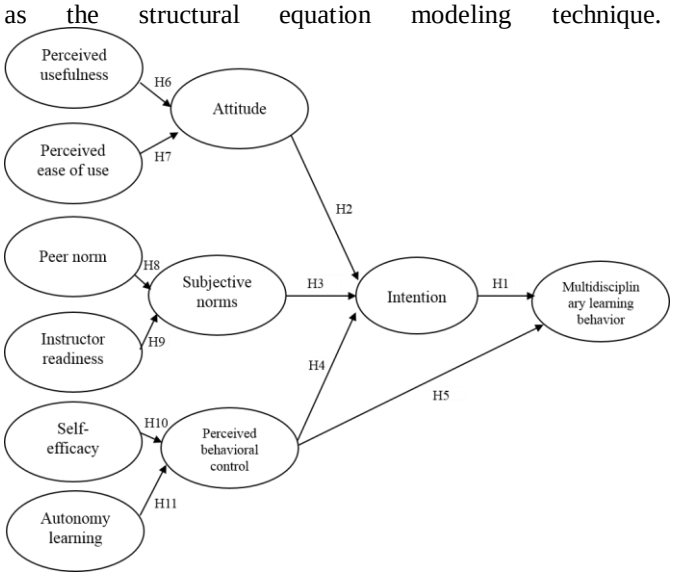

Fig. 1. Research framework and hypotheses.

A. Research framework and hypotheses

Fig. 1 depicts our research model, which extended Fishbein and Ajzen's theory of reasoned action by adding six factors on the model. The research hypotheses were established as follows:

H1. A learner with a higher intention would has a higher multidisciplinary learning behavior.

H2. A learner with a more positive attitude has a higher technology adoption intention.

H3. A learner with higher subjective norms has higher technology adoption intention.

H4. A learner with a higher perceived behavioral control has higher technology adoption intention.

H5. A learner with a higher perceived behavioral control would has a higher multidisciplinary learning behavior.

H6. A learner with a higher perceived usefulness would has a higher attitude.

H7. A learner with a higher perceived ease of use would has a higher attitude.

H8. A learner with higher peer norm has higher subjective norms.

H9. A learner with a higher instructor readiness has higher subjective norms.

H10. A learner with a higher self-efficacy would has a higher perceived behavioral control.

H11. A learner with a higher autonomy learning would has a higher perceived behavioral control.

B. Pretest

Based on the result from the pilot test, the questionnaire was further refined. The final questionnaire consisted of 47 items to assess the eleven constructs of the proposed research model. Items included in the final revised questionnaire were considered highly reliable since the individual Cronbach's alpha coefficients of the eleven constructs were all greater than 0.7 (see Table 2). Items in the survey were measured using a seven-point Likert scale ranging from (1) strongly disagree to (7) strongly agree.

C. Survey

To achieve the purpose, we survey 285 students of two universities in Taiwan for understanding student's learning behavior with new-technology.

IV. RESULTS

A. Subjects

A total of 350 responses were collected for investigating the research framework and hypotheses. After deleting 65 responses that were incomplete, the remaining 285 valid responses were used for further analysis. All of the 285 subjects were undergraduate students and most were female (79.3%). Most of the subjects (70.9%) surf on the internet all the time.

B. Measurement model

Confirmatory factor analysis was performed to examine the representativeness of the question items to their respective dimensions. The standardized factor loadings and squared multiple correlations must exceed .7 and .5, respectively. The composite reliability was the sum of the reliability of all the measured variables and indicated the internal consistency of the constructs; a higher reliability implied greater internal consistency among the constructs, and .7 was the threshold for reliability. Table I lists the respective composite reliability values, all of which were between .6 and .90. Thus, the internal consistency in each dimension was ideal, exceeding the standard of .6. The average variance extracted (AVE) showed the variation explained by the latent variables for each measured.

TABLE I. THE RESULTS OF MEASUREMENT MODEL

	SFL	SMC	CR	AVE
Attitude			0.87	0.63
AB3	0.77	0.60		
AB4	0.85	0.72		
AB5	0.86	0.74		
AB6	0.69	0.48		
Subjective norms			0.80	0.50
SN1	0.73	0.54		
SN2	0.68	0.46		
SN3	0.77	0.60		

SN4	0.65	0.42		
Perceived behavioral control			0.81	0.52
PBC1	0.74	0.54		
PBC3	0.68	0.47		
PBC4	0.72	0.51		
PBC5	0.74	0.54		
Intention			0.87	0.64
BI2	0.87	0.76		
BI3	0.81	0.65		
BI4	0.70	0.49		
BI6	0.80	0.65		
Multidisciplinary	1.00	1.00	1.00	1.00
Perceived usefulness			0.87	0.62
PU3	0.80	0.64		
PU4	0.75	0.56		
PU5	0.78	0.61		
PU6	0.81	0.66		
Perceived ease of use			0.91	0.72
PEU4	0.82	0.67		
PEU5	0.86	0.74		
PEU6	0.84	0.71		
PEU7	0.87	0.75		
Peer norm			0.83	0.55
PN2	0.58	0.33		
PN3	0.71	0.50		
PN5	0.84	0.70		
PN7	0.81	0.66		
Instructor readiness			0.89	0.67
IR1	0.70	0.48		
IR3	0.88	0.78		
IR4	0.88	0.77		
IR5	0.79	0.63		
Self-efficacy			0.91	0.71
SE3	0.85	0.72		
SE4	0.82	0.67		
SE5	0.88	0.78		
SE6	0.83	0.68		
Autonomy learning			0.90	0.70
LA3	0.86	0.73		
LA4	0.86	0.73		
LA5	0.82	0.68		
LA6	0.82	0.67		

C. Structure model

The goodness-of-fit indices for the hypothesized measurement model are summarized in Table 4. Here, we report eight fit indices indicating acceptable model fit: (a) the$\chi 2$ statistic; (b) the ratio $\chi 2$ to the degrees of freedom ($\chi 2$/d.f.), with values of less than 3 indicating acceptable fit; (c) CFI, with values of greater than 0.9 indicating acceptable fit; (d) RMSR, with values of less than 0.05 indicating acceptable fit; (e) SRMR, with values of less than 0.08 (with CFI of greater than 0.92) indicating acceptable fit; (f) RMSEA, with values of less than 0.07 (with CFI of 0.9 or higher) indicating acceptable fit; (g) GFI, with values of greater than 0.9 indicating acceptable fit; and (h) AGFI, the values of greater than 0.8 indicating acceptable fit.

Our analysis showed that intention presented an insignificant effect on learning behavior (β=-0.03, p>0.05) (as Fig. 2), which was not supported H1. However, the path from attitude, subjective norms, and perceived behavioral control to intention were significant (attitude to intention, β = 0.30, p<0.001; subjective norms to intention, β = 0.28, p<0.001; perceived behavioral control to intention, β = 0.43, p<0.001), which were support H2, H3, and H4. The factors which based on the technology accepted the theory and the social cognitive theory, the path from perceived usefulness and ease of use to attitude (β =0.79, p<0.001& β =-0.08, p>0.05), the path from peer norm and instructor readiness to subjective norms (β =0.58, p<0.001& β =0.18, p<0.05), and the path from self-efficacy and autonomy learning to perceived behavioral control (β =0.15, p>0.05& β =0.61, p<0.001) had partly positive effects, which supported H6, H8, and H10. Moreover, perceived behavior control(β =0.29, p<0.01) did have a significant effect on learning behavior, thus H5 was supported.

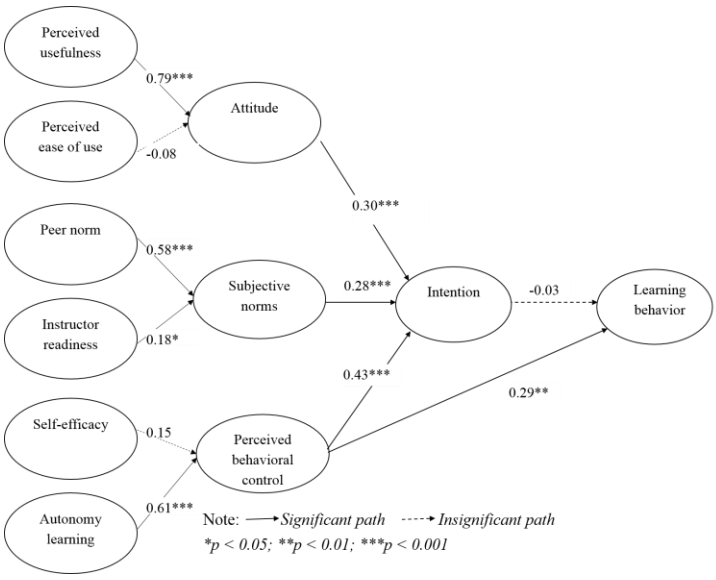

Fig. 2. Path analysis of the research model

V. CONCLUSION AND RECOMMENDATIONS

The study reached two results. First, there was no remarkable mediation effect between the behavioral intention and actual learning behavior displayed by the digital publishing students; these results were not fully consistent with theory, a probable cause for which was that the learning behaviors of the university students were influenced by self-evaluation or were limited by the curriculum arrangements made by the lecturers. Second, there were differences between the research model and measurement model, and the causal relationships between variables were not consistent; the researchers believe that the study was influenced by the software applications used by the teachers and students in Taiwan and the variation in the degree of autonomy.

Second, the results showed that perceived usefulness, peer norm, instructor readiness, and, autonomy learning are crucial factors in the research model. It is worth to note that the intention has insignificant effect on actual learning behavior, even the causal relationships between variables were consistent between the research model and measurement model.

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