

Adult Learners' attitudes toward web-based professional development and Internet self-efficacy in Taiwan

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Abstract: The purpose of this study was to investigate adult learners' Internet self-efficacy and attitudes toward web-based professional development. The sample consisted of 228 volunteer adult learners from a college in middle Taiwan. Two instruments, Internet self-efficacy (ISS) and attitudes toward web-based professional development (AWPD), were implemented for the investigation in this study. The results showed that the two instruments used revealed high reliability. The adult learners' Internet self-efficacy was positively related to their attitudes toward web-based professional development. In addition, adult learners of different ages or Internet experiences would express different attitudes toward web-based professional development.

Keywords: Adult learners, Internet self-efficacy, attitudes, web-based professional development

1. Introduction

Improvements in information and communication technology and the need for off-campus delivery have led to the increased use of web-based learning tools around the world. As the Internet is broadly used in the educational area, learners may have more opportunities to utilize web-based learning (Engelbrecht, 2005). The Web-based environment of learning focus on opening the access to education and training provision

for adult learners, thus freeing the adult learners from the traditional constraints of time and place (Huang, 2002). As there are more and more adult learners pursuing vocational training or lifelong learning through online programs, their characteristics in terms of web-based professional development should be highlighted by educational researchers.

Some studies have revealed that attitudes toward a new technology play an important role in its acceptance and usage (Lu, Zhou, & Wang, 2009). Over the past decade, researchers have explored learners' attitudes toward computers and the Internet (Oral, 2008; Tsai & Lin, 2004). However, comparatively fewer studies have been conducted to investigate adult learners' attitudes toward web-based learning or web-based professional development. Hence, one of the purposes of this study was to assess adult learners' attitudes toward web-based learning or web-based professional development.

Internet self-efficacy refers to learners' expectations of and confidence in using the Internet. As previous studies stated (Tsai & Tsai, 2003; Wu & Tsai, 2006), learners with higher Internet self-efficacy are most likely to succeed in web-based learning tasks. Therefore, this study also focused on gauging adult learners' Internet self-efficacy.

Hence, this study was conducted to examine adult learners' attitudes toward web-based professional development, their Internet self-efficacy, and the relationships between them. Also, the roles of age and Internet experience were investigated.

2. Method

2.1 Sample

The participants of this study were 228 volunteers from a college in middle region of Taiwan. All of them were adult learners who had registered in web-based programs to earn workforce credits or advanced degrees. 137 (60%) of them were female while the remaining 91 (40%) were male.

2.2 Instruments

To assess adult learners' Attitudes toward Web-Based Professional Development (AWPD) and Internet Self-Efficacy (ISS), two instruments were implemented in this study. The Attitudes toward Web-Based Professional Development (AWPD) was modified from Kao and Tsai (2009). As a result, the initial pool of items in the survey included a total of 27 items, which were presented by using a five-point Likert scale (ranging from 1, "strongly disagree" to 5, "strongly agree"). Five factors were designed for AWPD. The details of the five scales are as follows:

1. Perceived usefulness scale: measuring perceptions of the extent to which adult learners perceive that the impact of web-based professional development are positive and useful.
2. Perceived ease of use scale: measuring perceptions of the extent to which adult learners perceive that the web-based professional development are easy to use.
3. Affection scale: assessing perceptions of the extent to which adult learners express favorable feeling about web-based professional development.
4. Anxiety scale: assessing perceptions of the extent to which adult learners experience the anxiety about web-based professional development.
5. Behavior scale: assessing perceptions of the extent to which adult learners perceive actual practice and willingness to use web-based professional development.

The second instrument of this study, the Internet Self-efficacy Survey (ISS), was also modified from Kao and Tsai's (2009). The ISS employed in this study included two scales, and the items of the two scales were presented with bipolar strongly confident/ strongly unconfident statement on a five-point Likert scale. The details of the two scales are as follows:

1. Basic self-efficacy scale: measuring adult-learners' self confidence at a basic level of using the Internet, such as using Internet-related tools.
2. Advanced self-efficacy scale: measuring adult-learners' confidence of Internet-based interaction or advanced usages of the Internet.

2.3 Data analysis

To fulfill the main purposes of this study, the factor analysis, correlation and one-way ANOVA analyses were conducted as the statistical methods in this study. The factor analysis was utilized to reveal the scales of the instruments on the adult learners' AWPDP and ISS. The correlation analysis was employed to examine the relationship between AWPDP and ISS. Then through one-way ANOVA analysis, the adult learners' AWPDP and ISS among different age groups and Internet experiences were compared.

3. Results

3.1 Factor analysis

To clarify the structure of the adult learners' attitudes toward web-based professional

development (AWPD), the principle component analysis was utilized as the extraction method, with the rotation method of varimax with Kaiser normalization. An item was retained only when it loaded greater than 0.5 on the relevant factor and less than 0.5 on non-relevant factor. Thus, the initial 27 items were reduced to 13 items. The latest version of the AWPDP consisted of 13 questionnaire items with three scales, namely, perceived usefulness, perceived ease of use, and behavior. The reliability coefficients for the three scales of the AWPDP, respectively were 0.90 (perceived usefulness, 5 items), 0.88 (behavior, 4 items) and 0.73 (perceived ease of use, 4 items). The α value of the whole AWPDP questionnaire is 0.84 and these factors explained 82.08 % of variance totally. Therefore, these scales are deemed to be sufficiently reliable for assessing adult learners' attitudes toward web-based professional development.

To clarify the structure of the adult learners' Internet self-efficacy, the same process of principle component analysis was utilized. As a result, the initial 16 items were reduced to 7 items, with two factors: "Basic self-efficacy (with 5 items)" and "Advanced self-efficacy (with 2 items)." 68.06 % variance was explained by these two scales. In addition, the α values for these two scales were 0.84 and 0.80, respectively, and 0.84 for the whole ISS questionnaire, indicating that these scales could be considered as adequately reliable for gauging adult learners' Internet self-efficacy.

3.2 Adult learners' scores on the scales

Adult learners' scores on three AWPDP scales were all over 3 points on a five-point scale (see Table 1). They attained highest scores on the perceived ease of use scale (an average of 4.24 per item) on the 1-5 Likert measurement. Although they scored relatively low on the behavior scale, the average score (3.88 per item) was still higher than the mean of the 1-5 Likert scale (i.e. 3). The results indicated that the adult learners tended to focus more on the ease of use aspect of web-based professional development and appreciated the potential usefulness brought by web-based professional development courses. But their relatively low score on the behavior scale still implied that some of them might not be completely willing to exploit web-based professional development.

Table 1 also shows the adult learners' mean scores and the standard deviations on the ISS scales. The adult learners' had high scores on both ISS scales. They attained an average of 4.21 on basic self-efficacy scale and 4.22 on advanced self-efficacy scale. This result implied that the adult learners in this study tended to display high confidence of using the Internet for both basic and advanced purposes.

Table 1 Adult learners' scores on the scales of AWPDP and ISS

Scale	Mean	SD
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Attitudes toward web-based professional development		
Perceived usefulness	4.10	0.69
Perceived ease of use	4.24	0.97
Behavior	3.88	0.73
Internet self-efficacy		
Basic	4.21	0.62
Advanced	4.22	1.24

3.3 Correlation between attitudes toward web-based professional development and Internet self-efficacy

The Pearson correlation coefficients among the questionnaire scales are presented in Table 2. The relationships between the AWPDP and ISS indicated that all of the variables were significantly positively correlated with each other. These results indicated that adult learners expressing high self-efficacy regarding the Internet would display more positive perceptions and frequent use toward web-based professional development. In particular, adult learners' responses on the behavioral scale were relatively highly correlated with those on the basic self-efficacy scale ($r=0.50, p<0.01$). It seemed that adult learners with higher basic self-efficacy regarding the Internet might tend to use web-based professional development more frequently.

Table 2 Correlation between the adult learners' attitudes toward web-based professional development and Internet self-efficacy

Scale	Perceived usefulness	Perceived ease of use	Behavior
Basic self-efficacy	0.30**	0.25**	0.50**
Advanced self-efficacy	0.37**	0.19**	0.38**

** $p<0.01$

3.4 The role of age groups and Internet experiences in adult learners' web-based professional development and Internet self-efficacy

In order to compare the possible differences derived from different age groups and Internet experiences, we categorized participants into three age groups (the less than 30 years group, the 31-40 years group and the more than 41 group) and seven Internet experience groups (the less than 3 hours group, the 3-6 hours group, the 6-12 hours group, the 12-18 hours group, the 18-24 hours group, the 24-30 hours group and the more than 30

hours group). The ANOVA tests followed by a series of post hoc tests (Scheffé tests) were performed. The results of these tests are presented in Table 3 and 6.

In table 3, the ANOVA test indicated that age groups played a role in adult learners' basic Internet self-efficacy and their perceived usefulness toward web-based professional development. Scores for the adult learners who are less than thirty years were higher than the corresponding scores of those who are more than forty years ($F=6.01, p<0.01$). Scores for adult learners who are between thirty and forty were higher than the corresponding scores of those who are less than thirty years old ($F=5.29, p<0.01$).

TABLE 3 Adult learners' Internet self-efficacy and attitude toward attitudes toward web-based professional development among different age groups

Age Group	(1) Less than 30 years (mean, SD)	(2) 31-40 years (mean, SD)	(3) 41+ years (mean, SD)	F(ANOVA) Scheffe Test
Basic self-efficacy	4.39(0.48)	4.18(0.64)	3.91(0.73)	6.01** (1)>(3)
Advanced self-efficacy	6.05(1.21)	5.10(1.31)	4.91(1.41)	1.79(n.s.)
Perceived Usefulness	3.91(0.78)	4.22(0.58)	3.94(0.82)	5.29** (2)>(1)
Behavior	5.51(0.98)	5.27(0.83)	5.30(0.74)	1.51(n.s.)
Perceived Ease of use	5.50(1.05)	5.21(1.05)	5.27(0.84)	0.61(n.s.)

** $p < 0.01$.

In table 4, the ANOVA test indicates that Internet experience played a role in adult learners' behavior scale in their attitude toward web-based professional development. The scores for the adult learners' with Internet experience between eighteen and twenty-four hours were higher than those with less than three hours ($F=4.35, p<0.05$).

TABLE 4 Adult learners' Internet self-efficacy and attitude toward web-based professional development among groups of different Internet experiences

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	F(ANOVA)
Internet	<3	3-6	6-12	12-18	18-24	24-30	>30	Scheffe
Exp.	hrs	hrs	hrs	hrs	hrs	hrs	hrs	Test
	mean	mean	mean	mean	mean	mean	mean	
	(SD)	(SD)	(SD)	(SD)	(SD)	(SD)	(SD)	
Basic self-efficacy	3.57 (0.74)	4.07 (0.22)	4.25 (0.54)	4.35 (0.54)	4.43 (0.66)	4.19 (0.60)	4.36 (0.55)	1.61(n.s.)

Advanced	3.60	4.23	4.07	4.76	4.34	4.12	4.29	0.84(n.s.)
self-efficacy	(1.07)	(0.76)	(0.71)	(2.90)	(0.76)	(0.78)	(0.60)	
Perceived	4.04	4.04	4.08	4.16	4.14	4.00	4.22	1.81(n.s.)
Usefulness	(0.54)	(0.85)	(0.76)	(0.59)	(0.72)	(0.66)	(0.52)	
Behavior	3.35	3.83	3.87	4.06	4.25	3.84	3.88	4.35*
	(0.85)	(0.73)	(0.67)	(0.66)	(0.75)	(0.60)	(0.73)	(5) >(1)
Perceived	3.95	4.19	4.29	4.30	4.32	4.12	4.38	0.01(n.s.)
Ease of use	(0.85)	(0.58)	(1.64)	(0.50)	(0.65)	(0.66)	(0.55)	

* $p < 0.05$.

4. Conclusion and Discussion

To explore adult learners' perspectives on web-based professional development, this study developed two questionnaires to assess adult learners' attitudes toward web-based professional development (AWPD) and Internet Self-efficacy (ISS). The results show that the AWPD and ISS developed in this study were deemed to be sufficiently reliable to assess the adult learners' attitudes toward web-based professional development and Internet self-efficacy. Moreover, through ANOVA analyses, the roles of adult learners' age and Internet experience were also revealed.

Adult learners in the present study scored high on perceived usefulness and ease of use scales, but relatively low on the behavior scale of web-based professional development. These results probably suggested that more things still need to be done to increase adult learners' willingness to take part in web-based learning activities. Thus, a better understanding regarding demands of adult learners and barriers faced by adult learners is needed to enable educators to have adequate planning to make web-based professional development more effective.

The mean scores of the ISS questionnaire revealed that the adult learners had both high basic Internet self-efficacy and advanced Internet self-efficacy. The AVONA tests showed that adult learners with different ages responded significantly differently on basic Internet self-efficacy and perceived usefulness scale. Adult learners with different Internet experience also displayed significantly different scores on the behavior scale of AWPD. Based on the results, the roles of age and Internet experience can be assured in adult learners' Internet self-efficacy and attitudes toward web-based professional development.

The results of this study are quite helpful to facilitate the understanding and implementation of adult learners' attitudes toward web-based professional development. By using the AWPD questionnaire, educators and researchers can assess and review adult learners' attitudes toward web-based professional development in a more effective way, with possibly higher validity. Previous studies (Donavant, 2009; Mak et al., 2001) have

described the advantages of web-based learning over traditional ways of learning for adults for their continuing education of professional development. Further study about adult continuing education could also base on the results of this study to investigate more interrelations between factors in adult learners' web-based professional development.

References

- [1] Donavant, B. W. (2009). The new, modern practice of adult education online instruction in a continuing professional education setting. *Adult Education Quarterly*, 59, 227-245.
- [2] Engelbrecht, E. (2005). Adapting to changing expectations: Post-graduate students' experience of an e-learning tax program. *Computers & Education*, 45, 217-229.
- [3] Huang, H.-M. (2002). Toward constructivism for adult learners in online learning environments. *British Journal of Educational Technology*, 33, 27-37.
- [4] Kao, C. P., & Tsai, C. C. (2009). Teachers' attitudes toward web-based professional development, with relation to Internet self-efficacy and beliefs about web-based learning. *Computers & Education*, 53, 66-73.
- [5] Lu, Y., Zhou, T., & Wang, B. (2009). Exploring Chinese users' acceptance of instant messaging using the theory of planned behavior, the technology acceptance model, and the flow theory. *Computers in Human Behavior*, 25, 29-39.
- [6] Mak, H.Y., Mallard A. P., & Kwok, J. C. K. (2001). Designing a hospital intranet nurse learning system for improving continuing nursing education. *Innovations in Education and Teaching International*, 38, 397-405.
- [7] Oral, B. (2008). The evaluation of the student teachers' attitudes toward Internet and democracy. *Computers & Education*, 50, 437-445.
- [8] Tsai, C.-C., & Lin, C. C. (2004). Taiwanese adolescents' perceptions and attitudes regarding the Internet: Exploring gender differences. *Adolescence*, 39, 725-734.
- [9] Tsai, M. J. & Tsai, C. C. (2003). Information searching strategies in web-based science learning: the role of Internet self-efficacy. *Innovations in Education and Teaching International*, 40, 43-50.
- [10] Wu, Y.-T., & Tsai, C.-C. (2006). University students' Internet attitudes and Internet self-efficacy: A study at three universities in Taiwan. *CyberPsychology & Behavior*, 9, 441-450.