ANALYSIS OF FACTORS IN TECHNOLOGICAL AND VOCATIONAL SCHOOL TEACHERS' PERCEIVED ORGANIZATIONAL INNOVATIVE CLIMATE AND CONTINUOUS USE OF E-TEACHING: USING COMPUTER SELF-EFFICACY AS AN INTERVENING VARIABLE

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ABSTRACT
This study aims to analyze the correlation (N=335) among technological and vocational school teachers' perceived organizational innovative climate, computer self-efficacy, and continuous use of e-teaching in Taiwan. Teachers' perceived organizational innovative climate includes five factors, namely, job autonomy, innovative leadership, resource support, innovative culture, and group cohesion. Computer self-efficacy includes four factors, namely, playfulness, ease of use, effectiveness, and usefulness. Continuous use of e-teaching includes three factors, namely, goal identification, instructional performance, and flow experience. Participants responded to a 5-point Likert-type scale for each factor. Analysis was conducted using the structural equation modeling (SEM), and a good model fit was found for both the measurement and structural models. Research findings demonstrate that technological and vocational schools teachers' organizational innovative climate significantly and directly influences continuous use of e-teaching. Organizational innovative climate significantly and indirectly influences continuous use of e-teaching by computer self-efficacy. Technological and vocational schools teachers' organizational innovative climate and computer self-efficacy fit the influence model and empirical data of continuous use of e-teaching.
Keywords: computer self-efficacy, continuous use of e-teaching, organizational innovative climate.

INTRODUCTION

In recent years, low birth rates and expansion of higher education suggest that when responding to industrial changes and manpower demands, technological and vocational schools should treat teaching excellence and creative teaching as the principle for sustainable operation (Chou, Shen, Hsiao, & Chen, 2010a). Upon educational technology, continuous use of e-teaching becomes the key of creative teaching. Internet information allows schools to promote organizational learning cultures of creative teaching and construct organizational innovative climates (Chou, Shen, & Hsiao, 2010b; Gumusluoglu, & Ilsev, 2009; Zaman, Ananda rajan, & Dai, 2010).

Regarding schools, the diffusion innovation theory indicates that innovation is diffused by members of social systems through certain channels. The organizational innovative climate of schools is based on organizational knowledge and an innovative culture, where individual innovative behavior is gradually formed through organizational interactions, which serves to enrich individual learning of the implication of innovative knowledge (Gumusluoglu, & Ilsev, 2009; Huang, & Chuang, 2007). Through interpersonal relationships in organizations, organizational innovative knowledge can be learned, instructed, and shared. After accumulating rich innovative experience and information technology knowledge in schools, teachers would learn and review operations of digital technology and innovative behaviors, and recognize innovative climates (Martinez, Sauleda, & Huber, 2001; Neill, McKee, & Rose, 2007).

Compeau and Higgins (1995) found that the encouragement of others, behavioral imitation, and high-rank supervisors' support would positively influence users' computer self-efficacy, and increased self-efficacy would positively influence computer performance. When teachers apply innovative instructional strategy to courses, such as the Lego Mindstorm module or the computer-assisted mechanical drawing of e-learning, students could obtain greater learning achievements. By innovative instructional strategies, teachers can take advantage of opportunities to "train at work" and learn through the experiences of problem solving through practical use, which would enhance their professional growth (Chen, Kao, & Huang, 2008).

In Taiwan, business information and e-commerce have developed rapidly, and in recent years, schools have promoted e-learning and distance learning. Hence, students are familiar with the Internet and related tools. Teachers can renew teaching materials and interact with students through the convenience of the e-platform (Ho, Kauffman & Liang, 2007;

Susser, & Ariga, 2006). By editing teaching materials and e-learning resources, teachers reorganize learning contents. In addition, the use of examples and analogies in teaching materials can be cognitive outcomes of teachers' teaching innovations and profession (Husual & Tirrib, 2007; Shulman & Quinlan, 1996; Teo, 2009a; Zaman, Ananda rajan, & Dai, 2010). Wu & Yang (2009) found that "innovative climate of information infused instruction," "pedagogical literacy of information infused instruction," and "innovative motivation of information infused instruction" have significant direct effect on "innovative behavior of information infused instruction". The attitudes of qualified instructors at vocational technology universities and colleges using IT to improve the quality of knowledge lectured. Computer literacy is the key factor that affects teachers' utilizations of IT in teaching. The policy and peers' factors have indirect effects on utilizations through interest and fit intermediate variable. The equipment variable has no effect on utilizations, but it relates some of external variables (Chu, Chu, & Hung, 2004)

Based on the above, teachers have the intention to spend time and efforts making e-teaching materials, which can be involved in instructions. There are some factors of teachers' continuous use of e-teaching were enhancement of students' learning outcomes by e-teaching, teachers' continuous use of e-teaching will allow schools to recognize technological and vocational school teachers' e-teaching demands, and improvements to innovative e-teaching instructions would respond to sustainable operations of technological and vocational schools.

PURPOSES OF THIS STUDY

The paper, Analysis of factors in technological and vocational school teachers perceived organizational innovation climate and continuous use of e-teaching: using computer self-efficacy as an intervening variable, discussed the variables which may influence vocational teachers continuous use of technology and found the relationships among the variables. The purposes of this study are to address the 4 following issues.

1. There is no significant correlation between technological and vocational school teachers' organizational innovative climate and continuous use of e-teaching.
2. There is no significant correlation between technological and vocational school teachers' perceived organizational innovative climate and computer self-efficacy.
3. There is no significant correlation between technological and vocational school teachers' computer self-efficacy and continuous use of e-teaching.
4. Influence models of technological and vocational school teachers' organizational innovative climate, computer self-efficacy, and continuous use of e-teaching fit the data collected by this study.

REVIEW OF LITERATURE

Organizational Innovative Climate

Innovative climate is based on innovative behaviors or outcomes; in other words, members identify and trust organizational innovation through behavioral traits, such as freedom, openness, adventure, and support shown by workers (Amabile, 1996; Iyer, LaPlaca & Sharma, 2006). Baer and Frese (2003) indicated that organizational development should not only be innovative, but also include an innovative climate and psychological security in order to result in constant innovation.

Regarding the effects of teachers' perceived organizational innovative climate on computer self-efficacy, according to Dunn and Mott (2009), organizational innovative climate influences organizational members' interactions and performances. Teachers' trust and identification would influence their innovative behavior, which would benefit the schools, increase the use multiple instructional methods, and develop students' multiple wisdom and creativity. In addition, they will actively promote innovative ideas and try to implement them. Morale in organizations influences workers' common consensus, and thus, their behaviors of mutual support, which will help enhancing organizational innovative performance (Reuvers, van Engen, Vinkenburg & Wilson-Evered, 2008; Weigl, Hartmann, Jahns, & Darkow, 2008; Zaman, Ananda rajan, & Dai, 2010).

Regarding the influence of teachers' perceived organizational innovative climate on continuous use of e-teaching, Wu & Yang (2009) found that "innovative climates of information infused instruction" have a significant direct effect on "pedagogical literacy of information infused instruction". By a task and technology fit model, Chu, Chu, and Hung (2004) demonstrated that the trend of teachers' use of information technology in support of traditional instruction would provide enhancement through the intervening variable of "cognitive fit". When teachers perceive higher relative benefits, compatibility, or a lower complexity of the e-teaching system, they would have higher intentions to adopt it (Hoffer & Alexander, 1992). Agarwal and Prasad (1997) indicated that observations, compatibility, and trial ability have significant and positive influences. Voluntary intentions have significant and negative influences; whereas, use intentions, relative benefits, and outcome demonstrations have significant and positive influences.

Based on the above, teachers' perceived high organizational innovative climate can enhance continuous use of e-teaching (Hoffer & Alexander, 1992; Wu & Yang, 2009), and organizational performance (Weigl, Hartmann, Jahns, & Darkow, 2008; Zaman, Ananda rajan, & Dai, 2010). Regarding the technology acceptance model, teachers' use of

technology and computer self-efficacy can influence teachers intentions and behaviors in the continuous use of e-teaching (Brinkerhoff, 2006; Hung., Lian & Chang, 2005; Matulich, Papp, & Haytko, 2008; Tung, & Chang, 2007). Thus, this study intends to further probe into the effects of computer self-efficacy between technological and vocational school teachers' perceived organizational innovative climate and continuous use of e-teaching.

Computer Self-Efficacy

Computer self-efficacy is an individual's judgment of their computer competence. It is emphasized that computer self-efficacy reflects individual perceptions and abilities to fulfill job requirements of computer competence, which is not related to practical computer skills (Compeau & Higgins, 1995; Wilfong, 2006). Computer self-efficacy focuses on an individual's perceived ability in computer related situations and refers to judgments of capacity to accomplish a computer related job (Guriting, Chunwen, Ndu, 2007; Koc, & Bakir, 2010; Saade, & Kira, 2009).

Igbahia and Iivari (1995) suggested that organizational support significantly influences self-efficacy. Factors of teachers' use of information technology include relative benefits, trial ability, compatibility, eases of use, effectiveness, usefulness, and complexity (Hoffer, & Alexander, 1992). Currently, many studies demonstrate that in comparison with traditional instructions, computer-based instructions can enhance instructional quality, and teachers' instructional effects will be enhanced by continuous use of e-teaching (Teo, 2009a; Wilfong, 2006).

Regarding the influence of teachers' computer self-efficacy on continuous use of e-teaching, teachers with high computer self-efficacy tend to master computer use and computer technology, thus, they are more likely to become involved in educational technology and continue using e-learning (Aderson, & Maninger, 2007; Faseyitan, Libii, & Hirschbuhl, 1996). Marakas, Yi, and Johnson (1998) found that computer self-efficacy could trigger teachers' motivations to use computers during instruction. Teachers with high computer self-efficacy are more willing to use e-teaching in instruction. Teachers with higher computer self-efficacy would significantly increase the use of electronic communications in teaching (Koc, & Bakir, 2010; Vajargah, & Jahani, 2010). Hill, Smith, and Mann (1987) suggested that students with higher computer self-efficacy would have greater intentions to learn and use computers. For teachers, e-teaching materials can be presented by vision, hearing and even kinesthetic capacities, and thus, would be easier for students of all learning types to comprehend the information, and effective clues will enhance students' memory. Student teachers' self-efficacy is a significant influence on whether they use technology in a traditionalist or constructivist way (Teo, 2009b).

Based on the above, for teachers, there is a close correlation between computer self-efficacy and continuous use of e-teaching (Olivier & Shapiro, 1993). Even with sufficient equipment, if teachers have low computer self-efficacy, their intention to use information technology during instruction is reduced (Faseyitan, Libii, & Hirschbuhl, 1996; Koc, & Bakir, 2010).

Continuous Use of E-Teaching

Continuous use of e-teaching methods indicates teachers' abilities to integrate media technology, such as characters, images, animation, video, and sound through technology and computers. In teaching, they function as learning materials for browsing, interactive operation, and media delivery in order to enhance students' learning effects (Barclay, Thompson, & Higgins, 1995; Marakas, Yi, & Johnson, 1998). Teachers intend to include on-line and off-line learning e-teaching activities, such as creating e-learning content, software, construction services, and courses through computer-based tools.

Teachers' continuous use of e-teaching indicates that according to instructional content and strategies, they have the abilities to apply computer media, the Internet, and treat information technology as instructional tools. Statements of teachers' continuous use of e-teaching methods are as below (Davis, & Venkatesh, 1996; Hsu, Ju, Yen, & Chang, 2007; Katz, Blumer & Gurevitch, 1974; Oliver, 1992):

1. Studies suggest that in regard to uses and gratifications, with students' psychological motivations and social expectations, teachers would have different patterns of media exposure, resulting in expectations toward "satisfaction of demands" and "other results" (Katz, Blumer & Gurevitch, 1974; Matulich, Papp, & Haytko, 2008). In teachers' continuous use of e-teaching, use motivation of instruction is related to teachers' instructional demands. Media of instructional materials is associated with teachers' use and reading of digital tools. Only proper instructional information devices will satisfy the demands of continuous use of e-teaching. Factors of technological and vocational school teachers' e-teaching include the contents of the teaching materials, the design of the teaching material, the instructional platform, services for users, the amount of information provided, and the difficulty of the interface (Vajargah, & Jahani, 2010) .
2. Regarding the Expectation Confirmation Theory (ECT), teachers judge instructional performance of e-teaching and students' learning satisfaction by comparing outcomes before and after e-learning (Huang, & Chuang, 2007; Oliver, 1992). ECT can be used to understand the factors that affect technological and vocational school teachers' continuous use of e-teaching (Benbasat & Barki, 2007). Bagozzi (2007) indicated that emotions could influence users' behaviors.

For teachers, e-teaching could enhance students' "playfulness" in learning, and thus, it is an issue worthy of further study.

3. The technology acceptance model aims to explain the decisive factors of users' acceptance of information technology, and analyzes the influences of external factors on users' beliefs, attitudes, and intentions of technology use (Davis, Bagozzi & Warsaw, 1989). Analysis of the factors of teachers' continuous use of e-teaching, through organizational innovative climate and computer self-efficacy, can help to probe into the perceived usefulness and ease of use. These two factors will influence users' attitudes, behavioral intentions, and use behaviors toward technology.

Bandura (1997) suggested that teachers' self-efficacy expectation is a key factor in goal-setting, choice of activities, willingness to invest extra efforts, and behavioral performance. Regarding e-teaching, besides the perspective of self-efficacy, teachers' perceived organizational innovative climate is also an important issue. Technological and vocational school teachers can accomplish more effective teaching goals by computer multimedia, and helping students to learn how to cultivate knowledge and skills in searching for information through technology. Teachers can more effectively prepare for instruction through technological tools, creating greater diversity in content and activities, and conduct more diverse evaluations, as information technology is the key to instruction.

METHODOLOGY

Research Design

This study employed a structural equation modeling (SEM) to analyze the relationships between technological and vocational school teachers' perceived organizational innovative climate, computer self-efficacy, and continuous use of e-teaching. Data were collected through a survey questionnaire, which is comprised of questions on demographics and multiple items for each construct in the study. Normal distribution testing of the related variables in the model of this study is shown in Table 1. Although all observation variables do not reach normal distribution ($p<.05$), multi-variance normal test is insignificant ($p>.05$), which demonstrates normal distribution. According to the conditions of ML, within the most commonly used approach in SEM one of the conditions should be a simple random sampling that meets multi-variance normal distribution. Samples of this study meet the conditions of ML. Some scholars suggest that it is influential only when Kurtosis is above 25; therefore, when Kurtosis is below 25, ML is still an applicable analysis. Boomsma and Hoogland (2001) compared and probed into the completeness of different estimation methods, and concluded that in regard to models with observation variables above 6 or 8. With non-normal distribution, ML has better statistical traits. Thus, although overall variables of this study meet the multi-variance normal distribution of ML, a single variable does not meet normal distribution. Kurtosis of multi-variance distribution is not large (<25); therefore, this research estimates the model by ML.

Table 1 Mean and standard deviations of variables and normal distribution test

Variables	Mean	Standard deviation	Skewness	Kurtosis	X2	p-value
Job autonomy	3.86	.58	-.15	.02	3745.06	.000
Innovative leadership	3.99	.60	-.22	-.36	3910.07	.000
Resource support	4.00	.62	-.47	.49	4818.47	.000
Innovative culture	3.66	.66	-.26	.12	3420.17	.000
Group cohesion	3.30	.77	.04	.28	3367.89	.000
Goal identification	4.27	.59	-.36	-.63	5235.28	.000
Instructional performance	4.18	.57	-.27	-.79	4142.41	.000
Flow experience	4.22	.54	-.43	-.22	3882.69	.000
Playfulness	4.24	.49	-.34	-.44	3646.63	.000
Ease of use	3.68	.63	.02	.15	4266.56	.000
Effectiveness	3.45	.74	-.03	.08	3710.11	.000
Usefulness	3.87	.65	-.18	-.01	4009.75	.000
Total	3.93	.40	-.26	-.08	221.03	1.000

Research Participants and Data Collection

This study treated teachers of technological and vocational schools as the population, and adopted random sampling and cluster sampling for a survey. A total of 335 valid samples were collected, and the analysis of their gender, seniority, current post, current level, teaching background, school attributes, school category, and number of students is shown in Table 2.

Table 2 Distribution of participants' background in formal scales

Basic information	Group	No of people	%
Gender	Male	231	69.0%
	Female	104	31.0%
Educational background	University (or below)	12	3.6%
	Master	105	31.3%

	Doctor	218	65.1%
Seniority	5 years (and below)	55	16.4%
	More than 5 years and less than 10 years	99	29.6%
	More than 10 years and less than 15 years	87	26.0%
	Over 15 years	94	28.1%
Current post	Full-time teachers and administration staff	159	47.5%
	Full-time teachers	176	52.5%
Current level	Professor	27	8.1%
	Associate professor	125	37.3%
	Assistant professor	97	29.0%
	Lecturer	86	25.7%
Teaching background	Science, engineering, agriculture and design	135	40.3%
	Business, management, tourism and recreation		
	Livelihood, health and medical care	134	40.0%
	Liberal arts, law, education and general	20	6.0%
	knowledge	46	13.7%
School attributes	Public	122	36.4%
	Private	213	63.6%
School category	University of technology	175	52.2%
	College of technology	160	47.8%
Number of students	5,000 (and below)	73	21.8%
	More than 5,001 and less than 10,000	159	47.5%
	Above 10,001	103	30.7%

Measures

A 43-item survey questionnaire was developed to measure participants' self-efficacy, uses of technology, and demographic information. The scale for organizational innovative climate included five constructs, namely, job autonomy (five items), innovative leadership (5 items), resource support (5 items), innovative culture (5 items), and group cohesion (TP) (five items). The scale for computer self-efficacy included playfulness (five items), ease of use (five items), effectiveness (five items), and usefulness (five items). The scale for continuous use of e-teaching included goal identification (five items), instructional performance (five items), and flow experience (five items). The items reflected in the questionnaire could allow participants to take reference from their personal experiences when responding. Each item was measured on a five-point Likert scale of 1=strongly disagree to 5=strongly agree. A total of 16 items were used to measure organizational innovative climate, 12 items were used to measure computer self-efficacy, and 15 items measure continuous use of e-teaching. These items are listed in the Appendix.

Research Tool

The research tool was the "Investigation of factors in technological and vocational school teachers' continuous use of creative teaching". The compilation of this scale was based on the concepts of the computer self-efficacy scale by Karsten. & Roth (1998), climates for innovation scales by King, Chemrmont, West, Dawson, and Hebl (2007), and the climate for innovation scale by King, Chemrmont, West, Dawson, and Hebl.

In this study, three experts evaluated the fitness of the questions in order to verify the expert fitness of the scale. Night teachers from technological and vocational schools were invited to answer the questionnaire in order to enhance content validity. Ten technological and vocational schools were selected for a pre-test, with 135 teachers as the subjects. A total of 120 valid samples were collected; with a valid return rate of 88.9%. The scale in this study was a self-reported inventory, based on a Likert 5-point scale, where the range of "agree" to "disagree" is denoted by 5 to 1, respectively. The factor names, number of items, validity, and reliability levels of each aspect in this scale are as shown in Table 3.

Table 3 Factors, number of items, validity and reliability of technological and vocational school teachers' perceived organizational innovative climate and computer self-efficacy on scale for creative teaching outcome

Scale for organizational innovative climate				**Scale for computer self-efficacy**				**Scale for constant use of e-teaching**			
Names of factor	**No of items**	**Factor loading**	**Cronbach α**	**Names of factor**	**No of items**	**Factor loading**	**Cronbach α**	**Names of factor**	**No of items**	**Factor loading**	**Cronbach α**
Innovative culture	3	17.42	.88	Playfulness	3	27.44	.93	Goal identification	5	24.37	.90
Job autonomy	3	14.68	.80	Ease of use	3	15.18	.88	Job achievement	5	22.03	.87
Resource support	4	12.03	.80	Effectiveness	3	14.66	.88	Flow experience	5	19.66	.76

Innovative leadership	3	10.79	.73	Usefulness	3	9.23	.77			
Group cohesion	3	7.16	.52							
Accumulated explained variance		62.09		Accumulated explained variance		66.53		Accumulated explained variance		66.06
kmo		.878		kmo		.886		kmo		.874
Total reliability Cronbach α			.91	Total reliability Cronbach α			.91	Total reliability Cronbach α		.91

Data Analysis

Regarding data processing of formal survey, the returned questionnaires were coded. Linear Structural Relations (LISREL) was used to validate the correlation and influences among creative teaching self-efficacy, organizational innovative climate, and creative teaching effect by Statistical Package for Social Science, SPSS 10.0. Statistical test criterion of this study is α=0.05.

FINDNGS

Fit test of Influence Model of Continuous Use of E-Teaching Materials

This study validated the model by LISERL8.52. The estimation method was determined after examining the samples, and model estimation was carried out by software. Parameters after software estimation are shown in Table 4. Before the model fit test, whether the estimation coefficient is over the defined scope was verified. Only when parameter coefficients estimated do not violate the estimation can the fit test be conducted.

According to the definitions of Hair, Anderson, Tatham, and Black (1998), the three following items can be used to examine estimation violations: 1) negative error variable exists; 2) normalized coefficient is above or approximate to 1 (0.95 is the usual threshold), and 3) significant standard deviation. According to Table 2, parameters estimations reveal positive error variables, and there are no negative variables. Normalized coefficient is 0.25~0.96, with only one parameter β10 above 0.95, and the remaining within the scope. Therefore, parameters estimations are not violated, and fit could be conducted.

Table 4 Normalized coefficients of path analysis of influence model of technological and vocational schools teachers' continuous use of e-teaching materials

Parameter	Non-normalized ML estimation	Standard deviation	t value	Normalized coefficient	Parameter	Non-normalized ML estimation	Standard deviation	t value
λ1	0.42	0.026	16.28*	0.15	ε1	0.54	0.013	11.84*
λ2	0.42	0.027	15.34*	0.18	ε2	0.49	0.015	12.23*
λ3	0.50	0.027	18.31*	0.14	ε3	0.64	0.013	10.67*
λ4	0.49	0.037	16.12*	0.21	ε4	0.53	0.018	11.91*
λ5	0.38	0.040	9.45*	0.50	ε5	0.22	0.037	13.57*
λ6	0.45	0.026	17.45*	0.13	ε6	0.61	0.013	10.38*
λ7	0.46	0.024	19.00*	0.09	ε7	0.69	0.093	8.81*
λ8	0.40	0.024	16.64*	0.11	ε8	0.58	0.011	10.97*
λ9	0.25	0.025	10.32*	0.17	ε9	0.27	0.013	13.15*
λ10	0.40	0.031	12.69*	0.25	ε10	0.39	0.020	12.22*
λ11	0.47	0.037	12.54*	0.35	ε11	0.38	0.029	12.30*
λ12	0.29	0.034	8.38*	0.36	ε12	0.19	0.026	13.57*

Note: Those without standard deviations are criterion indicators of *p<.05

This study conducted model fit testing by general criterion, according to fit measures estimated by the statistical method, in order to find out the fitness between the research data and model. Measures of this study are based on absolute fit, incremental fit, and parsimonious fit, as classified by Hair, Anderson, Tatham, & Black (1998). In addition, construct reliability and validity tests of variables were used to determine the internal structural fit. Analytical results are shown below.

Overall Fit

Based on the above, overall fit can be measured by absolute fit, incremental fit, and parsimonious fit. After estimation by LISERL8.52, according to Table 5, the chi-square of the model is = 407.56, p<.05, which is significant, and shows that there are significant differences between the covariance matrix of the model and the empirical data. Chi-square

testing can be easily influenced by the number of samples and normality of the data. Therefore, when evaluating overall model fit, this study includes other measures.

This study first examines theoretical validation of the model regarding unsatisfying evaluation standards. After reviewing MI, the model is modified according to the rationality of the theory. Although model fit after modification is enhanced, estimates of Usefulness and Computer self-efficacy do not reach a level of significance, and re-estimation is required. Although modified χ testing fails to reach a statistical significance level, the model fit is improved and mostly satisfies the standards. In addition, tests of overall fit are generally positive.

According to the analytical results of the revised model in Table 5, in absolute fit measures, GFI= 0.85, which is slightly lower than the standard of 0.9. According to Gefen, & Straub (2000), GFI should be above 0.90, thus, this model is rejected. AGFI= 0.77, which is lower than the standard of 0.8. Gefen and & Straub (2000) suggests that AGFI should be above 0.80 thus, thus, the model is rejected. RMSEA= .014 and <0.08. According to Jarvenpaa, Tractinsky, & Vitale, (2000), RMSEA should be lower than 0.08, thus, based on the measures above, absolute fit of this model is not good.

As to incremental fit and parsimonious fit measures, according to Gefen and & Straub (2000) and Hair et al. (1998), when NFI, IFI, RFI, and CFI are above 0.9, PNFI and PGFI should be above 0.5 in order for the model to be accepted. According to data tested, NFI= 0.91, which is above the standard 0.9. It shows that the model is accepted. IFI= 0.92, which is above 0.9 means that the model is accepted. RFI= 0.88, which is lower than the standard 0.9. It means that the model is almost acceptable. CFI= 0.92, thus, the model is relatively acceptable. PNFI= 0.70, which is above the standard 0.5 means that the model is relatively acceptable. PGFI= 0.55, which is above 0.5 means that the model is acceptable.

According to the incremental and parsimonious fit measures above, the models of this study are acceptable. However, absolute fit is not good, which suggests that the models are still acceptable, as the overall model meets empirical data. The lower GFI and AGFI levels mean that the model can hardly explain the empirical model theory.

Table 5 Results of overall model fit test of technological and vocational school teachers' continuous use of e-teaching

	Evaluation items and outcome (N=335)	**Evaluation standard**	**Scholars**	**Fit**
Absolute fit	χ2= 407.34			
	d .f.=51	<5	Hair et al. (1998)	Poor
	χ2/ d .f.=7.9	>0.9	Hair (2010)	Poor
	GFI= 0.85	>0.8	Hair (2010)	Poor
	AGFI= 0.77	<0.1	Hu & Bentler (1999)	Acceptable
	SRMR=0.08	<0.08	Jarvenpaa et al. (2000)	Acceptable
	RMSEA= .014			
Incremental fit	NFI= 0.91	>0.9	Bentler & Bonett (1980)	Acceptable
	NNFI=0.90	>0.9	Bentler & Bonett (1980)	Acceptable
	IFI= 0.92	>0.9	Bentler & Bonett (1980)	Acceptable
	CFI= 0.92	>0.9	Bagozzi&Yi (1988)	Acceptable
Parsimonious fit	PNFI= 0.70	>0.5	Bentler & Bonett (1980)	Acceptable
	PGFI= 0.55	>0.5	Bentler & Bonett (1980)	Acceptable

Structural Fit

Regarding structural model fit, Hair Jr. et al (1998) suggested the measurement significance test and the R2 of latent dependent variables of structural parameters. The R2 of dependent variables should be higher than the standard of 0.5, and correlation among the latent variables should be lower than 0.90.

Regarding the structural fit test, according to the structural parameters of the influence model of continuous use of e-teaching materials in Table 2, apart from organizational innovative climate, job values and computer self-efficacy are significant (t>1.96, p>.05). In addition, as to the evaluation of R2 latent dependent variables, according to Table 4-20, organizational innovative climate, and computer self-efficacy are 0.42 and 0.52, respectively. The R2 of job values is lower than the standard 0.50, and the R2 of computer self-efficacy is higher than 0.50, which meet the evaluation standards; therefore, the structural model fit of this study is not good.

Correlation coefficients of the latent variables in Table 6 are further tested. The coefficients of the three latent variables are 0.75~0.96. The correlation coefficient of job values on organizational innovative climate is higher than 0.90, while

the remaining are lower than 0.90. Thus, the three latent variables may affect the structural model fit due to overly high correlations.

Table 6 Average variances extracted and the correlation coefficient of latent variables on the influence model of continuous use of e-teaching materials

Latent variables	R2	Organizational innovative climate	Job values	Computer self-efficacy
Organizational innovative climate	0.75	1		
Continuous use of e-teaching	0.96	0.96	1	
Computer self-efficacy	0.79	0.75	0.79	1

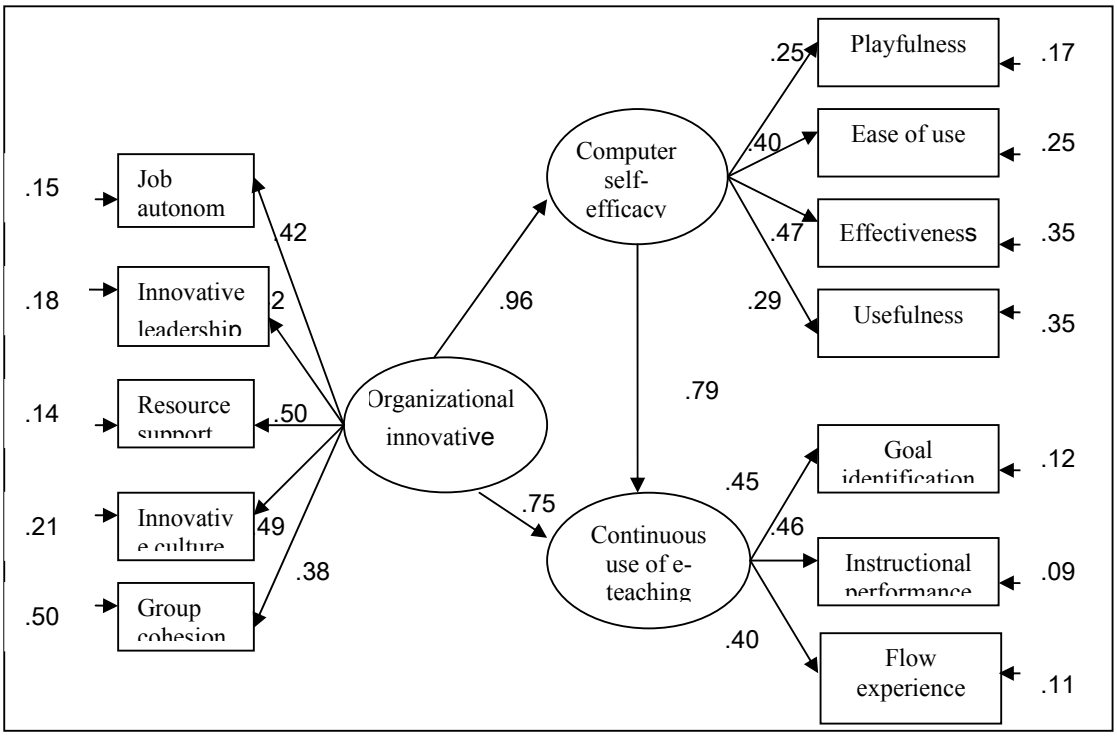

Figure 1 Path of technological and vocational school teachers' continuous use of e-teaching materials

DISCUSSION

This study aims to analyze the correlations among technological and vocational school teachers' perceived organizational innovative climates, computer self-efficacy, and continuous use of e-teaching in Taiwan. The findings are as shown below:

1. Technological and vocational school teachers' organizational innovative climate, resource support, and innovative leadership show significant influence on goal identification and instructional performance in continuous use of e-teaching. Innovative leadership and resource support allow teachers to recognize objectives of e-teaching in schools. When schools encounter environmental changes and competition, teachers gradually understand and trust the measures of the schools' innovative leadership. Through resource support and rewards by schools, teachers can fulfill their creativity and further develop courses and e-teaching design. This will allow them to accomplish school objectives and instructional performance in order to meet environmental changes (Damanpour & Wischnevsky, 2006).
2. Technological and vocational school teachers' organizational innovative climate, job autonomy, and innovative culture show significant influence on ease of use and effectiveness of computer self-efficacy. Goal identification and instructional performance in technological and vocational school teachers' continuous use of e-teaching significantly influence playfulness and ease of use" of computer self-efficacy. Teachers' perceived innovative culture and job autonomy will enhance teachers' new ideas, evaluations, and implementation of e-teaching. It is

one of the key factors on teachers' computer self-efficacy (Karsten, & Roth, 1998; Mohrman, Cohen & Mohrman, 1995).

3. Technological and vocational school teachers' organizational innovative climate significantly and directly influences continuous use of e-teaching. Organizational innovative climate significantly and indirectly influences continuous use of e-teaching through computer self-efficacy. Technological and vocational schools teachers' organizational innovative climate and computer self-efficacy fit influence model and empirical data of continuous use of e-teaching. Therefore, schools should respect and support instructional creativity. Through cognition of innovation and e-teaching, teachers can constantly ponder on innovative teaching approaches and information technology. They will enhance instructional performance and instructional goals. Teachers' active promotion of innovative ideas in e-teaching and practical use of e-learning will encourage students' learning. They identify with organizational goals through organizational innovative climate in order to develop e-teaching plan, and constantly adopt and implement e-teaching. Thus, they will result in useful e-teaching and flow experience (Angle & Van de Ven, 2000; Hage & Aiken, 1970; Igbahia & Iivari, 1995; Susser, & Ariga, 2006).
4. Although the model of this study reveals goodness of fit, the fit effect remains unsatisfying, which suggest that there are some latent variables that have not been elaborated. Variables in models sometimes fail to reveal the ideal explanatory effect; thus, this study further probes into the model with a more complete overall fit.

LIMITATIONS OF THE STUDY

1. This study focuses on the influence of technological and vocational school teachers' perceived organizational innovative climate on continuous use of e-teaching. Chou, Shen, Hsiao and Chen (2010a) found that technological and vocational school teachers that also undertake administrative jobs tend to identify more closely with the organizational innovative climate. When teachers undertake administration jobs, they use the school network system and are engaged in activities of e-processing. Would such activities cause them to highly identify with continuous use of e-teaching? This is a limitation of this study.
2. This study measures teachers' perceptions during the first, middle and final stages of e-teaching. Some teachers perceived e-teaching as a means to use multimedia, such as films and power point, during instruction. Teachers' perceived planning and evaluations of e-teaching are insufficient; meaning they may lack knowledge in two scales, namely, "computer self-efficacy" and "continuous use of e-teaching", and any effects between the two would be limited.
3. Scoring according to scales is based on teachers' self-evaluations; therefore, this study cannot eliminate samples that were influenced by situations, attitudes, emotions, or are seemingly unmatched with reality. Although the use of self-reports to collect data has its benefits, it may lead to a common method variance, namely, a situation that may inflate the true associations between variables.
4. This study aims to probe into the factors of technological and vocational school teachers' continuous use of e-teaching, which is significantly affected by students' feedback regarding learning outcomes. Future studies can include measurements of this variable, and modify the model in order to further probe into the cause-and-effect relations among the variables.

IMPLICATIONS FOR PRACTICE

The findings of this study demonstrate that "resource support" and "innovative leadership" of technological and vocational school teachers' "organizational innovative climate" significantly influence "continuous use of e-teaching". E-teaching users' use intentions depend on their attitudes toward e-teaching. Workplace and organizational support will indirectly affect users' intentions to use e-systems (Igbaria, Guimaraes & Davis,1995; Karahanna & Straub, 1999). Administrators of technological and vocational schools should create an open and autonomic organizational innovative climate that encourage teachers to continually contemplate on innovative instructional approaches, and through supervisors' respect and resource support, energize teachers' active promotions of innovative ideas for e-teaching and continuous implementation.

Second, according to results of this study, technological and vocational school teachers' "organizational innovative climate" significantly influences "computer self-efficacy". In the Theory of Diffusion of Innovation, the process by which teachers perceive new things or concepts through communication channels and school organizations, usually require a long period of adjustment time to gain acceptance of teachers. Organizational innovative climate in schools will influence users' use intentions of information technology. After information technology is introduced within an organization, if it is supported by high-ranking supervisors, the users' use attitude and intention would be indirectly influenced by the increased use opportunities, and subsequent experience (Sorensen, Mathiasen, & Dalsgaard, 2009; Taylor & Todd, 1995). Therefore, the specific measures to enhance technological and vocational school teachers' computer self-efficacy are as follows: 1) technological and vocational schools should systematically cultivate teachers' computer information competency; 2) schools should host studies groups such as web page editing, file management, basic concepts of multimedia, internet concepts, acquisition of internet resources, and the use and control of computers in order to develop teachers' computer competency; and 3) schools should establish e-teaching environments, such as constructing a main engine of a server, a wireless network environment, and an information platform.

Finally, the findings of this study indicate that "ease of use" and "effectiveness" of "computer self-efficacy" can enhance teachers' continuous use of e-teaching. Besides computer knowledge and techniques, computer self-efficacy also includes teachers' attitudes toward computer technology, such as cognition, value, emotion, and motive (Anderson, Klassen & Johnson, 1981). When teachers have greater knowledge of information systems, they are more likely to have intentions to use the new technology. There are significant and positive correlations among computer knowledge and skills, and users' computer use and performance (Geissler & Horridge,1993; Kay,1993 ; Kwon & Zmud,1987; Thong,1999). Measures to enhance technological and vocational school teachers' continuous use of e-teaching are as follows: 1) allow teachers to perceive the importance and growing trends in e-learning through teacher studies and job promotions; 2) assist teachers' with e-teaching in order to integrate the courses and resources of e-teaching; 3) instruct teachers to reorganize current teaching resources into a self-introduced e-learning environment; and 4) plan e-teaching activities of encouragement in order to energize teachers enthusiasm to adopt information in teaching.

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Appendix
List of items used in this study

	Composition of scales	Items
Scale of organizational innovative climate	**Job autonomy**	1. I will constantly ponder on innovative teaching materials and approaches. 2. I will use multiple instructional approaches to develop students' multiple wisdom and creations. 3. I can actively promote instructional innovative ideas and attempt to implement them.
	Innovative leadership	4. Supervisors of the school have unique innovative ideas. 5. Communication channels of this school are varied. 6. Supervisors of the school respect and support my creations at work.
	Resource support	7. I have sufficient equipment for creative teaching. 8. As long as I am in need, professional staff will effectively assist me with creative teaching. 9. The school provides opportunities for creative teaching. 10. The school financially supports demands for innovative R&D.
	Innovative culture	11. Most teachers of the school are willing to encounter challenges. 12. The school climate stimulates teachers' innovative thoughts. 13. Members of the school can understand and accept innovative visions and goals.
	Group cohesion	14. The teams in our unit have clear and definite goals. 15. Co-workers of the school share common consensus. 16. Co-workers of the school support and help each other.
Computer self-efficacy	**Playfulness**	17. Computer-based instruction is more interesting. 18. Digital data is more likely to attract students. 19. E-teaching is more interesting.
	Ease of use	20. For me, the computer is easy to learn. 21. I can learn how to use computers by observing others. 22. It is not difficult to master computers.
	Effectiveness	23. E-teaching is more flexible. 24. E-teaching is more likely to increase students' learning motivations. 25. E-teaching is more likely to increase students' learning outcomes.
	Usefulness	26. It is more useful to make teaching materials by computers. 27. It is easier to assist with students' after-school learning by e-teaching. 28. It is easier to deal with digital teaching materials after learning computer skills.
Continuous use of e-teaching	**Goal identification**	29. Before e-teaching, I will create teaching plans in advance. 30. Before e-teaching, I will become familiar with the contents of different units. 31. Before e-teaching, I will prepare teaching materials and tools for different units. 32. In e-teaching, I will change instructional activities to maintain students' concentration. 33. I can select proper teaching media according to instructional subjects and teaching materials.
	Job achievement	34. After e-teaching, I will grade students by multiple evaluations. 35. After e-teaching, I will have discussions with students regarding their learning results and guide their future learning. 36. After e-teaching, I will adjust instructional schedules, degree of difficulty, and methods, according to evaluation outcomes.

		37. After e-teaching, I will collect supplementary teaching materials in order to enhance teaching efficacy.
		38. After e-teaching, I will enhance the operations of teaching media in order to enhance teaching activities.
	Flow experience	39. During e-teaching processes, I can create harmonious learning atmospheres.
		40. During e-teaching processes, I will value students' demands.
		41. During e-teaching processes, I will interact with students and share experiences.
		42. During e-teaching processes, I can maintain order in the class.
		43. During e-teaching processes, I will praise and encourage students' progress.