

Professional Acceptance and Attitudes Towards Adopting Computer Technology for English Teaching in Higher Education Environment

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Abstract

In recent years, teachers face an enormous challenge in adopting computer technology into the teaching and learning environment. These challenges are especially felt by individuals who have not used computer technology or who have a negative attitude of computer technology adoption. Gender and age may be two critical factors why teachers deny to learn computer skills. These factors would lower or influence teachers' attitudes toward computer technology adoption. Thus, it is important for researchers to identify and understand teachers' attitudes toward computer technologies, and awareness that may influence educators' decisions on adopting computer technology into teaching. Teachers' characteristics such as 1. gender, 2. age, 3. educational level, 4. years of teaching, 5. training, 6. access to computers and mode of delivery, 7. attitude, 8. self-efficacy, and 9. previous computer experience have been noted as factors that influence adoption of computer technology in teaching (Clark, 1993; Dillon & Walsh, 1992; Wolcott, 1993).

Key words: Adoption of computer technology, Expert, Novice.

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Purpose of This Study

The aim of this study is to explore the attitudes of English teacher of adopting computer technology in higher education

Definition of Terms

Adoption of computer technology. The combination of technology and traditional teaching procedures to facilitate student learning (Hannifin, Dalton, & Hooper 1987; Senese, 1984).

Expert. Someone with special knowledge, training, or competence (Longman, 1994).

Novice. A person without training or experience in a skill or subject (Longman, 1994).

Review of the Literature

Teachers' Attitudes Toward Computer Technology Adoption

Attitudes toward the adoption of computer technology consists of feelings and emotions. Teachers' attitudes toward computer technology impact what instructors learn about computers. Teachers who have a negative attitude, computer anxiety, or who may have had bad outcomes during training find it difficult to use computer technology in the classroom. On the other hand, teachers who possess positive attitudes toward computers and have self-efficacy in adopting computers are able to adapt to computer technology easily. Possessing a positive attitude is not the only key to adopting computer technology into teaching successfully. Hands-on experience in computer technology is one of the other keys to reaching success.

Attitude is the *critical juncture* element; it determines the failure or success of the adoption of

computer technology in teaching. Moreover, there were different attitudes toward computer technology between experienced teachers and inexperienced teachers. The more experienced the teachers were with computers, the higher the chances that they would be willing to adopt computer technology into teaching (Hardy, 1998; Laffey & Musser, 1998). In general, teachers were more willing to use computer technology in their teaching when they have a positive attitude toward computers and have more computer experience.

Teachers are concerned about the lack of support they need in order to adopt computer technology in their teaching. When teachers feel anxious and are concerned about support, their willingness to adopt computer technology is likely to decrease.

Cuban (1986) stressed that on some level, computer technology had been resisted by teachers at all levels of the educational system. Teachers normally resent learning new technologies that schools impose on them without being consulted (Cuban, 1986). Damanpour and Evan (1984) and Kraemer and King (1986) noted that teachers will either embrace computer technology or resist it. It is likely that school decision makers expect that instructors will adopt computer technology just because it is perceived to be beneficial in improving teaching.

Imposing pressure on teachers to adopt computer technology did not increase the possibility of successful computer technology use; teachers who already feared computer technologies might become even more reluctant to adopt them if they felt it was imposed on them (Giannelli, 1985; Willis, 1993).

Computer technology adoption changed one's position from being the traditional "sage on the stage" to also being a "guide on the side," and students would change their role of passive learners to becoming full participants in the learning process (Alley, 1996). In addition, many teachers believed the adoption of computer technology would create new methods of achieving tasks and support new teaching strategies and skills that students needed to learn (Kearsley, Hunter, & Furlong, 1992).

Teachers' Computer Abilities

Moore, Knuth, Borse, and Mitchell (1999) stated that if teachers had the ability to use new computer technologies, then they were more likely to apply technologies in their teaching. If teachers felt inadequate using computer technology, then they tended not to be interested in using it

(Macmillan, Liu, & Timmons, 1997).

Barriers

It was a worldwide issue that teachers had faced barriers in their attempts to implement and adopt computer technology into their teaching (Leggett & Persichitte, 1998). Hope (1998) identified five additional barriers that could affect success in adopting computer technology into teaching methods: 1. lack of a clear idea of how computer technology can assist in teaching, 2. inability to identify the barriers to be addressed by computer technology adoption, 3. lack of access to the resources that teachers want to adopt into their teaching, 4. inability to find agents who can articulate what the beneficial computer technology accomplishes over what teachers presently do to complete their task, and 5. inability to identify teachers' interests in other pedagogies that could fulfill teaching goals.

Other investigations have shown that the lack of time for professional computer technology training and the lack of opportunities to interact with other high-tech teachers are major obstacles which can affect computer technology adoption in teaching (Bradshaw, 1997; Meltzer & Sherman, 1997). Charp (1996) found that teachers needed computers, hardware, software knowledge, confidence, and computer skills to overcome computer barriers. Teachers also needed time to attend computer training programs, computer technology conferences, and meetings. They needed time to interact with teachers who had high-tech abilities. Lack of knowledge and insufficient training among teachers had been determined to be two major obstacles in computer adoption (Reinen & Plomp, 1993).

O'Donnell (1996) conducted a study on the adoption of computers in the classroom. The outcome of the study was that most of the teachers were not successfully using computers during direct classroom instruction. Moreover, the results showed that teachers did not know how to use computer technology to facilitate their teaching. Teachers failed to use software and also failed to redesign their class instruction to combine technologies in teaching. From O'Donnell's research, the need to understand teachers' willing and the extent of their desire for computer training in the future are certain.

In addition, computer technology adoption had to focus on the needs of teachers (Meltzer & Sherman, 1997). Computer technology development must assess teachers progress and their

continuing needs, particularly needs related to identifying factors which affect teacher use of computer technology. Without this information, computer technology adoption by teachers will proceed on precarious grounds.

Adoption

In order to successfully adopt computer technology into teaching, decision makers must consider factors that affect teacher decisions to use or not to use computer technology. Sheingold and Hadley (1990) reported in a survey of teachers who chose to adopt computer technology that these teachers spent extra time attending computer training classes and learned how to adopt computer technology into their teaching. A similar study reported that several other teachers had to spend extra time to learn computer skills (Zammit, 1992). According to Zammit (1992), "adequate funding can give educators both the opportunity and time to practice, learn, and access the options offered by the fast changing computer technology" (p. 65).

Characteristics That Affect Computer Technology Adoption

Personal characteristics can influence teachers' use of computer technology in the academic and learning environment. Gender differences, computer experience, and teacher rank have been identified in several studies as having an influence on teachers' willingness to adopt computer technology (Leah, 1998). Busch (1995), in a study of gender differences concerning self-efficacy and attitudes toward computer technologies, reported that male learners experienced significantly less computer anxiety and higher computer self-efficacy than female learners toward complex computing tasks.

In a study of teachers use of instructional computer technology in higher education, Spotts and Bowman (1995) reported a significant difference between males and females with regard to the use of older technologies (such as audio, film, and video). Female teachers rated their computer technology experience lower than their male colleagues while using newer computer technology (such as multimedia, distance learning, e-mail, and presentation software). Male teachers rated their computer technology experience higher than did female colleagues. Based on these findings, gender is considered an important characteristic of computers.

Method

The aim of this study was to explore how does the teachers' attitude towards adoption of computer technology in higher education. In order to address the issues posed in this study, it was necessary to investigate teachers' attitudes and beliefs toward adopting computer technology into instructional practice. An ex post facto research design was used in this study. The purpose of using ex post facto research was to enhance control and limit plausible rival hypotheses (McMillan & Schumacher, 1997).

Instrumentation

The questionnaire used in this study was Attitudes toward Computer Technologies (ACT), scales (Kinzie, Delcourt, & Powers, 1994). The ACT scale contains 19 items related to perceived usefulness of and comfort/anxiety with computer technologies. The ACT scale uses a 4-point Likert response format ranging from 1.= *strongly disagree*, 2. = *slightly disagree*, 3. = *slightly agree*, to 4.= *strongly agree*. These 19 items were used to assess the perceived usefulness of and comfort or anxiety with computer technologies (Kinzie et al., 1994).

Results

The purpose of this study was to explore how does the teachers' attitude towards adoption of computer technology in higher education. The data collected in this study were analyzed to answer the research question using the statistical analysis software. The alpha level was set at the .05 level of significance. The linear regression analysis was used to analyze data. All responses to negatively stated survey questions were recoded to correspond to a positively stated question.

Participants ($N = 26$) completed a demographic questionnaire, including questions about age, educational degree, rank, tenure status, and years of college/university teaching experience. These participants came from two departments in one college, including 18 teachers from Department of

Foreign Language, and 8 from General education. The respondents' age ranged between 31 and 62. Of the 26 teachers, 7 were male and 19 were female. Five teachers held the doctoral degree, 21 held the master's degree.

In Table 1, the mean score of attitude is 3.59, indicating that the number of novices was greater than the number of experts. The mean score for computer technology adoption is 5.05, indicating that most of the respondents selected the answer *most confident*.

Table 1 Means and Standard Deviations of Attitude, and Computer Technology Adoption Scores ($N = 26$)

Variable	<i>M</i>	<i>SD</i>
Attitude	3.59	0.47
Computer technology adoption	5.05	0.69

Note: Maximum score for attitude is 1, for computer technology adoption is 4.

The analyses of the data showed that the teachers' attitude was positively correlated with computer technology adoption. The results indicated that the more computer experienced teachers tended to adopt computer technology into their teaching than their less computer experienced colleagues. Findings also revealed that teachers who lacked of computer technology experience and low degree of computer self-efficacy might be less likely to adopt those skills into their curriculum.

The null hypothesis states that there was no statistically significant relationship between attitude and computer technology adoption. Based on current data analysis, the null hypothesis was rejected. This finding indicates that there is a statistically significant relationship between teachers' attitude and computer technology adoption. In Table 2, a β of .39, indicating a positive weak relationship between attitude and computer technology adoption, was found. Further analysis showed this weak relationship to be significant.

In Table 2 the unstandardized regression coefficient (*B*) for attitude is reported as .64. In addition, the results of the t test of the regression coefficient (*B*) indicated a significant t value of 3.95 ($p < .001$). A constant value of 2.79 is reported in Table 2 Using this constant value with the unstandardized regression coefficient (*B*), predictions can be made using the following equation:

$$\text{Computer technology adoption} = .64 \times (\text{attitude}) + 2.79.$$

The contribution of attitude to the prediction of computer technology adoption is statistically

significant. Thus, the level of computer technology adoption can be predicted by attitude.

Table 2 Summary of Regression Analysis for Coefficients of Attitude and Computer Technology Adoption Scores

Variable	<i>B</i>	<i>SEB</i>	β	<i>t</i>
Constant	2.79	-.59	—	4.75***
Attitude	0.64	.16	.39	3.95***

Note. Dependent variable: computer technology adoption. Dash indicates no calculation.

*** $p < .001$.

The results of the ANOVA are presented in Table 3. The F test indicated a significant value of 15.63 ($p < .001$). The amount of variance in computer technology adoption explained by attitude was statistically significant. This means that 15% (R^2) of the variance in computer technology adoption can be explained by knowing the results for attitude (see Table 4).

Table 3 ANOVA of the Regression Analysis by Attitude and Computer technology Adoption

Source	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>
Regression	1	8.29	8.29	15.63***
Residual	90	47.71	0.53	
Total	91	56.00		

*** $p < .001$.

Table 4 Summary of Regression Model by Attitude and Computer Technology Adoption

Model	<i>R</i>	R^2	<i>Adjusted R²</i>	Std.Error of the Estimate
Attitude and computer technology adoption	.39	.15	.14	.73

Note. Independent: Attitude; Dependent variable: Computer Technology Adoption.

Finding and Discussion

The purpose of this study was to provide a conceptual framework for computer technology integrators in Taiwan to help formulate how does teachers' attitude influences computer technology adoption in their teaching. In addition, the outcome of this study may also help teachers in the adoption of appropriate strategies with computer technology adoption in higher education.

The current findings indicated that computer technology adoption was positively correlated with attitude. The data also showed that the F test indicated a significant value of 15.63 ($p < .001$) and an R value of .39; this suggested a weak but statistically significant relationship between attitude and computer technology adoption. In several prior studies, researchers had reported that attitude is significantly related to the adoption of computers for teaching (Faseyitan, Libii, & Hirschbuhl 1996; Olivier & Shapiro, 1993). The level of computer technology adoption is dependent on the self-perception of attitude. The current findings indicate, the willingness of adopting computer technology is influenced by the level of attitude. In other words, teachers who possess positive of attitude have no problems adopting computer technology into class work, but teachers with negative attitude will face difficulties.

Moreover, Faseyitan et al. (1996) indicated in their study on attitude among teachers that who possessed negative attitude tended not to adopt computer technology even though computer equipment such as hardware and software, was available to them. On the other hand, those teachers who possess positive attitudes do show a high interest in developing innovative educational uses for computers. These prior findings and outcomes were based on the review of previous research and were confirmed by the findings of the current study.

In summary, the answer to this question was as expected. Teachers' attitude has been a good predictor of behavior; that is, teachers with positive attitude tend to accept innovative change. On the other hand, teachers with negative attitude will resist technological change and, instead, behave more traditionally. This might be due to feelings of inadequacy about innovation (Olivier & Shapiro, 1993).

Recommendations

Recommendations for further research are listed below.

1. Replicate the study by using a larger sample size to support the interpretation of the data collected from the limited number of participants in this study.
2. Replicate the study with additional measurement instruments. Measures should be used other than self-report instruments. For example, qualitative analysis methods might be employed to examine the relationships among teachers' attitude, and computer technology adoption. Such approaches might include observations, interviews, and ethnographic research techniques.
3. Replicate the study with a diverse population of teachers with more than one school to exam whether the findings are different to the outcomes of the current study.

Limitation

There were several limitations that might have influenced the results of this study including instrument measurement, and geography. This study was accurate only to the degree that the participants' self-perceptions were answered honestly. Geographically, it was limited to a single school. This might limit the generalizability of the results to other academic settings and population.

References

- Alley, L. R. (1996). Technology precipitates reflective teaching: An instructional epiphany. *Change*, 28(2), 49-54.
- Bradshaw, L. K. (1997). Technology-supported change: A staff development opportunity. *NAASP Bulletin*, 1, 86-92.
- Busch, T. (1995). Gender differences in self-efficacy and attitudes towards computers. *Journal of Educational Computing Research*, 12, 147-158.
- Charp, S. (1996). Curriculum integration. *Technological Horizons in Education Journal*, 23(10), 4.
- Clark, T. (1993). Attitudes of higher education faculty toward distance education: A national survey. *The American Journal of Distance Education*, 7(2), 19-33.
- Cuban, L. (1986). *Teachers and machines: The classroom use of technology since 1920*. New York: Teachers College Press.
- Damanpour, F., & Evan, W. (1984). Organizational innovations and performance: The problems of organizational lag. *Administrative Science Quarterly*, 29, 392-409.
- Dillon, C., & Walsh, S. M. (1992). Faculty: The neglected resource in distance education. *The American Journal of Distance Education*, 6(3), 5-21
- Faseyitan, S., Libii, N., & Hirschbuhl, J. (1996). An in-service model for enhancing faculty computer self-efficacy. *British Journal of Educational Technology*, 27, 214-226.
- Giannelli, G. (1985). Promoting computer use in the classroom: The teacher is always the last to know. *Educational Technology*, 25(4), 30-31.
- Hannifin, M. H., Dalton, D. W., & Hooper, S. (1987). Computers in education: Ten myths and ten needs. *Educational Technology*, 27(2), 8-14.
- Hardy, J. V. (1998). Teacher attitudes toward technology of computer technology. *Computer in the schools*, 14, 119-136.
- Hope, W. C. (1998). The next step: Integrating computers and related technologies into practice. *Contemporary Education*, 69, 137-140.

- Kearsley, G. B., Hunter, S., & Furlong, M. (1992). *We teach technology: New visions for education*. Wilsonville, Or.: Franklin, Beedle and Associates.
- Kinzie, M., Delcourt, A., & Powers, M. (1994). Computer technologies: Attitudes and self-efficacy across undergraduate disciplines. *Research in Higher Education, 35*, 745-768.
- Kraemer, K., & King, J. (1986). Computing and public organizations. *Public Administration Review, 6*, 488-495.
- Laffey, J., & Musser, D. (1998). Attitudes of pre-service teachers about using technology in teaching. *Journal of Technology and Teacher Education, 6*, 223-241.
- Leah, K. K. (1998). Faculty computer self-efficacy (Doctoral dissertation, Iowa State University, 1998). *Dissertation Abstracts International, 59*, 4077.
- Leggett, W. P., & Persichitte, K. A. (1998). Blood, sweet, and tears: 50 years of technology implementation obstacles. *Techtrends, 43*(3), 33-36.
- Longman Group UK Limited (1994). *Longman English-Chinese dictionary of contemporary English*: Hong Kong; Longman Asia Limited.
- Macmillan, R. B., Liu, X., & Timmons, V. (1997). Teachers, computers and the Internet: The first stage of community initiated project for the integration of technology into the curriculum. *Alberta Journal of Educational research, 43*, 222-234.
- McMillan, H. J., & Schumacher, S. (1997). *Research in education: A conceptual introduction* (4th ed.). New York: Addison-Wesley Educational.
- Meltzer, J., & Sherman, T. M. (1997). Ten commandments for successful technology implementation and staff development. *NASSP Bulletin, 81*, 23-31.
- Moore, J., Knuth, R., Borse, J., & Mitchell, M. (1999, March). *Teacher technology competencies: Early indicators and benchmarks*. Society for Information Technology & Teacher Education International Conference, San Antonio, TX.
- O'Donnell, E. (1996). *Integrating computers into the classroom: The missing key*. Lanham, MD: Scarecrow Press.
- Olivier, T., & Shapiro, F. (1993). Self-efficacy and computers. *Journal of Computer-Based Instruction, 20*, 81-85.
- Reinen, I. J., & Plomp, T. (1993). Staff development as a condition for computer integration. *Education Evaluation, 19*, 149-166.

- Senese, D. J. (1984). *Instructional technology: Realizing the potential*. Logan, UT: Association for Educational Communications and Technology.
- Sheingold, K., & Hadley, M. (1990). *Accomplished teachers: Integrating computers into classroom practice*. New York: Bank Street College of Education, Center for Technology in Education.
- Spotts, T. H., & Bowman, M. A. (1995). More than fiber: Distance education in Iowa. *Tech Trends*, 40(3), 13-15.
- Willis, J. (1993). What conditions encourage technology use? It depends on the context. *Computers in Schools*, 9(4), 13-34.
- Wolcott, L. L. (1993). Faculty planning for distance teaching. *The American Journal of Distance Education*, 7(1), 26-36.
- Zammit, S. (1992). Factors facilitating or hindering the use of computers in schools. *Educational Research*, 34(1), 57-66.

技職體系英文教師對於使用電腦於 教學上之態度及接受度之探討

王志峯

摘要

近年來，教師面臨了如何將電腦科技帶入他們的教學環境中的巨大挑戰。特別是那些從來沒有使用過電腦或是對電腦科技持有負面印象的教師們特別感到惶恐。性別及年齡可能是造成他們不願接受此一趨勢的兩大主因。此外，研究者必須要了解教師對採用電腦科技在語言教學上的態度。教師的個人因素，例如：性別、年齡、教育程度、教學年資、在職進修、電腦熟悉度、態度、自我效能和先前的電腦經驗被認為是影響教師使用電腦科技於教學上的各項主因（Clark, 1993; Dillon & Walsh, 1992; Wolcott, 1993）。

關鍵詞：電腦科技之採用、專家、新手。