PERCEIVED SOCIAL SUPPORTS, COMPUTER SELF-EFFICACY, AND COMPUTER USE AMONG HIGH SCHOOL STUDENTS

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ABSTRACT
This study investigated the function of social supports and computer self-efficacy in predicting high school students' perceived effect of computer use. The study was survey method to collect data. The questionnaires were distributed to the high school students in Taiwan. 620 questionnaires were distributed and 525 questionnaires were gathered back with 84.67% return rate. The results of structural equation modeling (SEM) and model invariance analysis indicate that perceived peer support played an important role in predicting the effects of advanced computer self-efficacy. However, general computer self-efficacy was the factor more strongly associated with student computer use. The results were analyzed to provide useful insight into the development of student computer competency. The modified scale was a valid and reliable instrument for large scale population. This study provided representative results for further related studies. Educational implications and suggestions for future research are proposed.
Keywords: perceived social supports, computer self-efficacy, computer use

INTRODUCTION

The rapid change of computer technology has transformed into an important part of our lives. Computers and Internet access are becoming increasingly common in schools. Although originally intended as a means to provide individualized instruction for students, computers and Internet support collaborative learning in the classroom (Littleton & Light, 1999). However, the computer has captured the attention of educators and the academic community, and technology use is becoming increasingly important. The prevalent use of computers in education may provide learners more opportunities for web-based learning (Engelbrecht, 2005). Computers and the Internet have become important tools in our daily life, as well as useful tools for social psychological research (Imhof, Vollmeyer, & Beierlein, 2007; Kao & Tsai, 2009; Topkaya, 2010; Vekiri & Chronaki, 2008).

Researchers and practitioners have focused on psychological and social factors that may influence learner computer use. Studies over the past decade have found that psychological factors influence individual computer use (Barbeite & Weiss, 2004; Compeau & Higgins, 1995; Hsu, Wand & Chiu, 2009; Kao & Tsai, 2009). However, comparatively few studies have examined social factors linked to computers (Chu, 2010; Schepers, Jong, Wetzels & Ruyter, 2008; Vekiri & Chronaki, 2008). The social support theory discusses the various sources of positive or protective influences associated with individual social relationships and networks (Berkman, Glass, Brissette, & Seeman, 2000). The present study considered the influence of family support and peer support on students' computer learning based on the theory of social support. Vekiri and Chronaki (2008) categorized various forms of support as parental and peer support. Gonzalez-DeHass, Willes, and Holbein (2005) indicated that when parents pay more attention to school-related and extracurricular activities, provide encouragement and praise, and express positive values and expectations, children have positive self-efficacy beliefs and intrinsic motivation for school learning.

The self-efficacy theory derives from the social cognitive theory (Bandura, 1986), which significantly influences many areas. Computer self-efficacy refers to beliefs in one's capabilities to use the computer (Compeau & Higgins, 1995). This study also explored social factors related to computer self-efficacy. Computer self-efficacy has been identified as an important determinant of computer-related tasks and computer usage (Hassan, 2003). Previous research suggests that computer self-efficacy has been shown to play a significant role in an individual's decision to use computers (Marakas, Yi, & Johnson, 1998; Ong, Lai, & Wang, 2004).

Previous research on computer self-efficacy indicated that computer experience had a significant positive relationship on computer self-efficacy beliefs (Potosky, 2002). Computer self-efficacy refers to individual self-efficacy about using computers (Murphy, Coover, & Owen, 1989), and has been identified as a major determinant of computer-related ability and usage in organizational contexts (Madhavan & Phillips, 2010). However, several previous studies have examined factors affecting computer self-efficacy beliefs (Busch, 1995; Harrison & Rainer, 1992; Hassan, 2003; Potosky, 2002). Computer self-efficacy may determine the success of computer learning. In other words, the social cognitive theory provides a solid theoretical foundation for the concept of computer self-efficacy. In other studies, computer self-efficacy has a significant positive relationship with enhanced higher performance (Compeau & Higgins, 1995), and increased computer usage (Compeau, Higgins, & Huff, 1999).

PURPOSE OF THE STUDY

In this study, it is aimed to identify the effect of different types of social supports (Perceived Family Support, PFS vs. Perceived Peer Support, PPS) and Computer Self-efficacies (General Computer Self-efficacy, GCSE vs. Advanced Computer Self-efficacy, ACSE) on Computer Use (CU). The purposes of this study are:

(a) To identify the effect of different types of Social Support and Computer Self-efficacies on high school students' perceptions of the effects of Computer Use.
(b) To understand the relationship among Social Support, Computer Self-efficacy, and Computer Use.

Figure 1 illustrates the model developed for this purpose.

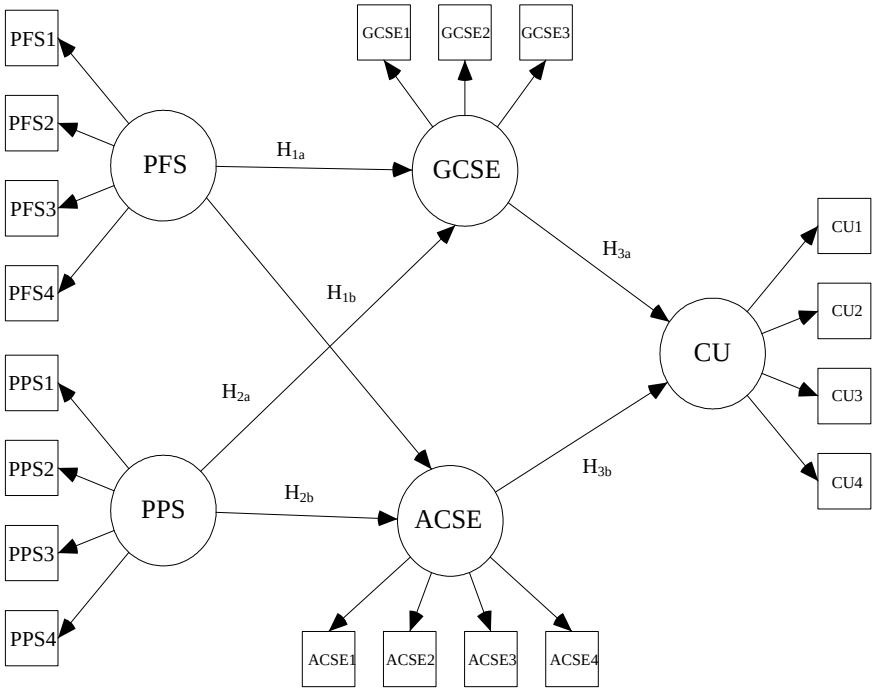

Figure 1: The Research Model

LITERATURE REVIEW

Perceived Family Support and Computer Self-efficacy

Some studies have separated social support into parental and peer support (Vekiri & Chronaki 2008). Family support reflects personal beliefs about sufficient resources when approaching new technology (Thather, Loughry, Lim, & McKnight, 2007). Several studies have demonstrated the effect of family support on computers and computer self-efficacy, while studies have examined the relationship between family support on computer and computer self-efficacy (Chu, 2010; Chu & Chu, 2010; Schepers, Jong Wetzels & Ruyter, 2008; Vekiri & Chronaki, 2008). These studies have found family support to be the strongest predictor of computer self-efficacy. Barbeite and Weiss (2004) distinguished between general computer self-efficacy and advanced computer self-efficacy. Previous studies have found that individuals with advanced levels of computer self-efficacy are more likely to possess higher computer self-efficacy than individuals at beginning levels (Barbeite & Weiss,

2004; Harrison & Rainer, 1992; Torkzadeh & Van dyke, 2001). From the discussion above, the following hypotheses are proposed:

H_{1a}: Perceived family support is positively associated with general computer self-efficacy.
H_{1b}: Perceived family support is positively associated with advanced computer self-efficacy.

Perceived Peer Support and Computer Self-efficacy

Social influence has been proved to be an important factor that affects attitude or behavior intention. The relative influence of peer supports typically increases the use of technology (Thatcher, Loughry, Lim, & McKnight, 2007). Martins and Kellermanns (2004) found peer encouragement to positively associate with learner satisfaction and perceived usefulness of a web-based course management system. Peer supports can provide help with the further social and academic competencies (Wentzel, Battle, Russell, & Looney, 2010). Classmates themselves can support each other with important information by modeling social and academic competencies (Schunk, 1987). With regard to self-efficacy for academic and social tasks (Bandura, 1986) are more likely to be influenced by teacher and peer supports and in turn, directly influence student outcomes (Wentzel, et al., 2010). However, peer support has been less investigated, although it may exert a strong influence on attitudes toward learning and schooling in young people (Wentzel, 1998; Zhao, Lu, Wang & Huang, 2011). Subsequently, two further hypotheses are as follows:

H_{2a}: Perceived peer support is positively associated with general computer self-efficacy.
H_{2b}: Perceived peer support is positively associated with advanced computer self-efficacy.

Computer Self-efficacy Mediates Social Support and Computer Use

Support leads to behavior change, and research has suggested that an effective way of improving the association of support and behavior is to increase individual self-efficacy (Rosland et al., 2008). Perceived self-efficacy is related to superior performance, which may moderate the influence of computer use (Chu, 2010). Computer self-efficacy has been shown to have a strong, positive relationship on performance during computer training (Webster & Martocchio, 1992). Computer self-efficacy plays a key role in system use and helps people more easily acquire many skills associated with effective computer use (Markas, Gavanagh & Gega, 1998). People with higher levels of personal computer self-efficacy demonstrate higher levels of aptitude and confidence when using a computer, and are therefore likely to find using a computer easier and more efficient than their counterparts (Agarwal, Sambamurthy, & Stair, 2000; Venkatesh, 2000; Venkatesh & Davis, 1996). Several studies have indicated the association between computer self-efficacy and user attitudes toward computers (Hsu, Wang, & Chiu, 2009; Smarkola, 2008; Zhang & Espinoza, 1998). Therefore, the following hypotheses can be proposed:

H_{3a}: General computer self-efficacy mediates perceived family support and computer use.
H_{3b}: General computer self-efficacy mediates perceived peer support and computer use.

METHOD

Participants

Data gathered from the questionnaire were analyzed under the following five sections of student background: gender, grade level, parental encouragement toward computer use, hours of computer use per week, and hours of Internet use per week. Table 1 indicates the demographic profile of the participants, consisting of 47% male, and 53% female students. Of the respondents, 30.3% were 10th Grade students, 35.4% were 11th Grade, and 34.3% were 12th Grade in high schools. More than 55.4% of parents encouraged their children to use the computer. Over 78.7% of the respondents used computers less than five hours per week. Over 56% of the respondents used the Internet less than five hours per week.

Table 1 Profile of respondents

Demographic profile	Frequency	Percentage
Gender		
Male	247	47%
Female	278	53%
Total	525	100%
Grade		
10th Grade	159	30.3%
11th Grade	186	35.4%
12th Grade	180	34.3%

Demographic profile	Frequency	Percentage
Total	525	100%
Parental encouragement toward computer use		
Yes	234	44.5%
No	291	55.4%
Total	525	100%
Hours of computer use per week		
Under 5	413	78.7%
6-10	61	11.6%
11-15	20	3.8%
16-20	8	1.8%
21 and above	23	4.4%
Total	525	100%
Hours of Internet use per week		
Under 5	294	56.0%
6-10	124	23.6%
11-15	48	9.1%
16-20	22	4.2%
21 and above	37	7.0%
Total	525	100%

n=525

Procedures

To develop a valid and reliable questionnaire, this study formulated several items, based on related literature and previous research. Students completed the questionnaire in their regular classrooms. Each student completed a self-report questionnaire that included two sections. The first section involved demographic information. The second section consisted of five items pertaining to the Perceived Family Support Scale, five items concerning the Perceived Peer Support Scale, five items relating to the General Computer Self-efficacy Scale, five items relating to the Advanced Computer Self-efficacy Scale, and five items regarding the Computer Use Scale. All items followed 7-point Likert-type scale. The second section contained 25 items. The average response time lasted approximately 25-30 minutes.

Measures

Perceived social supports

This study categorized social supports for using computers into two dimensions: perceived family support and perceived peer support. The perception scales of family and peer influence for using computers, implemented in this study, were developed by Vekiri and Chronaki (2008). The sample question in the perception of family support included "My parents encourage me to use computers," and "My parents think that computer proficiency is useful for my future." The Cronbach'a alpha reflected a good level of internal consistency (α= .91). Sample items in the perception of peer support included "My friends are interested in computers," and "When my friends and I get together, we enjoy doing things on the computer." Internal consistency was measured with Cronbach's alpha (α= .84). All items were rated using a 7-point scale ranging from 1 (strongly disagree) to 7 (strongly agree).

Computer self-efficacy

The Computer Self-efficacy Scale implemented in this study was developed by Barbeite and Weiss (2004), consisting of nine items, each followed by a 7-point response scale ranging from 1 (strongly disagree) to 7 (strongly agree). Computer self-efficacy was also divided into two levels of computer experiences: general and advanced. Four of the items measured general computer self-efficacy (GCSE), such as the basic computer and Internet skills (e.g., "I feel confident making selections from an on screen menu"). The reliability of GCSE was measured with Cronbach's alpha (α= .83). Another four items asked about advanced computer self-efficacy (ACSE), and assessing student confidence in learning advanced skills from the computer and Internet (e.g., "I feel confident about troubleshooting computer problems"). The reliability of ACSE was measured with Cronbach's alpha (α= .85).

Computer use

The Computer Use Scale implemented in this study was developed based on several relevant students (Chu, 2010; Hsu, Wang, & Chiu, 2009; Madhavan & Phillips 2010; Vekiri & Chronaki, 2008). All items using a

7-point Likert-type scale was developed to assess student computer use. The questions were rated on a 7-point scale with scoring from 1 (strongly disagree) to 7 (strongly agree). The Cronbach alpha reflected a good level of internal consistency (α= .86).

Data Analysis

The data were analyzed using descriptive statistics, the Pearson correlation coefficients, and structural equation modeling. Descriptive statistics were used to describe and summarize the properties of the accumulated data collected from respondents. Correlation analysis was then used to find the relationship between perceived social supports, computer self-efficacy, and computer use. Structural equation modeling was used to test the model.

RESULTS

Development of Instruments

To develop an effective survey, 25 items relevant to the five constructs of the proposed research model were adopted from existing literature and refined based on the specific topic of this study. These items were pilot-tested with 150 students from various high schools to examine internal consistency and reliability using the Cronbach alpha coefficient analysis. An overall Cronbach's alpha coefficient of all the items of a construct greater than 0.7, considers the items highly reliable (Kanna & Tan, 2005).

The questionnaire was further modified and refined based on pilot test results. The final questionnaire consisted of 19 items to assess the five constructs of the proposed research model. Items included in the final revised questionnaire were considered highly reliable if the individual Cronbach's alpha coefficients of the five constructs were all greater than 0.7 (see Table 2). Items in this study were measured using a 7-point Likert scale ranging from (1) strongly disagrees to (7) strongly agree. In addition, six other items were removed from the study due to the factor loading values less than 0.4.

To assess internal consistency, an estimate of composite reliability offered a useful measure for overall test reliability. According to Bagozzi and Yi (1988), a composite reliability of at least .60 is considered desirable. The reliability estimates ranged from .80 to .88, indicating acceptable reliability for the constructs. In addition, all items have significant t-value loading on their respective constructs ($p < .01$). The measure of average variance extracted (AVE) that is greater than .5 indicated acceptability (Fornell & Larcker, 1981). AVE extracted exceeded .5 (ranged from .5 to .68). Therefore, AVE and composite reliability also exceeded .5 and .6 thresholds, respectively, suggesting adequate measurement reliability.

Table 2 Cronbach's alpha coefficient of the constructs

Construct	Cronbach's α	Composite α	AVE	Number of item
1. Perceived parental support	.91	.80	.50	4
2. Perceived peer influence	.84	.87	.63	4
3. General computer self-efficacy	.83	.86	.68	3
4. Advanced computer self-efficacy	.85	.87	.62	4
5. Computer use	.86	.88	.65	4

Relationships between Family Support, Peer Support, Computer Self-efficacy, and Computer Use

Table 3 presents descriptive statistics for each of the constructs in the proposed research model. It indicates favorable perceptions of general computer self-efficacy in students and correlation coefficients among the questionnaire scales. The relationships between social supports, computer self-efficacy, and computer use indicated significant positive correlation of all the variables with each other. Perceived family support had significant and positive correlation with perceived peer support ($r = .18$, $p < .01$), general computer self-efficacy ($r = .19$, $p < .01$), advanced computer self-efficacy ($r = .27$, $p < .01$), and computer use ($r = .17$, $p < .01$). Perceived peer support had significant and positive correlation with general computer self-efficacy ($r = .33$, $p < .01$), advanced computer self-efficacy ($r = .36$, $p < .01$), and computer use ($r = .41$, $p < .01$). General computer self-efficacy had significant and strong correlation with advanced computer self-efficacy ($r = .56$, $p < .01$) and computer use ($r = .36$, $p < .01$). Advanced computer self-efficacy had significant and positive relationship with computer self-efficacy ($r = .30$, $p < .01$). These variables indicated significant correlation of many of the variables with each other, but were all less than .60.

Table 3 Correlation Analysis

Variables	M	SD	1	2	3	4
1. Perceived family support	4.06	1.04	—			
2. Perceived peer support	4.94	1.15	.18**	—		
3. General computer self-efficacy	5.88	1.07	.19**	.33**	—	
4. Advanced computer self-efficacy	4.08	1.31	.27**	.36**	.56**	—
5. Computer use	5.69	0.96	.17**	.41**	.36**	.30**

n=525, **p< .01

Confirmatory Factor Analysis

Measurement models

Results from confirmatory factor analysis demonstrated that all of the scales used in the study formed adequate measurement models and thus provided evidence for construct validity of the measures. Table 4 indicates the fit indices of the measurement models.

Table 4 Evaluation of measurement models for constructs used in the study

Variables	χ^2	df	p	NFI	CFI	GFI	AGFI
1. Perceived family support	6.843	2	< .01	.985	.989	.994	.968
2. Perceived peer support	1.745	2	.418	.998	1	.998	.992
3. General computer self-efficacy	6.189	2	.045	.996	.997	.994	.970
4. Advanced computer self-efficacy	33.966	2	< .01	.964	.965	.967	.836
5. Computer use	20.767	2	< .01	.983	.984	.981	.905

Structural models

This study used several fit indicators to assess the model: goodness-of-fit (GFI), adjusted goodness-of-fit index (AGFI), normed fit index (NFI) comparative fit index (CFI), and root mean square error of approximation (RMSEA) developed by Bentler (1990). The GFI, AGFI, NFI, and CFI approaches all exceed the recommended level of .9. The RMSEA indicates a fair fit if its value ranges between .05 and .08 (Browne & Cudeck, 1993). The ratio of chi-square to degrees of freedom is acceptable when the value is less than 5 (Kline, 2005). The model indicates an adequate fit between the hypothesized model and the observed data (χ^2=411.232, df=144, χ^2/df=2.856); GFI= .922, AGFI= .897, NFI= .914, CFI= .942, and RMSEA= .060) (Table 5). The results of AGFI exhibited a moderate but acceptable level of overall model fit, providing support to the validity of the structural model. Figure 2 illustrates the hypotheses supported with a solid line, along with their path estimates.

Table 5 Summary of Goodness-of-fit Indices

Fit Index	Recommended Level of Fit	Proposed Research Model
χ^2	n. s. at p < .05	411.232
χ^2/df	< 5	2.856
AGFI	> .90	.897
NFI	> .90	.914
CFI	> .90	.942
RMSEA	.05~ .08	.060

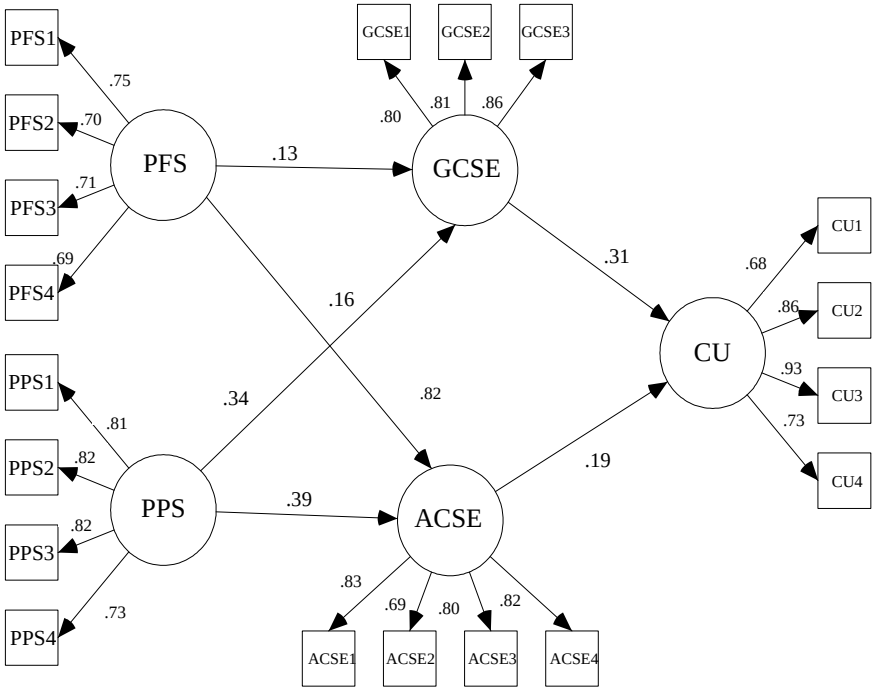

Fig. 2: Hypothesized model with path coefficients

Hypothesis testing

This study developed a conceptual model based on the literature of family support, peer support, general computer self-efficacy, advanced computer self-efficacy, and computer use. Six of the hypotheses drawn from this theoretical and empirical literature were supported. Table 6 illustrates the results.

Table 6 Results of hypotheses test

Hypothesis	Results
H_{1a}: Perceived family support is positively associated with general computer self-efficacy.	Supported
H_{1b}: Perceived family support is positively associated with advanced computer self-efficacy.	Supported
H_{2a}: Perceived peer support is positively associated with general computer self-efficacy.	Supported
H_{2b}: Perceived peer support is positively associated with advanced computer self-efficacy.	Supported
H_{3a}: General computer self-efficacy mediates perceived family support and computer use.	Supported
H_{3b}: General computer self-efficacy mediates perceived peer support and computer use.	Supported

DISCUSSION

From a practical perspective, the relationships among social supports (perceived family support vs. perceived peer support), computer self-efficacy (general computer self-efficacy vs. advanced computer self-efficacy), and computer use may provide a clue regarding how teachers can help their students use the computer effectively. This study contributes both theoretically and practically to the field of research. Theoretically, this study proposed a research model for empirical studies to link perceived family support, perceived peer support, general computer self-efficacy, advanced computer self-efficacy, and computer use. The results from structural equation modeling provide strong support for the hypothesized relations. The results of this study support key hypotheses drawn from the social cognitive theory of Bandura.

First, this study indicates that perceived family support and perceived peer support exert significant impact on computer self-efficacy. Perceived peer support plays a more important role than family support in predicting

computer self-efficacy. Peer support is the strongest predictor of advanced computer self-efficacy. The fact that mutually supportive relationships among students help them learn advanced computer skills might support this finding. However, perceived peer expectations for prosocial behavior may influence on their students' motivation to behave in socially competent ways (Wentzel, Filisetti, & Looney, 2007). Zhao et al. (2011) found that friends and classmates had an important personal influence on high school students. This result is consistent with previous studies (Chu, 2010; Vekiri & Chronaki, 2008) showing that perceived social support has a very strong influence on computer self-efficacy of students. A positive social environment in the classroom is related to computer self-efficacy beliefs of students. Students in a positive social environment tend to possess higher levels of computer self-efficacy. One possible implication from this result may be that peer support plays a particularly important role in improving student motivation to adopt various computer technologies. Thus, it is important to build peer support networks that will be a foundation for ongoing learning environment. The positive social relationships help to encourage more individuals to share knowledge (Teh, Chong, Yong, & Yew, 2010).

Second, this study indicates that general computer self-efficacy significantly influences computer use. The results of model fitness strongly support that general computer self-efficacy explains the level of student perception regarding their computer use. Teo (2009) investigated the relationship between computer self-efficacy and intended uses of technology. His sample consisted of 1,094 student teachers at a teacher training institute in Singapore. The results of his study found that student teachers' self-efficacy was a significant influence on the use of technology. That is, teachers' beliefs about computers has a significantly influence on computer usage. General computer self-efficacy plays a more important role than advanced computer self-efficacy. This result also indicates that general computer self-efficacy may equip students to better assess their computer ability. Prior research has also examined how computer self-efficacy affects computer usage (Fagan, Neill, and Wooldridge, 2003; Vekiri & Chronaki, 2008). This result is consistent with a previous study (Fagan, Eisenberg, Frazier, Stoddard, et al., 2003) that computer self-efficacy has a positive effect on computer usage. Computer self-efficacy is an important determinant in affecting individual's decision to use computer (Hill, Smith, & Mann, 1987). In addition, advanced computer self-efficacy also has significant influence on student computer use, possibly due to advanced computer self-efficacy as a component of user acceptance in advanced technology. Learners with better support and guidance during learning are more likely to adopt confidence while learning, and a positive attitude toward the Internet (Wu & Tsai, 2006). Student confidence in computer skills may affect their willingness to learn computer skills (Sam, Othman & Nordin, 2005). Therefore, computer self-efficacy is a greater predictor of computer usage than computer experience (Madhavan & Phillips, 2010).

CONCLUSIONS AND LIMITATION

This study investigated the relationship among different types of social supports, computer self-efficacy and the effects of computer use for high school students. The present study, however, makes several noteworthy contributions into how high school students alter their motivation factors, and it suggests a greater focus on helping students to effectively utilize information technologies for their academic and personal needs. This study found that perceived peer support played a main role in predicting the effects of computer use, mediated by general and advanced computer self-efficacy. This supports the finding of Vekiri and Chronaki (2008) that perceived peer support was the factors more strongly associated with boys' and girls' computer self-efficacy and value beliefs. Peer support enhances students' general and advance computer self-efficacy, and leads to better computer use. Therefore, peers have a strongly positive influence on each other and play important roles in their learning context.

This study has several limitations that suggest further possibilities for empirical studies. For this study, three limitations in particular should be noted. First, the data from this study were collected through self-reports, which may lead to a common method variance, a situation that may inflate the true associations between variables, resulting in spurious significant findings. Social desirability bias may have affected exit survey results (Podsakoff & Organ, 1986). In addition, data were collected from 525 high school students in Taiwan. All samples are from high school students, therefore the study results cannot be generalized to other samples. Future studies should attempt to increase the sample size and incorporate more high schools.

Furthermore, this study examined the relationship among various types of perceived family support, perceived peer support, general computer self-efficacy, advanced computer self-efficacy, and computer use for high school students, combined these data into one conceptual model, and then tested the related hypotheses using structural equation modeling. The findings of this study suggest that perceived peer support played a crucial role for computer usage of high school students, and the results partially support the hypotheses.

IMPLICATIONS AND FURTHER STUDIES

With regard to directions for future research, this study investigated the relationship of social supports and Computer self-efficacy. This study has implications for high school students regarding their computer learning and research. The results indicate that peer support plays an important role to enhance computer self-efficacy of students. Teachers should capitalize on peer support to achieve better performance in computer learning. This finding has implications for academia. More specifically, the practical results of this study imply that teachers should create a safe social environment for their students to enhance computer adoption. Consequently, this study also provides detailed directions for teachers by relating family support, peer support, computer self-efficacy, and computer use.

Future studies may aim at longitudinal research to test causal hypotheses regarding computer self-efficacy and other key factors involved in computer use. This study collected data solely from 525 college-bound high school students in Taiwan. Future studies may compare various types of schools (e.g. high schools vs. vocational high schools). This study is limited to the influence of advanced computer self-efficacy. Other factors possibly will influence student computer use besides those mentioned above. Future studies might focus on variables such as computer experience, computer attributes, computer-related performance, and learning styles. Future studies can also use qualitative methods to examine the mental process of learners.

ACKNOWLEDGMENT

This study was supported by the National Science Council, Taiwan, R.O.C., under Grant NSC 99-2511-S-230-001-MY3.

REFERENCES

Agarwal, R., Sambamurthy, V., & Stair, R. (2000). The evolving relationship between general and specific computer self efficacy: An empirical assessment. *Information Systems Research, 11*(4), 418-30.

Bagozzi, R. P., & Yi, Y. (1988). On the Evaluation of Structure Equations Models. *Academic of Marketing Science, 16*(3), 76-94.

Bandura, A. (1986). *Social Foundations of Thought and Action: A Social Cognitive Theory.* Englewood Cliffs, NJ: Pretice-Hall.

Barbeite, F. G., & Weiss, E. M. (2004). Computer self-efficacy and anxiety scales for an Internet sample: testing measurement equivalence of existing measures and development of new scales. *Computers in Human Behavior, 20*(1), 1-15.

Bentler, P. M. (1990). Comparative fit indexes in structural models. *Psychological Bulletin, 107*(2), 238-246.

Berkman, L. F., Glass, T., Brissette, I., & Seeman, T. E. (2000). From social integration to health: Durkheim in the new millennium. *Social Science and Medicine, 51*(6), 843-857.

Browne, M.W., & Cudeck, R. (1993). Alternative ways of assessing model fit. In K. A. Bollen & J. S. Long (Eds.), *Testing structural equation models* (pp. 136-162). Newbury Park, CA: Sage.

Busch, T. (1995). Gender difference in self-efficacy and attitudes toward computes. *Journal of Educational Computing Research, 12*(2), 147-158.

Chu, R. J. (2010). How family support and Internet self-efficacy influence the effects of e-learning among higher aged adults-Analyses of gender and age differences. *Computers & Education, 55*(1), 255-264.

Chu, R. J., & Chu, A. Z. (2010). Multi-level analysis of peer support, Internet self-efficacy and e-learning outcomes-The contextual effects of collectivism and group potency. *Computers & Education, 55*(1), 145-154.

Compeau, D. R., & Higgins, C. A. (1995). Application of social cognitive theory to training for computer skills. *Information Systems Research, 6*(2), 118-143.

Engelbrecht, E. (2005). Adapting to changing expectations: postgraduate students' experience of an e-learning tax program. *Computers & Education, 45*(2), 217-229.

Fagan, M. H., Neill, S., & Wooldridge, B. R. (2003). An empirical investigation into the relationship between computer self-efficacy, anxiety, experience, support and usage. *Journal of Computer Information Systems, 44*(2), 95-104.

Fagan, P., Eisenberg, M., Frazier, I., Stoddard, A. M., Vrunin, J. S., & Orensen, G. (2003). Employed adolescents and beliefs about self-efficacy to avoid smoking. *Addictive Behaviors, 28*(4), 613-626.

Fornell, C., & Larcker, D. (1981). Structural equation models with unobservable variables and measurement error. *Journal of Marketing Research, 18*(1), 39-50.

Gonzalez-DeHass, A. R., Willems, P. A., & Holbein, M. F. D. (2005). Examining the relationship between parental involvement and student motivation. *Educational Psychology Review, 17*(2), 95-119.

Harrison, A., & Rainer, K. (1992). The influence of individual differences on skills in end-user computing. *Journal of Management Information Systems, 9*(1), 93-111.

Hassan, B. (2003). The influence of specific computer experiences on computer self-efficacy beliefs. *Computers in Human Behavior, 19*(4), 443-450.
Hill, T., Smith, N. D., & Mann, M. F. (1987). Role of efficacy expectations in predicting the decision to use advanced technologies: The case of computers. *Journal of Applied Psychology, 72*(2), 307-313.
Hsu, M. K., Wang, S. W., & Chiu, K. K. (2009). Computer attitude, statistics anxiety and self-efficacy on statistical software adoption behavior: An empirical study of online MBA learners. *Computers in Human Behavior, 25*(2), 412-420.
Imhof, M., Vollmeyer, R., & Beierlein, C. (2007). Computer use and the gender gap: The issue of access, use, motivation, and performance. *Computers in Human Behavior, 23*(6), 2823-2837.
Kannan, V. R., & Tan, K. C. (2005). Just in time, total quality management, and supply chain management: understanding their linkages and impact on business performance. *Omega, 33*(2), 153-162.
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. *Computer & Education, 53*(1), 66-73.
Kline, R. B. (2005). *Principles and Practice of Structural Equation Modeling* (2nd ed.). New York, NY: Guilford Press.
Littleton, K. & Light, P. (Eds.). (1999). *Learning with Computers: Analyzing Productive Interactions*. New York, NY: Routledge.
Madhavan, P., & Phillips, R. R. (2010). Effects of computer self-efficacy and system reliability on user interaction with decision support systems. *Computers in Human Behavior, 26*(2), 199-204.
Marakas, G. M., Yi, M. Y., & Johnson, R. D. (1998). The multilevel and multifaceted character of computer self-efficacy: toward clarification of the construct and an integrative framework for research. *Information Systems Research, 9*(2), 126–163.
Martins, L. L., & Kellermanns, F. W. (2004). A model of business school students' acceptance of a web-based course management system. *Academy of Management Learning and Education, 3*(1), 7-26.
Murphy, C., Coover, D., & Owen, S. (1989). Development and validation of the computer self-efficacy scale. *Educational and Psychological Measurement, 49*(4), 893-899.
Ong, C. S., Lai, J. Y., & Wang, Y. S. (2004). Factors affecting engineers' acceptance of asynchronous e-learning systems in high-tech companies. *Information and Management, 41*(6), 795-804.
Podsakoff, P. M., & Organ, D. W. (1986). Self-reports in organizational research: Problems and prospects. *Journal of Management, 12*(4), 531-544.
Potosky, D. (2002). A field study of computer self-efficacy beliefs as an outcome of training: the role of computer playfulness, computer knowledge, and performance during training. *Computers in Human Behavior, 18*(3), 241-255.
Rosland, A., Kieffer, E., Israel, B., Cofield, M., Palmisano, G., Sinco, B., et al. (2008). When is social support important? The association of family support and professional support with specific diabetes self-management behaviors. *Journal of General Internal Medicine, 23*(12), 1992-1999.
Sam, H. K., Othman, A. E. A., & Nordin, Z. S. (2005). Computer self-efficacy, computer anxiety, and attitudes toward the Internet: A study among undergraduates in Unimas. *Educational Technology & Society, 8*(4), 205-219.
Schepers, J., de Jong, A., Wetzels, M., & de Ruyter, K. (2008). Psychological safety and social support in groupware adoption: A multi-level assessment in education. *Computers & Education, 51*(2), 757-775.
Schunk, D. H. (1987). Peer models and children's behavioral change. *Review of Educational Research, 57*(2), 149-174.
Smarkola, C. (2008). Efficacy of a planned behavior model: Beliefs that contribute to computer usage intentions of student teachers and experienced teachers. *Computers in Human Behavior, 24*(3), 1196-1215.
Teh, P. L., Chong, C. W., Yong, C. C., & Yew, S. Y. (2010). Internet self-efficacy, computer self-efficacy and cultural factors on knowledge sharing behavior. Af*rican Journal of Business Management, 4*(18), 4086-4095.
Teo, T. (2009). Examining the relationship between student teachers' self-efficacy beliefs and their intended uses of technology for teaching: A structural equation modelling approach. *Turkish Online Journal of Educational Technology, 8*(4), 7-15.
Thatcher, J. B., Loughry, M. L., Lim, J., & McKnight, D. H. (2007). Internet anxiety: an empirical study of the effects of personality, beliefs, and social support. *Information & Management, 44*(4), 353-363.
Topkaya, E. Z. (2010). Pre-service English language teachers' perceptions of computer self-efficacy and general self-efficacy. *The Turkish Online Journal of Educational Technology, 9*(1), 143-156.
Torkzadeh, G., & Van dyke, T. P. (2001). Development and validation of an Internet self-efficacy scale. *Behaviour and Information Technology, 20*(4), 2001, 275-280.
Vekiri, I., & Chronaki, A. (2008). Gender issues in technology use: Perceived social support, computer self-efficacy and value beliefs, and computer use beyond school. *Computer & Education, 51*(3), 1392-1404.

Venkatesh, V. (2000). Determinants of perceived ease of use: Integrating control, intrinsic motivation, and emotion into the technology acceptance model. *Information Systems Research, 11*(4), 342-365.

Venkatesh, V., & Davis, H. (1996). A model of the antecedents of perceived ease of use: Development and test. *Decision Sciences, 27*(3), 451-481.

Webster, J., & Martocchio, J. J. (1992). Microcomputer playfulness: Development of a measure with workplace implications. *MIS Quarterly, 16*(2), 201-226.

Wentzel, K. R. (1998). Parents' Aspirations for children's educational attainments: Relations to parental beliefs and social address variables. *Merrill-Palmer Quarterly, 44*(1), 20-37.

Wentzel, K. R., Battle, A., Russell, S. L., & Looney, L. B. (2010). Social supports from teachers and peers as predictors of academic and social motivation. *Contemporary Educational Psychology, 35*(3), 193-202.

Wentzel, K. R., Filisetti, L., & Looney, L. (2007). Adolescent prosocial behavior: The role of self-processes and contextual cues. *Child Development, 78*(3), 895-910.

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*(4), 441-450.

Zhang, Y., & Espinoza, S. (1998). Relationships among computer self-efficacy, attitudes toward computers, and desirability of learning computing skills. *Journal of Research on Computing in Education, 30*(4), 420-436.

Zhao, L., Lu, Y., Wang, B., & Huang, W. (2011). What makes them happy and curious online? An empirical study on high school students' Internet use from a self-determination theory perspective. *Computers & Education, 56*(2), 346-356.

