Faculty Instructional Computer Use Model: Differentiating Instructional and Mainstream Computer Uses

Ismail Sahin

Abstract

The purpose of this research study was to explore predictor variables for faculty instructional computer use. Analysis of data collected from 198 college of education (COE) faculty members indicated that instructional computer use and mainstream computer use form two strong and distinct variables. This study also proposes a faculty instructional computer use model that shows the relationships between these two types of computer uses and suggests different prediction paths for these two variables. While mainstream computer use was predicted significantly by personal computer access, collegial support, and mainstream computer expertise, instructional computer expertise and collegial support affect faculty attitudes toward instructional computer use. It is an important finding that collegial support is a motivation factor both to increase mainstream computer use and to change faculty attitudes positively toward instructional computer use. Finally, instructional computer skills, along with positive faculty attitudes toward computers as instructional tools, increase the likelihood of instructional computer use. The faculty instructional computer use model provides some key elements regarding how COE faculty use of instructional computer applications and software may be improved. Results from this study clearly suggest that faculty development programs should be focused upon instructional computer use and not on developing mainstream computer skills.

Increasing the use of instructional computer technologies (database and classroom management systems, Web-based interactive content, Website design software, simulations and games, discipline-specific programs, etc.) is one of the most challenging issues that higher education institutions and colleges of education face now. Although the benefits of using computers and technology in education are evident, and these technologies make faculty teaching and student learning more effective, faculty use of instructional technology varies notably (Rice & Miller, 2001; Shapiro & Cartwright, 1998). It is clear that "the culture of colleges of education must change, so that technology becomes an important responsibility for each and every faculty member" (Schrum, Skeele, & Grant, 2002, p. 257). In comparison to faculty use of mainstream computer applications such as e-mail, the Internet, and word processing, their use of instructional computer technologies is low (Aust, Newberry, O'Brien, & Thomas, 2005; Grasha & Yangarber-Hicks, 2000; Groves & Zemel, 2000; Howland & Wedman, 2004; Sahin & Thompson, 2006; Schrum et al., 2002; Spotts, 1999). The literature suggests that computer expertise, attitudes toward computers, support for computer use, and availability of computer technologies are among the variables that might affect faculty use of computer technologies (Isleem, 2003; Sahin, 2006). Even though educators should integrate computer-based technologies into their academic subject areas (Niess, 2005), it is obvious that faculty cannot use either mainstream or instructional technologies without the necessary knowledge.

For faculty to use instructional technology and to model its use in the classroom, they should first learn appropriate and basic technology skills and uses (Howland & Wedman, 2004; Rups, 1999). Faculty should have expertise in instructional computer technologies, since these technologies (1) provide students with active learning, (2) connect learning with real life situations, (3) offer easy access to significant amounts of information, and (4) allow faculty to adapt teaching styles to each student's needs (Newman & Scurry, 2001). In fact, most faculty use computer technologies to do their own work, but they have little knowledge or expertise about instructional computer applications (Kahn & Pred, 2001). Faculty expertise in instructional computer technologies is inevitable for a successful integration of these technologies into their curricula. On the other hand, providing the needed knowledge alone may not be enough for faculty to become confident in computer technologies. Their attitudes toward these technologies also need to be considered in professional development efforts.

Faculty attitude toward technology is still a crucial factor that affects faculty use of new technologies (Bitner & Bitner, 2002; Hagner, 2000; Maddux, 1998; Martin, 2001; Yang & Yoo, 2003). A national survey of faculty reported that a majority of faculty have computer anxiety that may prevent them from using technology (Mcqueen, 1999). In that survey, two-thirds of faculty stated they are stressed to keep up with new technology. According to this report, while approximately 85% of faculty use e-mail and word processing, only approximately 35% use the Internet and technology for research and instructional purposes (Mcqueen, 1999). As a motivating factor, social and environmental support is needed for faculty to have positive attitudes toward instructional computer applications (Sahin & Thompson, 2007).

Faculty should be well supported to reduce anxiety toward new technologies and to increase their use of technology, by helping them become fully capable of using new technologies. In research designed to understand technology use by college of education (COE) faculty in the United States, Sahin and Thompson (2007) found collegial support to be a significant predictor in the level of technology adoption. As social and motivating factors, administrative or collegial support influences faculty members' use of computers for instructional purposes (Aust et al., 2005; Dusick, 1998; Groves & Zemel, 2000; Lee, 2001; Marx, 2005; Rups, 1999). Dusick (1998) describes the availability of computer technology as an environmental factor that also affects faculty members' preference to use or not to use the technology.

Access to computer technology in faculty offices and classrooms should be considered in the professional development process (Howland & Wedman, 2004). For faculty to be confident in instructional computer technologies and integrate these technologies successfully into their teaching, appropriate resources such as computer hardware and software should be available and accessible to them (Groves & Zemel, 2000). The

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literature suggests that expertise in, attitude toward, support for, and access to computer technologies are the major factors that might affect faculty use of these technologies.

If we expect higher education faculty to integrate the technology into their teaching, we should understand better the variables that affect their use of technology for instructional purposes and the relations that exist among these variables. Although a limited number of studies reported more faculty use of mainstream computer applications and less faculty use of instructional computer applications (Collier, Weinburgh, Rivera, 2004; Grasha & Yangarber-Hicks, 2000; Groves & Zemel, 2000; Hall & Elliott, 2003; Howland & Wedman, 2004), a clear distinction was not made between instructional and mainstream computer uses. Moreover, there is a lack of research on the predictors of these two types of computer uses. The purpose of the current study is to differentiate instructional and mainstream computer uses by COE faculty and to determine their predictor variables. Moreover, this study proposes a faculty instructional computer use model, operationalized as a structural equation model that shows the relationships between two types of computer uses and their predictors. The resulting model is derived from Isleem's (2003) and Sahin's (2006) prior studies.

Isleem (2003) studied instructional computer use by technology education teachers. He analyzed the relationships between the computer use level and the following variables: expertise, access, attitude, support, and demographics. Perceived expertise, access to computers, and attitude toward computers were found as the significant predictors of the computer use level.

In another study, Sahin (2006) examined instructional computer use by college of education faculty members at an Anatolian university in Turkey. Sahin summarized and discussed the study findings with respect to Everett Rogers' (2003) diffusion of innovations theory. The following variables were found to be significantly correlated with the computer use level: computer ownership in the office, age, years of computer experience in general, computer expertise, computer access, barriers to computer access, attitude toward computer use, support for computer use, and adopter categories based on innovativeness.

Methodology

The present study analyzes the relationships among the variables that predict COE faculty computer use. The participants of this study were 384 tenure-track faculty members from six Midwestern universities in Turkey and were contacted through e-mail. Since the present study was conducted online, the six universities were chosen, as the e-mail information of their faculty members was generally available. As discussed earlier, the literature shows computer expertise, access, attitude, and support as the important factors that might affect faculty use of computer technologies. After reviewing the related literature, Sahin's (2006) research instrument, partially modified and adopted from Isleem's (2003) study, was found to be appropriate for the purpose of this study to assess COE faculty computer use and the variables that predict their use of computers.

Research Instrument

The research instrument was a survey originally created by Isleem (2003) from the "literature in the area of teacher education, the diffusion of innovations theory, the evaluation of the current state of teaching, and major barriers that impede teachers from using computers" (p. 45). Then, it was partially modified by Sahin (2006). Although Sahin used Rogers' (2003) diffusion of innovations theory as the theoretical framework of his study and added a section to classify the participants according to Rogers' adopter categories to the survey, Rogers' theory was not the focus of the present study and not used in the analysis of the data. Hence, Rogers' theory and adopter categories were not included in the current study. The survey consisted of five sections (see the Appendix for the list of survey items):

1. Computer Use and Expertise: This section consisted of 16 computer applications and software about faculty members' perceived levels of computer use and expertise. A five-point Likert-type set of alternatives ranging from "never" to "very often" and from "none" to "expert" was used to determine faculty members' levels of instructional computer use and expertise, respectively.
2. Computer Access and Barriers: This section included 5 items regarding faculty members' perceived access to computers and 11 items regarding the barriers to their computer access. A five-point Likert-type set of alternatives ranging from "never" to "very often" and from "not at all" to "very often" was used to assess participants' computer access and barriers, respectively.
3. Attitude: The third section contained 10 items regarding the faculty members' attitudes toward computers. This section used a five-point Likert-type set of alternatives ranging from "strongly disagree" to "strongly agree."
4. Support: The support section included 10 items about the faculty members' perceived support. A five-point Likert-type set of alternatives ranging from "strongly disagree" to "strongly agree" was used to determine the support for instructional computer use.
5. Demographics: The last section consisted of three items about faculty demographics: academic rank, age, and teaching experience in higher education.

Data Analysis

In this study, factor analysis was used to reduce the number of variables in sections 1, 2, 3, and 4 described above (see the Appendix for the factor loadings, mean scores, and reliability results for each section of the survey). Reliability analysis, which assesses the internal consistency among sets of survey items (Mertler & Vannatta, 2002), was employed to measure the reliability of each section of the survey. Cronbach's alpha value, usually ranging from 0 to 1, was used to report the reliability. Next, a structural equation model that fits the data well was analyzed. For each endogenous (dependent) variable, an equation was estimated by exogenous (independent) or endogenous variables in another equation. Both the direct and indirect effects of independent variables on the dependent variables were estimated. Statistical analyses were conducted using SPSS (Statistical Package for Social Sciences) 13.0 and AMOS (Analysis of Moment Structures) 5 software.

Findings

A total of 198 COE faculty members responded to this study, for a response rate of 52%. The most heavily represented group was assistant professors (n = 85), followed by lecturers and instructors (n = 73), professors (n = 24), and associate professors (n = 16). Faculty respondents were distributed across the following age groups: 20-29 (n = 27), 30-39 (n = 78), 40-49 (n = 54), 50-59 (n = 26), and over 59 (n = 12). The most frequently occurring amount of teaching experience in higher education was 11–15 years (n = 54), followed by 6–10 years (n = 51), over 20 years (n = 35), 1–5 years (n = 32), and 16–20 years (n = 26). To fit the model, responses with missing data were excluded from the structural equation analysis, resulting in a total of 167 useable responses. Comparing results from alternative models based on modification indexes resulted in the model reported here, which had optimal fit measures and both predictive and explanatory validity.

Factor Analysis

Computer use

For the computer use section of the survey, two factors emerged. Since the computer applications loading highly on the first factor were related to the use of computers for instructional purposes, the first factor was named "instructional computer use." The results suggest that faculty members see pedagogical value in their use of some computer applications such as database management, authoring, and Web-site design.

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The computer applications loading heavily on the second factor measured the personal and mainstream uses of computers, so this factor was labeled "mainstream computer use." The Cronbach standardized item alpha value was .92, confirming that a summated rating scale could be formed meaningfully from these variables. In general, the results of the descriptive data analysis supported the implication of these two factors that faculty members had high levels of use of more mainstream computer applications such as word processing, e-mail, and Internet; whereas, they reported low levels of more instructional computer applications, such as tutorials, simulations and games, and classroom management.

Computer expertise

The 16 computer applications and software measuring level of computer use also were used to assess the level of computer expertise. Interestingly, the factor analysis resulted in the same two factors as the computer use factors: "instructional computer expertise" and "mainstream computer expertise." The fact that the factor analysis results for the computer expertise applications items loaded in the same way as the computer use factors, with a high Cronbach standardized item alpha value (.94), confirmed the significance of this study and the reliability of the results. Similar to the levels of computer use, COE faculty members reported high levels of expertise in more mainstream and personal computer applications, such as word processing, e-mail, and the Internet, while they had low levels of expertise in more specialized and instructional computer applications, such as tutorials, authoring, and simulations and games. These results also validated the two major computer use factors.

Computer access and barriers to computer access

This section consists of five items, with reliability (standardized item alpha) of .68: computer access in their offices, most classrooms where they taught, computer labs, library/media center, and at home. In the factor analysis, two factors emerged. Since the items for computer access in classrooms, computer labs, and library/media center were related to computer access in more public spaces, the first factor was named "public computer access." Also, the second factor was labeled "personal computer access," because computer access in the office and at home refer to computer access in personalized places. Overall, the data analysis showed that faculty members had the most computer access in more personalized spaces; whereas, their computer access in public places varied.

Eleven items evaluated the barriers that limited COE faculty members' computer access and use. These items loaded on two factors. The items loading heavily on the first factor measuring barriers related to a lack of computer software and hardware support, so the first factor was labeled "software and hardware barriers." Other barriers linked with a lack of computer training and technical support were the dominant items in the second factor, which was labeled "training and technical barriers." The reliability of these 11 items together was high (standardized item alpha = .91). For COE faculty members, the lack of appropriate instructional software, technical support, and support for computer integration into the curriculum were among the most frequent barriers to computer use.

Attitude toward computer use

As seen in the Appendix, the loadings of the three attitude factors were generated from 10 survey items (standardized item alpha = .86), regarding COE faculty members' attitudes toward computer use. The factors were labeled, respectively, "attitude toward instructional computer use," "confidence in computer use," and "anxiety and workload increase with computer use." In general, the participants reported positive attitudes toward computer use.

Computer support

Ten items, with reliability (standardized item alpha) of .77, addressed the support that COE faculty members receive to use computers. Three factors emerged. The first was labeled "collegial support," as the survey items loading heavily on this factor were related to collegial support and interaction. The dominant variables in the second factor measured computer support from administration, so the second factor was named "administrative support." Since trialability and observability in computer use require, respectively, individual and social support (Sahin & Thompson, 2006), the last factor was labeled "individual and social support." COE faculty members reported they had a great deal of support from their colleagues and enough opportunity to try computers.

In general, the survey items were combined successfully into factors with high reliabilities. Two dependent variables emerged: instructional computer use and mainstream computer use. Moreover, the following factors that might affect uses of instructional and mainstream computer applications by COE faculty members emerged: (1) instructional computer expertise, (2) mainstream computer expertise, (3) public computer access, (4) personal computer access, (5) hardware and software barriers, (6) training and technical barriers, (7) attitude toward instructional computer use, (8) confidence in computer use, (9) anxiety and workload increase with computer use, (10) collegial support, (11) administrative support, and (12) individual and social support. In the next section, the significant predictors of uses of instructional and mainstream computer applications will be reported in a structural equation model.

Structural Equation Analysis: Faculty Instructional Computer Use Model

As shown in Figure 1 (p. 60), the final AMOS model (χ^2 = 8.76, df = 11, p = .64) included four exogenous variables (personal access, expertise in instructional and mainstream computer applications, and collegial support) and three endogenous variables (instructional and mainstream computer uses, and attitude toward instructional computer use). The model includes all the variables and only significant paths among those. The Bentler-Bonett normed fit index (NFI), Bollen's relative fit index (RFI), the Tucker-Lewis coefficient index (TLI), and other indicators verify the accuracy of the reduced model and the relationships between the variables incorporated in the model. It is important to note that the reduced model shown in Figure 1 contains only significant relationships among the observed variables. In particular, all pairwise correlations among the exogenous variables were estimated, with only the correlation (r = .53) significant between personal computer access and mainstream computer expertise. It is logical and expected that faculty with more computer access in their home and office will have more expertise in mainstream computer applications, such as e-mail and Internet because the hardware for those applications is readily at hand. Testing for correlations among the exogenous variables, and retaining the one significant result, controls for possible confounding attributable to multicollineary among the exogenous variables and enhances the validity of interpretations drawn from this model's results.

As shown in Table 1 (p. 60) , COE faculty members, who have more computer access at home and the office (t = 3.96, $p < 0.01$), have more knowledge and skills in mainstream computer applications (t = 15.41, $p < 0.01$). Also, COE faculty members, who have more computer support from their colleagues (t = 3.10, $p < 0.01$), are more likely to use computers for personal and mainstream purposes. Moreover, 73% of variation in the mainstream computer use variable can be explained by mainstream computer expertise, personal computer access, and collegial support. Knowledge of these three factors significantly increases the ability to predict COE faculty members' personal and mainstream uses of computers.

The effect of collegial support is mainly on faculty attitudes toward instructional computer use. COE faculty members, who have more collegial support about computer use (t = 3.87, $p < 0.01$) and more expertise in instructional computer applications (t = 2.40, $p < 0.05$), are more likely to have positive attitudes toward computer use for instructional purposes. Collegial support and instructional computer expertise explain 11% of variation in attitudes.

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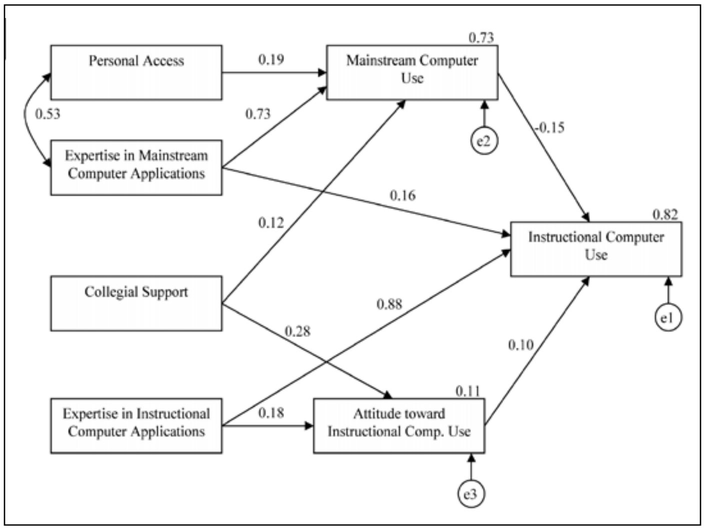

Figure 1: Faculty instructional computer use model

Similar to collegial support, the major effect of instructional computer expertise is on instructional computer use. COE faculty members, who have expertise in both mainstream ($t = 2.69$, $p < 0.01$) and instructional ($t = 26.09$, $p < 0.01$) computer uses and have more positive attitudes toward educational uses of computers ($t = 2.82$, $p < 0.01$), are more likely to use computers for instructional purposes. However, COE faculty members, who use computers more for personal purposes, are less likely to use them for instructional purposes ($t = -2.55$, $p < 0.05$). This result suggests that COE faculty members' frequent and extensive mainstream uses of computers may detract them from instructional computer use. In addition, the significant predictors explain a very large portion of variation (82%) in instructional computer use. In other words, COE faculty members' expertise in instructional and mainstream computer applications, and their attitudes toward computers as instructional tools increase the likelihood of their instructional computer use.

Direct and indirect effects

Total effects are decomposed into direct and indirect effects, as displayed in Table 1. In the path model, the majority of the total effects come from only direct effects. For instance, the direct effect of personal computer access on mainstream computer use, also, is its total effect on mainstream computer use.

The path from instructional computer expertise to instructional computer use has a direct effect of 0.88, which is 98% of the total effect (0.90). The indirect path from instructional computer expertise through mainstream computer use to instructional computer use has a small effect (0.02). It is important to note that mainstream computer use has a suppressing effect that mediates the relationship between instructional computer use and mainstream computer expertise. When the path between mainstream computer expertise and mainstream computer use or the path between mainstream computer expertise and instructional computer use is excluded from the model, the other path becomes non-significant. While the direct effect of mainstream computer expertise on instructional computer use is positive (0.16), the path from mainstream computer expertise through mainstream computer use to instructional computer use is negative (-0.11). Hence, mainstream computer expertise has a small total effect on instructional computer use (0.05).

Conclusions

The results of this study show mainstream and instructional computer uses are two distinct factors for COE faculty members. While common knowledge has suggested that helping COE faculty members acquire mainstream computer skills will increase their classroom use of computer

Table 1: Decomposition of Total Effects for the Faculty Instructional Computer Use Model

Predictor variable	Dependent variable	Total effect [a]	Direct effect	Indirect effect	Standard error	Critical ratio (t)
Personal access	Mainstream computer use	0.19	0.19	0.00	0.05	3.96**
Collegial support	Mainstream computer use	0.12	0.12	0.00	0.04	3.10**
Collegial support	Attitude toward instructional computer use	0.28	0.28	0.00	0.07	3.87**
Expertise in instructional computer applications	Attitude toward instructional computer use	0.18	0.18	0.00	0.07	2.40*
Expertise in mainstream computer applications	Mainstream computer use	0.73	0.73	0.00	0.05	15.41**
Mainstream computer use	Instructional computer use	-0.15	-0.15	0.00	0.06	-2.55*
Attitude toward instructional computer use	Instructional computer use	0.10	0.10	0.00	0.03	2.82**
Expertise in instructional computer applications	Instructional computer use	0.90	0.88	0.02	0.03	26.09**
Expertise in mainstream computer applications	Instructional computer use	0.05	0.16	-0.11	0.06	2.69**

[a] *Total effect = Direct effect + Indirect effect, * $p < 0.05$, **:$p < 0.01$.*

technologies, results from this study indicate that this is not necessarily true. Given the separateness of these two factors and the different predictor paths for each, faculty developers need to consider these results in planning programs for faculty members. Considering the results from this study, it should be noted that the faculty instructional computer use model may fit well and be defensible with the contextually-related studies and literature, but it does not imply causality. Further research may be conducted to validate the accuracy of the model. Also, other studies may include predictors such as environmental or institutional variables in the analysis to strengthen the faculty instructional computer use model. Thus, this model suggests avenues for further research in exploring additional predictive variables and establishing causing relationships.

Mainstream computer use by COE faculty members was predicted significantly by their personal computer access, collegial support, and mainstream computer expertise. It is important to highlight that collegial support is a motivation both to increase mainstream computer use by COE faculty and to change faculty attitudes positively toward instructional computer use. The influence of collegial support on instructional computer use might be explained in terms of diffusion of innovations—the more "taboo" or "uncertain" an innovation, the greater the social influence, especially from salient others, to help potential adopters move into the adoption stage. Developers of faculty training programs in instructional technologies need to focus upon creating learning communi-

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ties that involve collegial interaction and collaboration. While Sahin and Thompson (2007) found collegial support was a significant predictor of the technology adoption level, in general, the related literature suggested that collegial support also influences faculty members' attitudes toward computer use for instructional purposes (Aust et al., 2005; Groves & Zemel, 2000; Lee, 2001; Marx, 2005).

In addition to collegial support, instructional computer expertise also affects faculty attitudes toward instructional computer use. Finally, positive faculty attitudes toward computers as instructional tools, along with instructional computer skills, increase the likelihood of instructional computer use by COE faculty members. As presented in Table 1, the total effect of mainstream computer expertise on instructional computer use is positive, but minor, since its effect through mainstream computer use on instructional computer use is negative. Extensive mainstream uses may even detract from instructional computer use. The literature further suggests that although the high level of faculty use of mainstream computer applications is present, their use of instructional computer technologies is low (Aust et al., 2005; Grasha & Yangarber-Hicks, 2000; Groves & Zemel, 2000; Howland & Wedman, 2004; Schrum et al., 2002). These results lead to the conclusion that higher education institutions should provide faculty with appropriate academic conditions to increase their use of computers for instructional purposes.

In summary, the findings from this study clearly show the distinction between mainstream computer use and instructional technology use and their predictors, and suggest the need to focus faculty development work directly on instructional computer use rather than mainstream computer use. To increase computer use for instructional purposes by COE faculty, this model suggests that faculty development efforts should concentrate on more faculty expertise in instructional computer applications and should focus more on faculty attitudes toward these applications that are positively influenced by their instructional computer knowledge and collegial support.

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After obtaining his MS degree in Educational Technology from the University of Missouri in Columbia, Missouri, Dr. Sahin was admitted to the doctoral program of Curriculum and Instructional Technology at Iowa State University in Ames, IA. Now, Dr. Sahin is an assistant professor in the Department of Computer and Instructional Technologies at Selcuk University in Turkey. He is also vice chair of the same department. His major research thrust is now in the area of faculty development and teacher education.

Ismail Sahin, PhD
Vice Chair and Assistant Professor
Department of Computer and Instructional Technologies
College of Education
Selcuk University
Meram, Konya 42080
Turkey
90.332.323.8220
isahin@selcuk.edu.tr

Appendix: Results of Factor Analyses and Reliability Tests

Factors	Items	Mean	Factor loadings			Std. item alpha
			Factor 1	Factor 2	Factor 3	
Instructional computer use	Database management (i.e., creating, designing, updating, and querying data)	2.44	0.67	0.21	–	
	Classroom management (i.e., grade books, Blackboard, WebCT)	2.20	0.64	0.19	–	
	Authoring (i.e., creating interactive multimedia programs or CAI)	1.98	0.81	0.13	–	
	CD-ROM, DVD, and/or Web-based interactive content (i.e., maps, dictionaries)	2.58	0.53	0.43	–	
	Website design software (i.e., FrontPage, Dream Weaver)	2.07	0.64	0.26	–	
	Simulations and games (i.e., reproducing the characteristics of a system or process)	1.96	0.74	0.18	–	
	Drill and practice (i.e., using software for repetitive practice)	2.06	0.87	0.01	–	
	Tutorials (i.e., providing instruction that uses exercise and practice)	1.79	0.87	0.01	–	.92
	Discipline-specific programs (i.e., your academic subject)	2.62	0.69	0.25	–	
Mainstream computer use	Word (i.e. creating, storing, retrieving, and printing electronic text)	4.40	0.11	0.88	–	
	Spreadsheets (i.e., manipulating/ organizing numbers)	3.07	0.50	0.54	–	
	Graphics (i.e., storing/manipulating pictures, diagrams, graphs, or symbols)	3.13	0.45	0.66	–	
	Presentation (i.e., PowerPoint)	3.19	0.42	0.69	–	
	E-mail (i.e., sending and receiving electronic messages)	4.44	0.01	0.85	–	
	Internet content (i.e., browsing/searching the World Wide Web)	4.32	0.00	0.84	–	
	Data analysis software (i.e., SPSS, SAS or JMP)	2.54	0.32	0.39	–	
Instructional computer expertise	Database management	2.46	0.64	0.35	–	
	Classroom management	2.25	0.63	0.32	–	
	Authoring	2.11	0.88	0.13	–	
	CD-ROM, DVD, Web-based interactive content	2.60	0.63	0.45	–	
	Website design software	2.13	0.68	0.29	–	
	Simulations and games	2.04	0.78	0.13	–	
	Drill and practice	2.16	0.84	0.22	–	
	Tutorials	1.89	0.85	0.17	–	
	Discipline-specific programs	2.62	0.68	0.38	–	.94
Mainstream computer expertise	Word	3.83	0.14	0.90	–	
	Spreadsheets	3.03	0.47	0.66	–	
	Graphics	3.16	0.46	0.68	–	
	Presentation	3.35	0.39	0.77	–	
	E-mail	3.96	0.13	0.86	–	
	Internet content	3.91	0.17	0.84	–	
	Data analysis software	2.45	0.22	0.50	–	
Public computer access	In classrooms	2.70	0.59	0.55	–	
	In computer lab	2.30	0.84	0.01	–	
	In library/media center	2.60	0.80	0.01	–	.68
Personal computer access	In office	4.51	-0.01	0.88	–	
	At home	3.88	0.30	0.62	–	

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Hardware and software barriers	Not enough computers	2.61	0.52	0.44	–	
	Not enough software licenses	2.43	0.71	0.18	–	
	Outdated/incompatible computers	2.48	0.85	0.30	–	
	Outdated/incompatible software	2.44	0.86	0.25	–	
	Unreliable computers and/or software	2.47	0.81	0.27	–	
	Lack of appropriate instructional software	2.94	0.58	0.37	–	.91
Training and technical barriers	Internet is not easily accessible	2.38	0.45	0.53	–	
	Lack of support for educational uses of computers	2.92	0.32	0.78	–	
	Lack of technical support	2.85	0.33	0.79	–	
	Lack of time in schedule for instructional computer use	2.64	0.24	0.80	–	
	Lack of training on existing computers and software	2.74	0.18	0.78	–	
Attitude toward instructional computer use	Relative advantage of instructional computer use	4.18	0.80	0.29	0.15	
	Compatibility of instructional computer use	3.83	0.65	0.29	0.13	
	Computer usefulness in learning	3.96	0.86	0.00	0.12	
	Instructional computer use	3.94	0.78	0.29	0.01	
	Colleagues' instructional computer use	4.32	0.76	0.17	0.14	
Confidence in computer use	Simplicity of computer use	4.15	0.25	0.83	0.01	.86
	Confidence in computer use	3.85	0.17	0.82	0.15	
	Email usefulness	4.47	0.46	0.47	0.01	
Anxiety and workload increase with computer use	Computer anxiety[a]	4.16	0.24	0.14	0.80	
	Workload increase with computer use[a]	3.43	0.01	0.01	0.88	
Collegial support	Hardware and software updates, and technical support from colleagues	3.42	0.67	0.25	0.00	
	Colleagues' discouragement of computer use[a]	3.52	0.63	189.00	0.10	
	Sharing information and ideas about computer use among colleagues	3.60	0.59	-0.01	0.12	
	Colleagues' good modeling of computer use	3.17	0.78	0.01	0.01	
Administrative support	Lack of support for consistent hardware and software, and updates from administration[a]	3.06	0.14	0.63	-0.33	.77
	Technical and maintenance support of computers from administration	3.09	0.23	0.76	0.18	
	Workshops and training on computer use from administration	2.61	-0.01	0.76	0.13	
	Computers as important instructional tools for administration	3.55	0.42	0.59	0.20	
Individual and social support	Trialability in computer use	3.42	0.01	-0.01	0.89	
	Observability in computer use	2.87	0.25	0.35	0.53	

[a]Items were reverse-coded

sigte

The Special Interest Group for Teacher Educators of the International Society for Technology in Education, SIGTE works to support professionals responsible for providing teaching and learning experiences that emphasize effective use of instructional technologies and impact both preservice and inservice teachers.

Extend Your Learning Community

Who Are Our Members?

SIGTE members include higher education faculty teaching in graduate and undergraduate programs, graduate students, K–12 teachers, administrators, information technology specialists, and curriculum specialists teaching and conducting research in teacher preparation and instructional technology.

Members are interested in preparing beginning teachers in using technology to support and enhance student learning, preparing educational technology leadership personnel, and/ or providing professional development to practicing educators that will enable them to use technology effectively and appropriately to support and enhance learning in K–12 classrooms.

Specifically, SIGTE:

- Collects and disseminates information through publications and electronic communication networks
- Sponsors research presentations, meetings, conference sessions, and workshops to promote professional development
- Works to establish national standards for K–12 students, teachers, and administrators
- Recommends policy and guides decision making regarding instructional technology and teacher education
- Organizes working groups for research, study, and writing activities to meet the needs of its membership

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