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Technology Integration: Do They or Don't They? A Self-Report Survey from PreK Through 5th Grade Professional Educators

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The practice of integrating technology into classroom instruction is mandated by the State of Texas (TEA, 2005, http://www.tea.state.tx.us/teks/index.html). Using a self-report survey, this study investigated technology integration practices on two elementary campuses in a suburban, small-town independent school district, which resides on the outskirts of a large southeastern metropolitan city. Results indicated that the professional educators were not implementing technology within their classroom learning environments at the instructor-centered level, with the exception of gathering information for lesson planning. Results also indicated that professional educators were not implementing technology within the classroom-learning environment at the learner-centered level.

The State of Texas prescribes for all students in the Texas Essential Knowledge and Skills (TEKS) document that technology is to be integrated into the standard curriculum (http://www.tea.state.tx.us/teks/). This prescription calls for professional educators to integrate technology as a part of their instructor-centered instruction as well as for students to implement the use of technology in a student-centered fashion. This researcher's intent is to demonstrate that, in certain settings, technology integration is not being implemented on either level.

LITERATURE REVIEW

Requirements such as these are not unique to the State of Texas. For example, Alabama uses the International Society for Technology in Education (ISTE) Standards (http://www.iste.org/) as a basis for technology integration (Ash, Sun & Sundin, 2002). The federal government started the trend toward these requirements when the *Goals 2000: Educate America Act* became law in 1994 (Denton, Davis, Strader & Durbin, 2003). Further, technology literacy was emphasized in the *No Child Left Behind Act* of 2001 (Texas Education Agency [TEA], 2002, http://tea.state.tx.us/technology/lrpt/lrpt_lrpt.html; Denton et al.). However, because the implementations of such acts were delineated by oversight entities, it does not necessarily follow that schools and, more specifically, professional educators have been successfully integrating technology into the standard curriculum.

In 2002, it was reported that professional educators in an Alabama middle school were still at the beginning level of technology integration in the classroom (Ash et al., 2002). Kindergarten through fifth grade professional educators in a school in the mid-Atlantic region reported that they "do not like to teach with technology" (Cummings, 1998, p. 15). In this same report, it was stated that, although the primary professional educators reported a high level of technology integration in language arts, science, and mathematics, they reported a low level of technological integration in the subject-specific areas of social studies, health, art, and music. These professional educators stated that they have the knowledge and skills to integrate technology, but not the time (Cummings). Along these same lines, a study of professional educators in a Kansas school district indicated that they perceived the importance of technology integration in classroom learning environments; however, the report indicated that their technology integration attempts mostly utilized a word processing program (Kocher & Moore, 2001). A study completed by second, third, and fourth grade professional educators from 41 elementary schools in the Diocese of Grand Rapids also suggests that most professional educators use technology for mere word processing components (English, 2002).

There are several visible barriers to help clarify why technology integration is not progressing as swiftly as many would like. One prominent barrier that exists is lack of training in technology for professional educators. Although in 1998, the Education Commission of the States recommended that school districts devote 30% of their technology budget to teacher training, it was

noted that the average school district used 6% of their annual budget towards professional development opportunities (Denton et al., 2003). A later survey conducted by Market Data Retrieval suggested that this budget amount had risen to 17%, a number still significantly lower than the 30 percent recommended (Denton et al.). Another barrier to the integration of technology is desire. As stated earlier, some professional educators are not aware of the instructional support through the integration of technology into the learning environment, and are reticent towards integrating technology into their classrooms (Cummings, 1998). A third barrier as stated by professional educators is time (Cummings). A teacher surveyed in an Ohio study indicated, "Technology integration will not be achieved in the schools until we are trained and have the time to practice it in our classrooms" (Franklin, 2000, p. 7).

As stated by English (2002), integrating technology into the standard curriculum has been an ongoing struggle for over 20 years. The findings from this research study support statements by English, and suggest that the struggle continues towards successfully integrating technology into the standard curriculum.

METHOD

This study implemented a self-report survey to determine to what extent PreK–5th grade elementary professional educators model technology use in their instruction. The survey was also employed to determine to what extent do PreK–5th grade professional educators incorporate student use of technology in classroom lessons.

Research Questions

The first of two research questions addressed by the researcher for the purpose of this study is, do professional educators in a Pre–5th grade public school setting model technology use in their instruction? The second research question addressed for the purpose of this study is, to what extent do professional educators in PreK–5th grade public school incorporate learner-centered integration of technology in the learning environment?

Participants

A total of 45 full-time faculty members from Beasley Elementary and Seguin Elementary in the Lamar Consolidated Independent School District (http://www.lcisd.org/) of Richmond/Rosenberg, Texas, completed and returned the survey questionnaire. Richmond, Texas, and Rosenberg, Texas, are two small towns just outside of Houston, Texas, in Harris County, which is the third largest county and the tenth largest metropolitan area in the United States of America (Rosenberg, 2005). As such, both Richmond and Rosenberg, Texas, have begun to feel the impact of subsequent metropolitan growth and middle-class flight to the smaller town suburbs, much as has occurred in larger cities across the United States. Twenty-three (23) of those responding were from Beasley Elementary, and 22 were from Seguin Elementary, with 100% of the full-time faculty for each campus completing and returning the survey questionnaire. Teacher aides and itinerate professional educators were not included.

The student enrollment at the time of the survey for Beasley Elementary was 282 (http://www.lcisd.org/Schools/ElementarySchools/BeasleyElementary), while the student enrollment at the time of the survey for Seguin Elementary was 300 (http://www.lcisd.org/Schools/ElementarySchools/SeguinElementary). As such, a significant number of student learners are impacted by the results of this study. Demographics information for the 2004-2005 school year were not available at the time of this report; however, the Academic Excellence Indicator System provided by the TEA (2003, http://tea.state.tx.us/accountability.html) for the previous school year 2003-2004 offered data for Beasley Elementary, as represented in Table 1.

Beasley Elementary is primarily Hispanic, with a large Caucasian population. Of interest is that the ethnic distribution of instructional staff is primarily Caucasian, and 100% female in gender, with a large number of educators new to the profession or who have been a professional educator for at least a 20-year period. As such, the teaching faculty at the school is either new to the profession, or has been a professional educator for a significant period of time; very few of the teaching faculty falls in the years of experience categories of between 5 to 20 years.

Table 1
Demographics for Beasley Elementary 2003-2004 School Year

Demographic Area	Area	Percent
Ethnic Distribution	African American	6.7
	Hispanic	59.3
	Caucasian	34.1
Student Population by Grade Levels	PreK	7.8
	Kindergarten	15.2
	1st Grade	16.3
	2nd Grade	15.2
	3rd Grade	16.3
	4th Grade	12.6
	5th Grade	16.7
Distribution of Teaching Staff	Caucasian	82.3
	Hispanic	17.1
	Female	100
Years of Experience	Beginning Teachers	11.8
	1-5 years	35.3
	6-10 years	8.8
	11-20 years	11.8
	20+ years	32.4
Other	Mobility Rate	19.1
	Economically Disadvantaged Rate	62.6
	Limited English Proficient Students	13.3

The Academic Excellence Indicator System provided by the TEA (2003, http://tea.state.tx.us/accountability.html) for the previous school year 2003-2004 also offers data for Seguin Elementary, as represented in Table 2.

Seguin Elementary is primarily Hispanic, with the African American, Caucasian, and Asian and Pacific Islanders significantly less as relates to population demographics. Of interest is that the ethnic distribution of instructional staff is primarily Caucasian and Primarily female in gender, with almost half of the professional educators holding five or fewer years in the profession. As such, the teaching faculty at the school is either new to the profession, or has been a professional educator for a significant period of time; very few of the teaching faculty falls in the years of experience categories of between 5 to 20 years.

Table 2
Demographics for Seguin Elementary 2003-2004 School Year

Demographic Area	Area	Percent
Ethnic Distribution	African American	19.3
	Hispanic	76.8
	Caucasian	3.5
	Asian/Pac. Islander	.4
Student Population by Grade Levels	PreK	10.9
	Kindergarten	14.0
	1st Grade	18.9
	2nd Grade	14.7
	3rd Grade	15.4
	4th Grade	11.9
	5th Grade	14.0
Distribution of Teaching Staff	Caucasian	84.0
	Hispanic	12.0
	African American	4.0
	Female	92.0
	Male	8.0
Years of Experience	Beginning Teachers	0
	1-5 years	44.0
	6-10 years	22.0
	11-20 years	16.0
	20+ years	18.0
Other	Mobility Rate	29.2
	Economically Disadvantaged Rate	90.2
	Limited English Proficient Students	31.9

As indicated by the data presented, the highest percentage of professional educator experience on both campuses is in the one to five years range. The majority of professional educators on both campuses are female and Caucasian. As stated, 100% of the full-time faculty for each campus completed and returned the survey questionnaire indicated below to produce the following results.

Measures

This study used the Technology Integration Survey for Faculty (High Planes Regional Technology in Education Consortium, 2001, http://www.profilerpro.com/). The items were designed to obtain information related to if professional educators integrate technology into their teaching practices and if professional educators ask students to use technology in their learning.

Data Analysis

The data from the survey was collated using a Microsoft Excel spread sheet. Each answer of "agree" or "disagree" was entered as raw data. This data was then converted into percentages. These percentages were used to indicate, which way the majority fell for each question.

RESULTS

Results of the survey indicated two primary areas of focus. In this specific population, most PreK–5th grade professional educators do not model technology use in the classroom; and, most PreK–5th grade professional educators do not incorporate student use of technology in their lessons.

The majority of professional educators indicated, through the survey responses, that they do not implement strategies of technology integration into their classroom by giving a disagree response to most of the questions about professional educator use of technology. Further, the majority of professional educators surveyed also indicated, through the survey responses, that they do not require their students to employ technology in the classroom environment by offering a disagree response to most of the questions regarding student use of technology.

Professional Educator-Focused Use of Technology

As is well documented in the literature, the appropriate and successful integration of technology into the learning environment offers the opportunity to enhance the learner's understanding of the subject matter at levels of higher order thinking skills (Coleman, King, Ruth, & Stary, 2001; Spires & Jaeger, 2002; Orkwis, 2003; Fluellen, 2003), supports the learners towards meeting designated learning objectives (Coleman et al.; Spires & Jaeger; Orkwis; Fluellen), and aids in the learner's conceptual framework of understanding (Coleman et al.; Spires & Jaeger; Orkwis; Fluellen). Although the literature supports the integration of technology into the learning environment, supporting the professional educator's instructional technology integration may be lacking. Professional educators were asked to respond to items concerning modeling of technology and technology integration as indicated in Table 3. The majority of the responses fell in the disagree range with the exception of word processing, being able to critique information from the Internet, and using lesson plans published on the Web.

Table 3
Integration Modeled by Professional Educator

Technology Use	Percent Agree	Percent Disagree
Variety of software	31.1	68.9
Scanner	8.9	91.1
Digital Cameras	20.0	80.0
Video Cameras	11.1	88.9
Projection Devices	20.0	80.0
Word Processing	55.6	44.4
Spreadsheet Applications	27.3	72.7
Multimedia Software	44.4	55.6
Assistive Technology	11.1	88.9
Recommend Educational Software	18.2	81.8
Distance Education	9.1	90.9
Video Conferencing	6.8	93.2
Critique Internet Information	77.3	22.7
Lesson Plans Published on the Web	54.5	45.5
Multimedia Presentations	31.8	68.2
Create a Web Page	9.1	90.9

The majority of those surveyed indicated that they do not employ technology for distance education, video conferencing or a web page to teach their subject area with 90.0% answering that they do not use technology for distance education, 93.2% do not use video conferencing, and 90.0% do not use software, graphics, and digital images to create a web page. When asked about using digital and projection devices, 91% indicated they do not use a scanner, 80% do not use digital cameras, 88.9% do not use video cameras, and 80% do not use projection devices to develop and deliver instructional units. In response to the use of software to teach in their subject area, 68.9% indicated they do not use a variety of software packages, 72.7% do not use spreadsheet applications, 55% do not use multimedia software, 88.9% do not use assistive technology to promote learning for students with special needs, 81.8% do not evaluate and recommend educational software, and 68.2% do not use software, graphics, and digital images to create a multimedia presentation.

One area that the surveyed professional educators indicated they do employ technology is to gather information and plan for lessons. Of those surveyed, 77.2% indicated that they used the Internet in an informed manner and critically evaluate the information it provides for use in teaching their subject area. In addition, 54.5% of the participants use lesson plans and other resources published on the Web for teaching in their subject area. Over half, 55.6%, of the participants also use word processing for teaching in their subject area.

Learner-Focused Use of Technology

As is well documented in the literature, the learner's implementations of technologies in appropriate, innovative, and successful manners are of primary interest. It has been suggested that the learner-focused integration of technology offers the opportunity to enhance the learner's understanding of the subject matter at levels of higher order thinking skills (Coleman et al., 2001; Spires & Jaeger, 2002; Fluellen, 2003), supports the learners towards meeting designated learning objectives (Coleman et al., 2001; Spires & Jaeger, 2002; Fluellen, 2003), and aids in the learner's conceptual framework of understanding (Coleman, King, Ruth & Stary, 2001; Spires & Jaeger, 2002; Fluellen, 2003). The Professional educators surveyed were

also asked to respond to items concerning the incorporation of learner-focused implementation of technology into the learning environment, otherwise referred to as the classroom. Over half of the professional educators responded that they do not integrate the learner-focused implementation of technology in any area, as indicated in Table 4.

Table 4
Integration Required of Students

Student use of computers and technology activities that require or promote…	Percent Agree	Percent Disagree
Use of educational software.	25.0	75.0
Technology integration.	45.5	54.5
Equitable, ethical, and legal practices.	11.4	88.6
Critical thinking, problem solving, decision making	25.0	75.0
Learning for students with diverse needs.	27.3	72.7
Students cooperating and working as a team.	40.9	59.1
Skills such as word processing.	45.5	54.5
Skills such as use of the Internet.	40.9	59.1
Skills such as multimedia presentations.	9.1	90.9

Specifically, 90.0% indicated that they do not develop instructional units that require students to use computer-related skills such as multimedia presentations. When asked about integrating student use of software and computer-related skills, 75.0% do not develop instructional units that require the use of educational software, and 75.0% do not design instructional units that require students to use computers to promote critical thinking, problem solving, and decision-making, 72.7% do not design instructional units that use computers to facilitate learning for students with diverse needs. Of those surveyed, 54.5% do not develop instructional units that require students to use computer related skills such as word processing, and 59.1% do not require students to use the Internet. In response to designing activities that teach students about equitable, ethical, and legal use of computers, 88.6% indicate that they do not do this. When asked about assessing student learning, 54.4% do not use activities that integrate computers and related technologies in their assessments. Also, 59.1% do not develop learning opportunities that integrate computer and related technology that require students to cooperate and work as a team.

FUTURE CONSIDERATIONS

The professional educator responses indicated a need to address the lack of technology use in the PreK–5th grade public school setting. Suggested ways to address this void in technology education could be to incorporate more professional development opportunities related to integration technology for professional educators and requiring professional educators to document the implementation of technology in their lesson plans. This void can also be addressed by providing enough hardware and software for professional educators to use, especially by having more computers in each classroom for more expedient access by professional educators and students. A portable, wireless laptop and PDA lab designated specifically for technology applications is needed at each school. Each school already has a lab available that is focused upon drill and practice behavioral skill implementation, but does not leave time in the schedule for more cognitive or constructive technology applications endeavors.

Trained professional technology support staff must also be in place at each school, so the professional educators will have just-in-time support when confronted with hardware and software issues. As it stands now, there are only five to six professional technology support personnel for the entire district and professional educators have to wait up to four weeks for hardware and software issues to be addressed. This, in turn, causes professional educators to forgo any and or all technology integration they might have planned into a lesson. If trained professional technology support staff were more readily available, then more teachers might be willing to try new integrations without the fear of starting something only to have to abandon it unfinished.

Finally, formally assessing the technology skills of professional educators and students will significantly address concerns towards ensuring that technology integration in the PreK–5th grade public school setting will be both modeled by professional educators and implemented by the students. This has already been indicated with the science curriculum within the state of Texas. There was a serious lack of instruction in science on the elementary level prior to the institution of the state assessment for science. As soon as the science-specific test was implemented, science instruction jumped to the forefront of consideration. The same may happen as relates to technology skills, if a formal assessment were mandated.

In conclusion, there is a serious lack of technology use in this PreK–5th grade public school setting that could very easily be addressed. As with any subject, these precious educationally formative years are important for technology learning. However, they are not being used to make sure that our students receive the most of their education and can in turn rise to the highest of their potential in a technology centered world.

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