A STUDY OF TECHNOLOGY INTEGRATION IN THE CLASSROOM

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ABSTRACT

The integration of technology into the curriculum and its use are major concerns in our nation's schools. The following study was conducted to determine teachers' lack of use of technology. This study reflects the technology uses of teachers in grades six through twelve of K-12 school district. Of the 64 teachers who were surveyed 49 responded. The teachers were asked to complete a ten question survey to describe their technological uses, barriers to use, technology training, confidence level, and the future of technology. The results show that technology is being used at the same level by all teachers and there is not a clear and identifiable barrier for not using technology in the classroom. The implications are that more work needs to be done to determine the importance of the barriers and how to increase the use of technology.

INTRODUCTION

Technology is one of the basic skills that should be mastered in order to achieve success in an educational system. Advances in technology have opened a whole new world of learning that can only be maximized by embracing the challenges of technology and all the benefits that it holds for students as well as teachers. Technology can be used in the preparation of a lesson, as a communication device, as an instructional tool, or as a remote learning device. Future continues to hold more advancements and breakthroughs that may change the role of education as we currently know it. Although technology is an asset to educators, not all educators feel the inherent ease to incorporate technology into their classrooms. The benefits of technology are increasingly outweighed by the challenges that are involved in implementing technology for some educators (Ager, 2002; Gahala, J., 2001).

The United States Department of Education has even made technology a priority by the inclusion of technology in the landmark No Child Left Behind Act. In addition, it is charged with the mission of carrying out a national study of conditions and practices necessary for technology to be used effectively to
improve teaching and learning (US Department of Education, “National Study,” 2004). The need to reach students in a manner that promotes learning and improves the educational process is an important goal to achieve. The Department of Education states that technology can help improve education by individualizing students’ needs, equipping teachers with technology tools, empowering the public with current data, expanding the reach of teachers to include the best resources and opportunities, and engaging students in new ways of learning (US Department of Education, “Technology Initiatives,” 2004). The ability to use technology for the challenges in the next is a priority that must be met to keeping our students ready decades to come.

Teachers are faced with many challenges in their classrooms that can limit the use of technology. More crowded classrooms, more pressures to succeed due to the impact of No Child Left Behind Act and more day-to-day responsibilities are playing a key role in the allotment of time in the daily lesson planning of a teacher. Discipline issues and special needs students are other areas that have had a significant impact on incorporating technology into the classroom. Teachers are asked to make plans to address the needs of all students in the classroom while incorporating the use of technology. The ability to plan and gauge an entire lesson around all of these factors makes it extremely difficult to be an innovator or proponent in technological implementation. Educators are strapped for time to do adequate Justice to the addition of incorporating technology into their content areas.

The access and availability of technology is another issue in regards to determining the amount of use in the classroom. Computer lab availability can play a large role in determining the use of technology. Computer labs may be in constant use during lesson time or may lack the proper software that may be beneficial to students. This can limit the implementation of technology by educators. The equipment that is available may also be shared by other departments, which can restrict the opportunities of teachers to incorporate the use of technology. The availability of computers in the classroom will increase the likelihood that teachers will use it (U. S. Department of Education, “Teacher Tools,” 2004). The allocation and availability of resources are important parts of the strategy to increase technology use in the classrooms.

Another issue that may curb the use of technology is that teachers are not comfortable with technology. The level of knowledge and familiarity with technology can be a factor in the incorporation of technology into the daily lesson planning. It is very difficult to implement technology if the background training or familiarity with technology is lacking in any way. According to Bielefeldt (2001), current teacher training programs include using more technology, but there has not been the actual integration of technology in lessons planning and classroom use. By having teachers trained to integrate technology and having it modeled to them during their training, the results would be an increased use of it in future classrooms across the country. The motivation, the ability to adapt, and the development of new skills are factors in the lack of adoption of the use of technology in the classroom. Incorporating training in the use of technology at
the teacher trainer level will increase the use of technology as well as take away
the uncertainty and lack of familiarity that goes along with technology. Practice
makes perfect, or so they say.

The lack of a school district’s financial resources and other budgetary responsi-
sibilities play a large role in the use of technology. The initial expenditure of
technology has come from many different sources such as grants, donations, and
bond initiatives (Dede, 2002). Equipment, training, and maintenance of technol-
yogy items are now a significant portion of the funds that are available in a finan-
cial budget. Annual purchases as well as routine maintenance to keep items in
good working order can deplete allotted funds very quickly. Another additional
expense that increases the technology budget is the addition of extra personnel to
maintain and support all technology units that have been added to the school
district. The factors above play a part in keeping costs extremely high in the
implementation of technology to any given school district, which hinders the use
of technology with the current financial climate that exists for most school dis-
tricts. While the implementation and integration of educational technologies is
problematic, technology is not going away. Computers are believed to raise and
improve a student’s achievements as well improve the school’s overall well-
being and attitude (Archer, 2002). The ability to adapt and make technology a
tool that revolutionizes the classroom is the way of the future to enable students
to be successful in their future lives.

This study aimed at assessing the implementation and integration of technol-
ogy at the Middle and high school levels. The following research questions
guided this study:

- What types of technology are currently being used in the classroom?
- How are they being used in the classrooms?
- What are the reasons for not implementing technology in the classrooms?
- What is the level of teacher confidence in technology implementation and
use?
- Where do teachers see technology in the next ten years?

Instrument

The method of research was a survey that was comprised of a checklist, rank-
ings, and an open-ended question concerning technology use. The participants
were asked to provide demographic data about their building location, experi-
ence levels, and subject areas taught. The survey also included questions regard-
ing training received in technology, type of technology usage, and the frequency
of use of technology. The participants were asked to provide their input concern-
ing technology and how confident they were with the implementation and inte-
gration of technology. The open-ended question asked participants to forecast
the future uses of technology. The instrument was constructed to address the
main research questions.

The information was extracted on a voluntary basis. The survey asked basic
questions that relate to current uses, training methods, barriers and future use of
technology of individual staff members.
RESULTS

The participants were teachers at either the high school or middle school in a K-12 unit school district. The results were based upon 49 responses out of a total of 64 surveys which equaled a return rate of 77%. The respondents were asked their teaching location, their years of experience in teaching, and the subjects they taught.

The Middle School (MS) included grades sixth through eighth. The total amount surveyed at the High School (HS) was 35 with 2% responding with a return rate of 77%. The MS had a response rate of 76% with 22 responding out of a total of 29. This was the total population of the participants in this study.

The following items were developed based upon the actual surveys that were returned. The actual results were based upon 49 responses out of a total of 64 surveys which was a 77% rate of return. The data from the questionnaires has been organized into six main areas: technology items in use in the classroom, how they are being used, barriers to using technology, level of confidence of user, training levels, and the future use of technology in the next ten years.

The teachers reported using many types of technology tools with the highest usages rate in email (15%), word processing (15%), and electronic grad book (14.9%). This question asked participants to select as many devices as it applies to their usage. The least frequent way to utilize technology was technology as an instructional device (2.7%). The section that is marked other included many other technologies selections and usages such as: graphing calculators, websites, scanners, desktop publishing, graphics, video editing, photo shop software, databases, digital cameras, laminator, students computers, microscopes, web design software, geometers sketch pad, and content specific software. An intern of was the difference between the uses of PowerPoint software by the HS which is used almost three times as much as it is in the MS. The rest of the technology tools are used equal at both schools without a significant difference between the two schools.

The results showed that all participants answered that they were using technology in some capacity. All teachers are embracing some form of technology. The use of technology as a support tool (49%) was the highest by all respondents. The lowest usage of technology would be in the form of direct instruction in the classroom.

Respondents were asked to rank the barrier they felt had the most influence on implementing technology. The highest response was associated with the lack of familiarity with technology. The baffler with the least response was lack of training equipment as the biggest barrier to technology use. section marked other was included to encourage participants to list any items that they felt was a very important baffler, but not included on the survey as a choice. The category marked other consisted of the following responses: too many other things are going on in the classroom at once, no CD ROM access privileges in classroom, time to prepare, no reason given, lack of time, and do not want to use technology for just the sake of using it. The respondents were very equal in regards to defining which items interfered with the use of technology in the classroom.
The staff as a whole reported that they were confident or very confident in the use of technology with a margin of 88% of the staff selecting either category. There was about 16% of the staff who were still uncomfortable with the use of technology.

Participants were asked to select all areas that applied to their training experience in technology. The strongest level of training for both schools was in the basic skills area. The other categories had no major difference in the response rates of participants. The difference between the integration of technology between the two buildings is considerable. The lack of training is a concern due to the lack of knowledge that teachers may not have had in the use of technology.

The last area on the survey was an open-ended question that asked teachers their opinions concerning the future of technology in education and where they see technology in education ten years from now. The method of collection was a qualitative analysis of the information that was given by participants. The future uses of technology that were described in this study can be broken down into some common themes.

Many respondents thought the increased use of technology by teachers would be expanded to daily use in the classroom. The increase in the number of computers in the classroom was also thought to have a role in the future uses of technology. The expanded range of technology products to include handheld devices, voice recognition and other software applications would be used by students in classrooms as well as teachers. Other respondents mentioned the development and adaptation of more web-based curriculum, on-line classes, and virtual field trips. The replacement of textbooks by technology was a statement of the future expectations of the staff.

According to one participant, "educators will rely on computers in all facets of teaching from information gathering and instruction to assessment, record keeping, filing, and communications." "Instead of textbooks driving the curriculum, teachers will engage student in technology-rich projects using teaching resources found on the Internet." "There will be much more sharing of digital resources and collaborative projects." Another respondent made the comment that "she sees teachers becoming teachers in how to find the information using technology." These comments show that teachers are aware of the role of technology in education and its importance in the future.

**DISCUSSION SECTION**

The results of the survey had some expectations that were fulfilled as well as some surprises. In regards to technology use in the classroom, it was expected that the use of Internet and electronic grade book were the highest on the list. Email and electronic grade book are both requirements by all of the teachers. In-house staff training was given on both technology tools in the last three years which may have increased the frequency of use of email and electronic grade book more than the other categories as well as it being a requirement by staff members.
According to Becker, Wong & Ravitz, "teachers who used computers outside of a class were more likely to use the following software packages: presentation, word processing, email, multimedia, CD-ROM references, graphics oriented, www browser, spreadsheet/database, simulation/exploratory, and skill games in the order listed by frequency of use" (p. 11). Another difference is the order of use by frequency varied in regards to email, Internet usage, and electronic grade book being higher on the list. Some of the items may vary as well due to the time frame in which the study was conducted and the rapid changes in the devices that are used in regards to technology.

The training methods of the participants in this study acknowledged that most training had occurred over basic skill applications. "The participants were not asked in what capacity this training occurred, just if it had happened. Bielefeldt (2001), explained that professional development was the biggest reason for incorporating technology, next to technology infrastructure, and expectations of school administration. The expectations of the school administration at these schools led to the incorporation of training in specific areas by offering in-house staff training on the specific items that are required to be used such as email and electronic grade book.

The most frequent barrier to not using technology reflected in this study was the lack of familiarity with technology. (55%) of the participant reported that they lack familiarity with technology, familiarity with technology is not anymore a major barrier in the literature. According to Bielefeldt (2001) the main barrier to using technology is the financial resources. in regards to barriers, no item has a glaring effect on all users of technology. There are many important barriers however that need to be overcome to get some changes made in the adaptation of more technology by teachers.

This study reflected that respondents were overwhelmingly confident or very confident about technology. Becker, Wong & Ravitz (2001) reported that more secondary academic teachers feel very experienced with technology. This research study was only comprised of teachers at the secondary level which may have lead to the larger number of confident technology users.

The results of this study confirm the idea that more research is needed in this area. A single study cannot chronicle teachers' practices, their behaviors, actions, and methods of using technology. The idea that all teachers in this study are using some technology is a major starting point in the implementation and integration of technology. The results in this study are limited due to the fact that not all grade levels were sampled and that some of the technology tools were not required at all levels. As the level of teaching technology requirements increases, the demand for more training and equipment will increase along with the adaptation of technology.

By examining the information of what type of technology is being used and how it is being used, leads to the assumption that technology is only being used as a support tool in this study. The results also lead us to believe that there Is a need to increase technology training so that technology does not stay as just an aide to instruction, but becomes fully integrated in the teaching and learning process.
REFERENCES


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