

RESEARCH PROPOSAL

INTRODUCTION

A recent large survey of Internet Use by Teachers directed by Henry Jay Becker (Becker, 1999) found that teachers who used constructivist pedagogies were more likely to use the Internet in their classes. There has been a movement in K-12 education toward constructivism for the last decade. New teachers are well educated in constructivist ideas and inservice teachers have also been making these changes. Many articles and studies note that technology tends to push teachers toward a constructivist-type of teaching. For some experienced teachers this is extremely uncomfortable and they tend to avoid technology. For others the experience is refreshing and gives them new enthusiasm for teaching. The purpose of this study is to determine if there is a progression that teachers experience as they attempt to integrate technology.

THIS STUDY

Teaching is one of the most isolated professions. Teachers tend to work on their own in their isolated domains (classrooms). Although teachers have always shared ideas with each other, only recently has there been more of a tendency for teachers to actively collaborate. Teachers work as individuals and come to teaching with their own philosophy and personality. There have always been differences in the ways that individual teachers approach the same grade level and curriculum. However, in the past most teachers worked from an underlying philosophy of behaviorism. (Ertmer 1993) Recently, there has been a movement from a behaviorist style of teaching to a constructivist philosophy, so that newer teachers are coming to the profession with an underlying philosophy of constructivism. This study seeks to find out if experienced teachers have changed their teaching style and if that is true has the introduction of technology played a role in this occurring. This study

is based on doing rich in-depth interviews with a selection of teachers in order to evaluate what effects the introduction of technology had on their teaching style.

Shining light on the process that teachers go through when trying to effectively integrate technology can provide guidance for administrators, Continuing Ed. Departments at Universities, technology trainers and even for teachers themselves. The study will add to the body of literature on technology integration. Listening to teachers who have experience these changes is enriching. Their experience is valuable to others who are facing the changes that technology will inevitably bring.

LITERATURE REVIEW

Who is dealing with technology in education?

Teachers at all stages (in training, K-12 grade teachers and college professors) are dealing with the need to integrate technology into their teaching. Does this change their role with students? How do teachers feel about this? Several studies explore how people at different levels adjust to technology use. One study on preservice teachers in an education program showed that the participants (preservice teachers) were amazed at the amount of technology in schools now as compared to when they went to school. (Balli, 1997) Without chances to have experiences in actual schools these preservice teachers would imagine teaching the same way that they were taught.

The ACOT (Apple Classrooms of Tomorrow) study was a longitudinal study of the effect of providing some teachers and their students computers at home and at school. (Dwyer, 1994) Teachers in this study reported working harder and longer hours, but enjoying their work more and feeling more successful with their students.

Shauna McKenna's study was designed to find out lecturers' (college teachers in Australia) prevailing attitudes toward technology and change. (McKenna, 1994) When asking if the participants saw a change in their role because of technology several responded that they saw no need for a change in their role. The participants in this survey that the lack of support for using technology made it too

stressful to pursue also expressed it.

How have teachers dealt with technology through time?

A study conducted by Harvard Graduate School of education a decade ago reveals that the process that teachers are progressing through now has not changed much. A decade after this study was done it is astounding to read research that contains the same recommendations that are echoed in Educational Technology journals today. In 1988 technology consisted mostly of Apple IIe computers used as stand alones with very little in the way of good educational software. Today we are dealing with gigabytes of hard drive space, networks and the World Wide Web. Huge changes in technologies have occurred, but teacher's perceptions remain surprisingly similar.

The Harvard Graduate School study was a telephone interview with 76 teachers from many different areas of the country seeking to find out about four things: how teachers use computers, influences on teachers' decisions about teaching technology, the effects of new technologies on teachers, and the resources and supports that teachers want. The results of the telephone survey were compiled into seven profiles of different teacher reactions to using technology. These profiles illuminated different paths that teachers take in reaction to the introduction of technology.

This particular study is worthy of modification and repetition. In ten years things have changed. Windows was introduced and computer interfaces are more user-friendly. Many more people have computers in their own homes and the Internet has become an important part of all of our lives. The questions that were used in this study are still of interest and technology has changed enough to make it almost necessary to revisit the conclusions that were found here. Whereas the 1988 study focused on 4 areas, the study proposed here is concerned instead with a progression in teaching style. The 1988 study interviewed a wide range of teachers from those who reject outright the use of technology to experienced technology users, but the proposed study is interested in a specific profile of a teacher and how that teacher has progressed. The profile for the current study is a teacher who has been teaching for many years and has successfully adapted the use of technology in his/her

classroom.

How has technology in schools changed?

The availability of technology in schools has dramatically changed since 1988. Quality Education Data (QED) has been keeping statistics on computer availability in schools for years. They sell reports to other companies who can use the information for market research. The most recent report shows that in spite of significant increases in the number of computers in schools, teachers are still not using technology to its capacity. Many of the teachers who are considered to be the top users of technology in schools principally use the equipment for word processing and other basic tasks. The Milken Exchange on Educational Technology Report (1998) also supports this fact. This was a large survey sent out to 21 different states and filled out by District Technology Coordinators. They say “Teachers everywhere have a long way to go before they can be described as using technology in the most sophisticated ways”.

Are there studies that show the effect of age and experience on technology use?

In the report cited at the beginning of this paper Henry J. Becker (Becker, 1999) makes comparisons from an immense amount of data collected from over 2000 teachers in 1998. One comparison showed what effect years of teaching experience and age had on technology use in the classroom. The report showed that duration of teaching experience has a small relationship to the value given to Internet use by teachers and that in fact teachers with less than four years of experience were slightly less likely than more experienced teachers to use technology. The younger, less experienced teachers are more likely to use the Internet professionally however.

What causes teacher resistance to technology?

Many researchers have done studies to find out what causes the resistance that is observed in teachers when it comes to technology. Morton did a study in Sydney, Australia and came to the conclusion that there is significant variation between teachers in their attitudes toward technology. The study revealed that teachers see technology in different ways and that those contribute to how they

use the equipment. Some teachers place importance on learning “about” technology and how to use computers. Other teachers see technology as a tool to be used for learning and teaching. Morton’s conclusion was that those teachers who see the computer as a tool are more likely to use it with students and to be catalysts with other students.

In a recent article by Larry Cuban in Education Week the fact that many teachers are now using computers regularly at home, but still not attempting to use them with their classes is explored. (Cuban, 1999) The article suggests five areas that offer explanations: Contradictory advice from experts, Intractable Working Conditions, Other demands (subject knowledge, discipline), The inherent unreliability of the technology, and Policymaker’s disrespect for teachers’ opinions. Although this is not an actual study it provides guidance in writing questions and interviewing teachers for the present study.

Many of these studies come to the conclusion that teachers lack training and the time needed to develop comfort using technology. Chin and Hortin in a meta-study that compiled conclusions from many different studies suggest that teachers’ roles need to change for technology to be effectively used. It takes time for cultures and roles to change and factors like administrative support and the right kind of staff development need to be available to make it happen.

John W. Saye made a final observation. He proposes that teachers are predispositioned to take risks and adopt technology or to assimilate it without changing. He uses the term “accidental tourist” to describe a teacher that only uses technology where it fits in with the old way of doing things. These people do not want to change, so they adjust the environment (in this case-technology use) to be comfortable. There are others who are risk takers. They were risk takers before they used technology and now they are making great strides in technology use because of this trait. These people are willing to try new things and can deal with the stress that it entails. In his study, which was a long-term qualitative study of teachers from a small school, he interviewed and observed these teachers over two years. Although the same technology, support and training were available to both groups

the risk takers thrived on all of the changes that technology brings and the “accidental tourists” assimilated what they could into their old style.

This view is a contradiction of the opinion held by many researchers that use of technology moves a teacher toward constructivism. Could it be that technology moves teachers that were already predisposed to move that way further into constructivism, but does not have that effect on all teachers or the school culture? He also brings up the point that some research has found that teachers may retreat from innovation that their students resist. Understanding that interaction between teacher and student seems important also.

So, we have established that teachers of all levels are dealing with the changes that technology brings. It takes time and good staff development to make a difference. Technology has changed faster than any other method or tool that teachers use. We need to equip teachers to deal with this, but how? If John W. Sayes position is accurate then there is little we can do to change teachers and we will just have to wait for the inevitable retirement and hiring of more risk taking teachers before we will see real change in schools. This study will answer some of these questions for a certain sample of teachers. It is hoped that it will be a catalyst to help professionals involved in educational technology to understand better the process of technology integration.

PROBLEM STATEMENT

The question that we are seeking to answer is: “What are some common features of more experienced teachers who have become effective with using technology?” Based on earlier studies, especially on the recent findings of Henry J. Becker, the expected hypothesis is that these teachers have moved from a behaviorist style of teaching to a more constructivist style. If this is the case the study seeks to illuminate common steps that these teachers took on their way to successful technology use. These steps may be of help to teachers in this situation and especially to anyone who plans staff development activities.

METHODS AND PROCEDURES

A snowball method will be used to develop a list of names of teachers who would fit the profile and be willing to answer the survey. The first requests will go in a letter to principals in the surrounding school districts. The letter will ask them to recommend teachers with more than 10 years of experience whom have changed their teaching style and effectively integrated use of technology with their classes. The teachers recommended will be approached and asked for further recommendations. Because this study is seeking rich and in depth information it will involve a maximum of 20 participants. This sample will be manageable for interviewing and observations. If it is possible a professor in another state could follow the same procedure at the same time so that the results could be compared.

The teachers will be mailed a survey, which will ask for demographic data as well as a series of questions about the process of integrating technology. The survey will be mailed out with a date two weeks from that mailing as the deadline for returning the survey. When three weeks have passed reminder cards will go out to those who did not send their survey back. In two more weeks calls will be made to retrieve the remainder of the surveys if necessary. There should be a high rate of return since the participants will have agreed to participate in the first place. Most of the survey questions will use a likert scale, but there will be a few short answer questions to clarify the numbers that were chosen in the likert scale. This survey will be used as a springboard for personal interviews of each of these teachers. Based on the results of the survey a list of more specific questions will be developed, which can be asked of all of the participants. The interviews will be open-ended. They will follow the guidance of the questions that were developed earlier, but if there are fruitful areas to explore that are not included in the prepared questions the interviewer will pursue them.

These conversations will be taped and transcribed. The data will then be analyzed. A comparison will be made of the experiences of the participants. Similarities will be noted and if possible the observations will be put into a scheme to illustrate the process of adjusting to technology. These results will be written up into a report. Any data that can be graphed will be shown in graphs and

discussed. A composite timeline to illustrate the stages that teachers went through will be created if the hypothesis is supported.

Budget

| ITEM | EXPLANATION | COST |
|---|--|--------|
| Hired work hours | Preparation of survey, Transcription, \$8/hour | \$1500 |
| Office Supplies \$200 | Paper, pens, stapler and staples, paper clips, file folders | |
| Xeroxing \$50 | Copies of survey, copies of correspondence and final report. | |
| Principal Investigator Time | Hourly (salary and benefits provided by University) | \$3000 |
| | | |
| Postage | Initial mailing of the surveys, reminder postcards, and correspon- | |
| | | |
| dence with publisher. | \$50 | |
| | | |
| Utilities, equipment cost heat. | Use of office space, phone, computer equipment, lighting, and | |
| | \$200 | |
| Mileage (\$.31/mile) | Estimate of total Number of Miles <u>1000</u> | \$310 |
| TOTAL ESTIMATE | | \$5310 |

DISSEMINATION

The results of this study will be of interest to a large number of researchers and practitioners. A conference, which brings both of these roles together, is the NECC conference. The results will be prepared for a presentation at this conference. A summary of the findings in a narrative style will be written and published in Educational Leadership. This article will be aimed at reaching administrators and staff developers who can apply what is found. Finally, a version of the results will be published on the Internet with the help of the TappedIn staff (Virtual Office for Ed. Technology at <http://www.tappedin.org>) who will recommend the best way for it to be web published.

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(Note: I am under the impression that although WWW publishing is suspect because there is no peer review, it is also affordable. This report was thorough and included a section of at least 10 pages of graphs. I think that the reports I got out of Journals were much more limited.)

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Draft Survey

This is a draft to give an idea of the type of survey that could be used. Because of my limited knowledge in how to design a useful survey I realize that it is not useful in its present form.

Name _____ Age _____ Grade Level Presently Teaching _____

Years of teaching experience _____ Years of teaching experience using technology _____

Please use the statements in the following section to demonstrate your experience and feelings about teaching:

1. I went into teaching because it seemed easier than other careers.

Agree Strongly 1 2 3 4 5 Disagree Strongly

2. I believe students should be rewarded for their achievements.

Agree Strongly 1 2 3 4 5 Disagree Strongly

3. Teaching is harder than I thought it would be.

Agree Strongly 1 2 3 4 5 Disagree Strongly

4. A teacher should view him/herself as someone who provides rich resources for students to learn with.

Agree Strongly 1 2 3 4 5 Disagree Strongly

5. It bothers me when I do not know the answers to questions that students ask.

Agree Strongly 1 2 3 4 5 Disagree Strongly

6. When technology was first introduced I didn't think I could learn.

Agree Strongly 1 2 3 4 5 Disagree Strongly

7. Adding technology to all of the things that my grade must accomplish is difficult.

Agree Strongly 1 2 3 4 5 Disagree Strongly

8. Students should be evaluated with rubrics and portfolios to show what they have actually learned.

Agree Strongly 1 2 3 4 5 Disagree Strongly

9. I have changed my teaching style since I added technology.

Agree Strongly 1 2 3 4 5 Disagree Strongly

10. Memorizing facts is less important than helping students to construct their own understandings.

Agree Strongly 1 2 3 4 5 Disagree Strongly

11. Students should be quiet and work on their own.

Agree Strongly 1 2 3 4 5 Disagree Strongly

12. Using technology takes more time than teaching in a traditional way.

Agree Strongly 1 2 3 4 5 Disagree Strongly

13. I plan projects where students need to solve problems and work together for a solution.

Agree Strongly 1 2 3 4 5 Disagree Strongly

14. In my classroom I encourage students to develop their own learning strategies.

Agree Strongly 1 2 3 4 5 Disagree Strongly

15. Using technology in the classroom is difficult because it distracts other students.

Agree Strongly 1 2 3 4 5 Disagree Strongly

Please give a short statement about why you became a teacher.

Describe shortly your first memory of using technology in your lessons.

Was there a turning point for you in using technology? If so, please describe it.

What types of things encouraged your progress in using technology with your students?

What things made it difficult for you to succeed in using technology to learn?

Describe one time that you saw technology make a difference in the learning of a student.

If you were to draw your path toward using technology successfully in your classroom what would it look like? (See the sample timeline)