Faculty Beliefs about Teaching with Technology

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Introduction

The rapid growth of instructional technologies has provided college faculty with a vast array of educational resources and learning opportunities (Grasha, 2000; Kagima & Hausafus, 2001). As described in the relevant literature addressing this issue, there are several potential advantages in utilizing instructional technologies to enrich the educational experience. For example, McKenna, Avery and Schuchardt (2000), identified numerous potential advantages from integrating technology into instruction, including increasing the opportunity for individualized learning by students, offering a new way of thinking and communicating for both students and professors, expanding the emphasis on problem-solving, and enabling the learning of higher-level skills including, embedding learning in relevant contexts, critical thinking, goal-setting, planning and self-monitoring. Kagima and Hausafus stressed that incorporating technology into teaching methodology allows educators the flexibility to tailor educational resources to accommodate diverse learning styles, cultural differences, skill levels, motivations, disabilities, and educational objectives.

Additionally, DeSieno (1995) noted three advantages of integrating technology in the teaching-learning process. The first notable advantage is that, the learning environment is transformed and information becomes more vivid, instructive, and focused upon the immediate needs of students. The second advantage noted by DeSieno was that, the use of technology can encourage students to become more responsible for their own learning. A final advantage is that technology can assist students in learning the fundamentals of a specific subject, thereby freeing faculty to concentrate on working with students in mastering the more complex aspects of their courses.

Despite the existence of these advantages, relatively little attention has been focused on how teachers' views of learning affect the ways they use technology in the classroom (Futon, Torney-Purta, 2000). This research study attempts to examine this question by focusing on the relationships among pedagogical beliefs and teaching styles, as well as examining the relationship between faculty beliefs about teaching with technology and teaching strategies.

Teaching styles and technology usage

Teachers have preferred teaching styles, with which they are comfortable and to which they can easily revert. While some researchers equate teaching style with teaching method or technique, Heimlich and Norland (2002) emphasize that most researchers define teaching style as a predilection toward teaching behavior and the congruence between an educator's teaching behavior and teaching beliefs. Numerous models of teaching styles are available, including the five styles outlined by Grasha (1996), which are expert, formal authority, personal model, facilitator, and delegator. Each teaching style is associated with particular teaching roles, attitudes, and teaching strategies. Furthermore, several authors assert that effective teaching requires a melding of teaching and technological expertise, meaning that teaching and technology are becoming increasingly co-dependent (Pierson, 2001; Woodbridge, 2003). Pierson stresses that technology expertise does not always relate to teaching expertise, nor does good teaching always translate into effective technology use. Jacobsen (2000) advocates the position that learning how to teach with technology requires imagination, intellect, and creativity.

Learning theory and technology's role

The teacher-centered classroom illustrates the behaviorist approach to teaching and learning. According to behaviorist learning theory, learning is a change in behavior due to experience or environment. Experience is the product of building associations between the occasion on which the behavior occurs and the behavior itself. Under behaviorist theory, desired responses are rewarded and thereby reinforced, which leads to their repetition. This model of instruction fits within the traditional transmission model of teaching and learning. Transmission pedagogy derives from a conventional theory of learning in which understanding occurs from carefully planned instruction on a narrowly-defined skill or content topic and guided practice on questions related to that topic. Fulton & Torney-Purta (2000) define the transmission model as a pedagogical approach in which teaching is telling and learning is listening.

Constructivist views of learning focus on knowledge construction. Under this theory of learning, knowledge is not passively accumulated, rather learning results from active cognizing by the individual, using

processes such as abstraction, reflection, and the creation of knowledge structure. Proponents of this theory emphasize that knowledge acquisition and meaning making cannot simply be transferred from one individual or group of individuals to another, but rather, the construction of knowledge and the making of meaning are individually and socially constructed. Thus, individuals use active processes to create their knowledge and meaning of the world. The foundation of constructivism is the field of cognitive learning theory. Researchers such as Piaget and Vygotsky, extrapolated their findings in cognitive development to encompass influences from the learner's environment, including the role of the instructor and other social, cultural, or historical factors. Technology use stemming from this framework emphasizes inquiry, simulations, and the development of on-line learning communities (Fulton & Torney-Purta, 2000). Constructivists argue understanding cannot be transmitted, nor does skills-practice result in understanding that can be automatically applied, as needed. Instead, constructionists believe effective teaching involves creating environments in which students take mindful effort towards developing their understanding and have opportunities to learn how to apply their knowledge and when to do so. Computers can be effectively utilized within instruction based on a constructivist model of learning. For example, presentations to a critical audience, integrating different perspectives in a report or multimedia document, or examining contrary assumptions using a spreadsheet model.

Faculty type and technology usage

Hagner (2001) identified four types of faculty, first-wave (self-starters), second-wave (traditionalist), third-wave (careerists), and fourth-wave (reluctants). The following are characteristics of first wave faculty: (a) they work in more technologically supportive environments; the impetus for their enterprise is internal, (b) they share a strong interest in bettering the quality of the education delivered and the learning produced, (c) they possess sufficient expertise to give them the confidence to proceed, (d) they are not motivated by standard academic incentives, and (e) their expressed disappointment may influence the extent to which they will continue their integration and perhaps more importantly, share their positive experiences with their colleagues. Characteristics of second-wave faculty include: (a) fear of the unknown, (b) "If it Ain't Broke…", (c) "We're all alone in this together", (d) "Know Thyself" – Adoption to new teaching environments represents a major commitment on the part of the faculty member to re-evaluate their own personal approach to learning, and (e) they like the sexy technology, but fail to seek out new ways to use hardware or software to expand their teaching repertoire. Third-wave faculty are the type that will emerge when universities change their reward structures in the tenure and promotion process; they are the teachers who see adopting technology as a means of advancing their professional careers. Fourth-wave faculty are either computer illiterate or those who firmly believe in the superiority of traditional models of learning.

Purpose

The purpose of this study was to examine relationships among pedagogical beliefs and teaching styles, as well as examining the relationship between faculty beliefs about teaching with technology and teaching strategies. The following served as guiding questions:

1. What is the relationship between personal beliefs about integrating technology and teaching styles?
    a) How do instructional technologies fit into a teacher's philosophy of teaching?
    b) What do teachers see as the major influences on beliefs about teaching and technology integration?
2. Do instructional technologies play a significant role in teachers' instructional strategies?
    a) How do teachers use instructional technologies in their instruction?
    b) What teaching strategies do teachers find effective in integrating technology into instruction?
    c) How do teachers' beliefs about their teaching practices correspond to their beliefs about how technology should be used in the classroom?

Methodology

Research design paradigm

This study utilizes a qualitative research paradigm and employs a case study methodology to examine relationships among pedagogical beliefs and teaching styles, as well as examining the relationship between faculty beliefs about teaching with technology and teaching strategies. The methodological design was chosen based on the alignment between the research questions and the data collection methodology. Law, Stewart, Letts, et. al (1998) state that qualitative research designs seek meaning and understanding and usually involve the in-depth exploration of a topic, emphasizing seeking information from the people who are involved. Thus, case study methodology

allowed the researcher to interview faculty members in their office environments providing the researcher with an insider's view into the complexities of a faculty member's natural habitat of learning and teaching.

Establishing rigors of the study

To increase internal validity, the following strategies were employed: triangulation of data, member checking, peer examination, participatory modes of research, and clarification of researcher bias (Creswell, 2002). Triangulation of data was accomplished through collecting data from multiple sources including interviews, field notes, and document analysis. Member checking involved returning an interview transcript prior to analysis to the participant to obtain their validation and approval. Participants were encouraged to make modifications, additions, or deletions to the transcribed record. A research peer debriefing team of doctoral students (n=4) served as peer examiners. Additionally, the researcher's beliefs and practices concerning whether the presence of instruction technology in the classroom is associated with variations in teaching styles and strategies, may potentially shape the way collected data is viewed, understood, and interpreted therefore a field log and a reflexive process was utilized to record researcher personal values, assumptions, and biases.

Bounding the study

The study was conducted on the campus of a small liberal arts college (SLAC) founded and located in the southern United States. The college is located in a rural Southern community. The institution enrolls over 1,300 students at two locations, with a main campus enrollment of 800 students and an off-campus location enrollment of approximately 500 students. Originally accredited as a junior college in 1927, the institution transitioned to a four-year institution in 1992.

Participants

Creswell (2002) argues in order to best help the researcher understand the problem and the research questions, participants should be selected purposefully. Therefore, a purposeful sample of information-rich key informants representing a range of disciplines (i.e., three business participants, one math participant and one behavioral science participant.) was drawn to obtain a more in-depth picture of teaching philosophies and beliefs about teaching with technology. The select group was diverse in terms of technology access, as well as student population. The participants consisted of four males and one female. Three participants held the academic rank of Associate Professor; one held the academic rank of Assistant Professor and one held the academic rank of Professor. Two participants had six to ten years of academic experience while three participants had more than 15 years experience.

Data collection strategies

Data collection occurred between January 2004 and May 2004. Data collection instruments included a field log, survey instrument (Appendix A) that included demographic information, questions about teaching philosophy, and specific technology usage, and semi-structured face-to-face interviews (Appendix B). To assist in the data collection phase, the researcher utilized a field log to record details of the researchers' thoughts, feelings, experiences, and perceptions throughout the research process (Creswell, 2002).

The interview procedure was semi-structured and open-ended in nature in order to be responsive to emergent topics and themes. Open-ended interview questions were used to provide rich qualitative data about the influence of instructional technologies on teaching styles. The primary objective of the interviews was to record, analyze, and interpret the individual college faculty member's experiences, opinions, and perspectives with regard to instructional technologies, teaching philosophy and strategies. The initial interview took approximately 45 minutes to complete and was conducted with the aid of an interview guide. The interview guide addressed teaching style, and methods for using and integrating technology in teaching. Interview times were arranged based on the participant's request and the researcher's availability. Interviews were audio recorded and transcribed verbatim. Prior to analysis, the interview transcripts were returned to participants for validation and approval. Participants were encouraged to make modifications, additions, or deletions to the transcribed record.

The anonymity of the interview participants in this research and subsequent potential publications was protected using the following methods; the use of a pseudonym; and the use of audio recordings, transcripts, and observational notes which were maintained in the researcher's secure files throughout the research process. All artifacts were coded, so that no personal identifying information was visible and audio recordings were listened to by the researcher.

Data analysis

Data analysis for the interviews was inductive and the overall data analysis strategy employed a constant comparative methodology (Glaser & Strauss, 1967). Glaser and Strauss identified four stages of constant comparative analysis: compare the incidents, compare the incidents within each category, reduce the categories to a smaller number and begin to develop a framework for understanding the data and begin thinking in terms of theory based on the coded data.

The interview data was scanned for similarities and anomalies. Initially, a list of repeated words, phrases and ideas were coded in the margins of the transcripts. The data was analyzed into themes suggested by the data, to identify units of information from which broad categories were identified. This open-coding methodology allowed complete examination of thoughts and helped focus the analysis (Creswell, 2002). Throughout the analysis process, the research questions were revisited and the data was reviewed for convergence and divergence. The research participants performed member checks on the transcripts.

Results

Cross-case analysis

The following underlying questions were posed by the study. What pedagogical philosophy guides American college faculty? Do college faculty believe in the traditional instructional model of whole class structured explanation, guided practice, and a common curriculum contained in textbooks? By comparison, do college faculty believe that a learning process which stresses student interest, initiative, and "sense-making" is more important than a particular curriculum and see themselves more as a facilitator and resource provider, than a source of content knowledge for students? The results revealed that fewer teachers professed to believe in the traditional, fixed-curriculum, fact, and skill-oriented model of teaching and instead the majority of the faculty members supported a more constructivist teaching philosophy.

Traditionally, teaching practice has been characterized by an emphasis on skill and knowledge transmission from teacher to students. By contrast, constructivist theorists argue that understanding is derived from a person's effortful activity to integrate newly communicated claims and ideas with his own prior beliefs and understandings. To examine this argument empirically, the survey incorporated a set of questions designed to measure their philosophical preference between transmission- oriented teaching and constructivist-compatible teaching. Table 1 represents the alternative statements of teaching philosophy (Becker, 2001).

Table 1 *Transmission – Constructivist Philosophy Continuum*

Transmission Philosophy	Constructivist Philosophy
Continuum	
Explainer Students really won't learn the subject unless you go over the material in a structured way. It's my job to explain, to show the students how to do the work, and to assign specific projects.	**Facilitator** I mainly see my role as a facilitator. I try to provide opportunities and resources for my students to discover or construct concepts for themselves.
Curriculum Content The most important part of instruction is the content of the curriculum. The content is what students need to know and be able to do.	**Sense-Making** The most important part of instruction is that it encourages 'sense-making' or thinking among students. Content is secondary.
Curriculum Content While student motivation is certainly useful, it should not drive what students study. It is more important that students learn history, math, and language skills in their textbooks.	**Interest Effort** It is critical for students to become interested in doing academic work-interest and effort are more important than the particular subject matter they are working on.
Whole Class Activities It's more practical to give the whole class the same assignment, one that has clear directions, and one that can be done in short intervals that match student's attention spans and the class schedule.	**Multiple Activities** It is a good idea to have all sorts of activities going on in the classroom. It's hard to organize, but the successes are so much more important than the failures.

Table 2 provides information on about how much teachers' beliefs were aligned with a set of two statements about teaching philosophies. There were seven possible responses for each item. The series of paired statements was preceded by the following statement:

> Different teachers have described very different teaching philosophies to researchers. For each of the following pairs of statements, check the box that best shows how closely your beliefs are to each of the statements in a given pair. The closer your beliefs to a particular statement, the closer the box you check.

Table 2. *Transmission vs. Constructivist (n=5)*

	Transmission Philosophy				Constructivist Philosophy		
	Strongly Agree	Moderately Agree	Agree	Neutral	Agree	Moderately Agree	Strongly Agree
Explainer/Facilitator				1	2	2	
Content/Sense-Making					2	3	
Content/Interest		1	3	1			
Whole class activities/ Multiple activities			1	1	1	1	1

Overall, the five case study teacher responses were predominately in accordance with the constructivist philosophy and these views were similarly reflected in the interviews. Teacher 2 was very supportive of the constructivist viewpoint (facilitator) by noting "I have always perceived my role as a teacher to be that of a "tour guide," leading the students on a learning journey in the subject/courses. Technology allows us to have a more interesting and enriching "tour" experience." Additionally, Teacher 1 noted, "learning should be less teacher-centered and more student-focused." The only variance in the constructivist approach was the value of particular content covered in textbooks over student interest and effort in academic work.

Faculty type and technology usage

Teachers 1, 4 and 5 are first-wave or self-starter types. For example, Teacher 1 noted, "I am intrinsically driven to use technology" and "technology works very, very well because it lets students do independent investigation, so that they can discover things on their own, without having to be told that a particular thing is a particular way." Teacher 4 stated, "I just kinda have an affinity for that environment [technology]"

and

> It's kinda like speed reading a book I try to look at what's there and how it works and then get a little deeper into the parts of it that I'd be more interested in and then try to figure out what there is that I don't know how to do the nuts and bolts of it.

Teacher 5 related that

> I had my first full-time regular teaching appointment as a visiting assistant professor and it [technology] was available and … I quickly became someone who was a heavy user of this technology and would, you know, go to the IT department a lot and say I need this, I need that, can you do this for me.

Teacher 3 represents a second-wave or traditionalist faculty type as reflected in the statements that follow

> (a) it [technology] has to be scientific, valid, reliable data to support my doing it, and (b) unless someone provides me with some training or ideas how, it's just a trendy thing to do, and (c) I recently attended a workshop at unnamed university where they talked extensively in sharing materials, books, but no real discussion of technology was conducted—nobody seemed to be discussing or enamored with technology as part of their teaching processes

Teacher 2 represents a third-wave or careerist faculty type as shown by the following statement

> Technology provides me with survival and continued growth as a professional educator. I see Computer Assisted Instruction as retirement vehicle for me personally. This delivery system for higher education is not a FAD, but in reality the future. We probably will always have brick and mortar course delivery systems, but the online feature is growing significantly. Institutions of higher education, who do not embrace the CAI, at least as a means of augmenting their on ground practices, will find themselves left in the "dust," so to speak.

Teaching strategies

The second set of questions used for analysis concerns teaching strategies because the way that a faculty member uses computers indicates his or her underlying pedagogical philosophy. Grasha (2000) believes that current

and future users of technology should be concerned about instructional method bias that is "a tendency to select teaching processes because the structural features associated with them are personally attractive" (p. 2).

The case study participants believe themselves to be effective and to possess the competency to influence student learning. Their varying beliefs about faculty roles were demonstrated in their customary classroom practice using technology. Faculty reported to have students build understanding through using hands-on activities. The more constructivist teachers described ways that technology use supports their beliefs. For example, Teacher 1 stated, "…when it [technology] is used effectively, students can be actively involved and manage their own learning. They can discover for themselves." Teacher 4 believes "the use of technology allows more "active learning cycles" for students." Teacher 5 stated they "used technology to appeal to different learning styles and to make concrete the concepts." Finally, Teacher 2 incorporates technology in teaching through the "use of multi-media approach to teaching, from film, overheads, videos, and now – the internet, with just-in-time use of company web-sites to reinforce content and bring current relevance to the discussion."

Major influences on teachers' beliefs about teaching and technology

The major factors mentioned by the teachers were pressure from colleagues, students, and outside sources. Teacher 3 noted, "I have a constant reinforcement by a colleague of mine who harasses me to use technology and also because now that I do it I find it fun" and

> I decided that in order to be in the 21st century as a professor and since I was telling my students they have to use PowerPoint's I figured I'd use it myself…PowerPoint's not new and interesting anymore to students and you know since the students are of a generation of computers and etc you gotta make things more entertaining for them and I don't think PowerPoint as I am using it is particularly entertaining.

Teacher 5 noted that the administration put pressure on faculty to integrate technology, by stating that, "I mean it [technology] was an institutional expectation that faculty would come to use technology." Teacher 5 also discussed how easily textbook publishers are catering to technology usage through the development of PowerPoint presentations.

> …faculty becoming extensions of computer programs…the publishers are putting out a whole package this is how you teach the course and all you have to do is stand there and push the buttons and ask the questions that are pre-programmed into the PowerPoint's.

Discussion and Recommendations

This study provides insight into how a diverse number of teachers have begun to use instructional technologies in their instruction, and examines the relationship between personal beliefs about integrating technology and teaching styles and strategies. The case study interviews indicate that faculty views of learning and teaching noted in the surveys and interviews are reflected in the ways they use technology in the classroom. Views of learning and goals for instructional technology use, varied among the five teachers in the case studies, ranging from constructivist views for teaching and instructional technology use, to a neutral perspective. All faculty stated that they have used technology to support their teaching in ways they felt are appropriate. Each teacher offered several examples of how they use technology in a way that meshes with their teaching philosophy. The preferred teaching strategies and styles of teachers determined or shaped patterns of technology usage. Fewer faculty professed to believe in the traditional, fixed-curriculum, fact and skill-oriented model of teaching and instead supported a more constructivist teaching philosophy. This finding is incongruent with current literature. According to Bennett & Bennett, (2002) most faculty members conduct a teaching-centered classroom instead of learner-centered classroom. Examining the institution, where the study was performed may account for this incongruence. Liberal Arts educators seek "to empower our students to become lifelong learners and creative and critical citizens of a media-intensive world" (Scott, Chenette, & Swartz, 2002), thus a liberal arts education is more likely to consist of a learner-centered classroom. Also, it is interesting to note that first-wave faculty held constructivist views for teaching and instructional technology use while second-wave and third-wave faculty held to a more neutral perspective.

Before an institution can begin to support faculty-integrating technology into instruction, the institution must first determine their mix of faculty types, first-wave (self-starters), second-wave (traditionalists), third-wave (careerists), and fourth-wave (reluctants), because the strategy needed to support technology integration into instruction will differ among types of faculty.

For example, why should faculty integrate technology into their teaching if they cannot use it daily? Getting excited about using a new technique does not translate into being able to use it effectively. In order to increase the use of technology in the college classroom, college administrations need to make the technology readily available before asking faculty to learn and adopt it. College administrations need to develop a process by which

first-wave faculty would be empowered to integrate technology through grants (to buy more hardware and software) and release time arrangements.

Second-wave faculty need a series of staff development workshops to promote the integration of technology into the college classroom. This series of workshops would begin with learning how to use technology to teach (specifically how each discipline can use the technology) and proceed to learn how to use the basic tools of technology, and progress to intermediate workshops on integrating technology into instruction. This series would run continuously, with more than one level being offered simultaneously. Release-time arrangements and stipends might be provided to stimulate faculty participation. At the same time, to be effective in promoting the use of technology the college administration would need to provide the basic hardware and software for second-wave faculty in every office and classroom. At this point, first-wave faculty would be able to piggyback their applications and uses onto the available technology.

Successful teaching requires that teachers be able to address learners' needs and understand the variations in learners' styles and approaches. Teachers can accomplish these requirements by utilizing a variety of teaching strategies and teaching styles. The teachers' teaching philosophy plays a role in determining how technology will be integrated into instruction and understanding current instructional technology uses and beliefs of faculty provides a plan of action that supports effective responses. Rather than viewing technology as merely a tool for delivery, higher education should view technology as a means to improve learning (Wilson, 2003). Future studies are needed to continue developing a knowledge base about the interaction between personal beliefs of using technology and teaching strategies, the relationship of technology to teaching styles and the implications for the teaching styles adopted by faculty members.

Appendix A

Technology and Teaching Style

Participant Information

1.	What is your age?	
	?	Under 25
	?	25 to 34
	?	35 to 44
	?	45 to 54
	?	55 to 64
	?	65+

2.	What is your gender?	
	?	Female
	?	Male

3.	What is your academic rank?		
	?	Instructor	
	?	Assistant Professor	
	?	Associate Professor	
	?	Professor	
	?	Other	_____

4.	At which higher education institution are you a member of an academic staff?	
	_____	

5.	Which department/school do you hold your appointment?	
	_____	

6.	How many years have you taught at your current higher education institution?	
	?	Less than 1 year
	?	1-2 years
	?	3-5 years
	?	6-10 years
	?	11-15 years
	?	More than 15 years

7.	How many years have you taught throughout your higher education career?	
	?	Less than 1 year
	?	1-2 years
	?	3-5 years
	?	6-10 years
	?	11-15 years
	?	More than 15 years

8.	What is the average number of students that you teach in one term?	
	?	10-20
	?	21-30
	?	31-50
	?	51-100

8.	What is the average number of students that you teach in one term?	
	?	101-150
	?	More than 150

9.	How often do you use the following technologies?						
		Not available to me	Available but never use	Available but rarely use	Use monthly	Use weekly	Use daily
	Email at school?	?	?	?	?	?	?
	Email at home?	?	?	?	?	?	?
	A listserv?	?	?	?	?	?	?
	WWW resources at school?	?	?	?	?	?	?
	WWW resources at home?	?	?	?	?	?	?
	Other Internet resources (telnet, ftp, etc)?	?	?	?	?	?	?
	A word processor?	?	?	?	?	?	?
	A spreadsheet program?	?	?	?	?	?	?
	A database program?	?	?	?	?	?	?
	Presentation software?	?	?	?	?	?	?
	A web page editor?	?	?	?	?	?	?
	Distance learning?	?	?	?	?	?	?
	Desktop publishing?	?	?	?	?	?	?
	An authoring package?	?	?	?	?	?	?
	Computer-based instruction?	?	?	?	?	?	?
	A digital camera?	?	?	?	?	?	?
	A scanner?	?	?	?	?	?	?
	Video conferencing?	?	?	?	?	?	?
	WWW chat rooms or bulletin boards?	?	?	?	?	?	?
	WebCT, Blackboard or other instructional tool?	?	?	?	?	?	?

10. Different teachers have described very different teaching philosophies to researchers. For each of the following pairs of statements, check the box that best shows how closely your beliefs are to each of the statements in a given pair. The closer your beliefs to a particular statement, the closer the box you check.

"I mainly see my role as a facilitator. I try to provide opportunities and resources for my students to discover or construct concepts for themselves."							"Students really won't learn the subject unless you go over the material in a structured way. It's my job to explain, to show the students how to do the work, and to assign specific projects."
	?	?	?	?	?	?	?

"The most important part of instruction is the content of the curriculum. The content is what students need to know and be able to do."							"The most important part of instruction is that it encourages 'sense-making' or thinking among students. Content is secondary."
	?	?	?	?	?	?	?

"Students must learn basic skills before they can master complex content."							"Students can learn basic skills in the context of mastering complex content."
	?	?	?	?	?	?	?

"It is critical for students to become interested in doing academic work-interest and effort are more	"While student motivation is certainly useful, it should not drive what students study. It is more

important than the particular subject matter they are working on."	?	?	?	?	?	?	important that students learn history, math, and language skills in their textbooks."

"It's more practical to give the whole class the same assignment, one that has clear directions, and one that can be done in short intervals that match student's attention spans and the class schedule."	?	?	?	?	?	?	"It is a good idea to have all sorts of activities going on in the classroom. It's hard to organize, but the successes are so much more important than the failures."

Thank you for participating in this survey.

Appendix B

Technology and Teaching Style Interview Guide

Teaching Style

1. What is your philosophy of teaching?
2. Describe your teaching style.
3. How does technology fit into your philosophy of teaching?
4. How does technology fit into your style of teaching?

Methods for Using and Integrating Technology in Teaching

1. What initially prompted you to use technology as a teaching strategy?
2. How did you learn to apply technology in your teaching?
3. Describe ways in which you have integrated technology into your teaching.
4. How does integrating technology change your role as the teacher?
5. What specific changes to your teaching resulted from integrating technology in your teaching?
6. What is the most compelling reason for using technology in the classroom?
    a. For not using technology?
7. What motivates you to integrate technology into teaching?
    a. Please give a specific example
8. What incentives drive you to integrate technology into teaching?
    a. Please give a specific example

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