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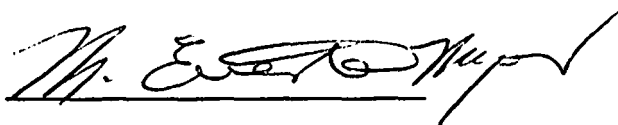
I am submitting herewith a dissertation written by Vicki Sells-Lewallen entitled "Concerns of Liberal Arts Faculty toward Instructional Technology." I have examined the final copy of this dissertation for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Doctor of Education, with a major in Education.


E. Dale Doak, Major Professor

We have read this dissertation
and recommend its acceptance:







Accepted for the Council:


Associate Vice Chancellor and
Dean of The Graduate School

**CONCERNS OF LIBERAL ARTS FACULTY
TOWARD
INSTRUCTIONAL TECHNOLOGY**

**A Dissertation
Presented for the
Doctor of Education
Degree
The University of Tennessee, Knoxville**

**Vicki G. Sells-Lewallen
May, 2000**

DEDICATION

This dissertation is dedicated to my family:

my children,

Elyas and Mariam Bakhtiari,

my husband, Darrell,

and to my parents,

Howard and Martha Sells,

who have made it all possible and worthwhile.

ACKNOWLEDGEMENTS

There are many people who have made this work possible. I am particularly grateful to Dr. E. Dale Doak whose constant support and encouragement has sustained me throughout my program of studies at the University of Tennessee.

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Lastly, a deep debt of gratitude is owed to the many friends and family members who were always ready to lend encouragement and moral support to my efforts.

ABSTRACT

In this study, the concerns of liberal arts faculty members toward the use of instructional technology were explored. The Concerns-based Adoption Model developed at the University of Texas in Austin provided the methodological framework for determining the concerns and attitudes of liberal arts faculty toward the use of instructional technology. The Stages of Concern Questionnaire, an instrument based on the Concerns-based Adoption Model provided the vehicle for gathering data. The survey, open-ended questions, and demographic information obtained from respondents at the University of the South in Sewanee, Tennessee formed the basis of this research study.

Findings of this study included the determination of the peak Stage of Concern of faculty at the University of the South. The peak concern for 26% of the faculty respondents was at Stage 3—Management, a task-related concern. Stage 1—Information, a self-concern was the second peak stage with 25% of respondents. Demographic data were examined to determine relationships between the observed and expected distribution of faculty utilizing a Chi-square measurement. Significant relationships were determined to exist between academic rank, age range and peak Stage of Concern. Positive tenure

status was determined to relate to the likelihood of peak concern at Stage 3--Management while lack of tenure respondents were more likely to have a peak Stage of Concern at Stage 1--Informational. Level of use information gathered in the survey determined that frequency of use (significant at $p = .02$) and participation in training (significant at $p = .01$) as significant predictors of peak stage of concern.

The open-ended question related to the advantages of using instructional technology revealed that visualization and presentation of information, student motivation, and access to increased amounts of information were important factors to liberal arts faculty using instructional technology in teaching. The disadvantages associated with instructional technology were expressed as amount of time required for presentation, hardware and software failures or difficulties, and lack of adequate technical support.

Recommendations and implications of this research included the utility of the Concerns-based Adoption Model as a diagnostic tool to determine concerns of faculty toward instructional technology. The use of the Stages of Concern Questionnaire coupled with demographic and open-ended questions provided a diagnostic tool useful in the preparation and presentation of specific faculty training and technical support. Recommendations for further research included the development of a Stages of Concern Questionnaire related specifically to the innovation of

instructional technology, longitudinal studies of the concerns of college faculty toward instructional technology and the utilization of the Stages of Concern process to determine student concerns toward the use of instructional technology.

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CHAPTER ONE

Introduction

Background of the Problem

There is little doubt that technology is a principal force gradually transforming the work and careers of professors. Because this transformation is still underway, the eventual outcome remains in doubt. It is too soon to say what academic life will be like in 2010 or 2025 as a result of technology's impact. It is not too soon, however, to see that technology has special challenges to faculty which must be addressed if the academic profession is to remain healthy and vital.

Baldwin, 1998, p.12

The use of computers and digital networked information in higher education is increasing at a rapid rate. Instructional technology has become a force for innovation and reform efforts designed to improve and enliven the intellectual discourse in American universities (Altbach, Berdahl, & Gumpert, 1999).

Hailed as a development of the same revolutionary impact as the Gutenberg press by some and feared and demonized by others, computers as an integral part of the educational process cannot be ignored. The speed of

current technological progress proceeds at a daunting rate. Just as one system or software package becomes comfortable, it is declared obsolete. The computer, the software, and network will still do what it was designed to do, but it is no longer exactly what is needed (Frances, Pumerantz, & Caplan, 1999).

Statement of the Problem

This quantitative study explored the concerns that liberal arts faculty members have toward the use of instructional technology as an innovation. While computers and networks have now been available for several years, they have not been completely integrated into the educational process. Computers, network connections, and software packages do not stay the same but change dramatically in a very short time span. Even professors who are proactive and excited by the promise of instructional technology can have a difficult time keeping up with the myriad of change.

At the same time, there is increasing pressure on universities to incorporate technology into teaching. Virtual universities have become a reality and no one yet knows what effect such entities will have on more traditional educational institutions (Dolence & Norris, 1995).

Purpose of the Study

The purpose of this study was to explore the concerns liberal arts faculty exhibit toward the use of instructional technology as an innovation. The Concerns-based Adoption Model (CBAM) theoretical framework and the Stages of Concern Questionnaire (SoCQ) were chosen as the methodological framework to gather data. The SoCQ has been utilized in previous research studies on the process of change and the implementation of various innovations. The SoCQ was designed to determine attitudes and concerns of teachers toward an innovation. The instrument was designed to gather information about any educational innovation. Thus, it is adaptable to using instructional technology as the innovation under study.

Research Questions

The following research questions were addressed:

- (1) At what stage of concern were faculty individually and as a whole in relation to the innovation of instructional technology?
- (2) Are levels of concern related to demographic factors of academic rank, tenure status, or age? Is there a statistical difference in the stage of concern related to demographic factors?

(3) Are self-reported levels of use, frequency of use and access to training significant predictors of stage of concern?

(4) What advantages and disadvantages do faculty report? Are the expressed advantages and disadvantages of the use of instructional technology related to the stage of concern?

Need for the Study

Instructional technology is an issue of concern for faculty in universities and colleges across the country in the year 2000 and will remain so for the foreseeable future (Gillespie, 1998; Green, 1999). The current educational literature supports the need for a study dealing with faculty concerns toward educational technology. Kay Herr Gillespie (Gillespie, 1998) published *The Impact of Technology on Faculty Development and Work* in 1998 dealing with the impact of technology upon the lives and work of college faculty members. All aspects of academic life have been altered by the availability of computers and high speed networks.

Green's *Campus Computing Report* (Green, 1999) has documented a yearly increase in the number of computers and network connections on campuses as well as increasing use by professors of instructional technology to enhance classroom teaching. Information about concerns in relation to

instructional technology can be useful in designing meaningful support and assistance for faculty uses of instructional technology.

Methodology

The use of the Stages of Concern Questionnaire (SoCQ) as a data collection instrument based upon the Concerns-based Adoption Model provided a fast and efficient method to gather information from faculty. Faculty members are notoriously busy people with little time to spare. The relative ease of response to the survey allowed for little intrusion upon faculty time while the open-ended questions on the advantages and disadvantages provided a forum for them to express specific thoughts and feelings. The survey was composed of 35 questions answered by a Likert-like scale from 0–7 and a brief demographic section. There were two open-ended questions related to the advantages and disadvantages of using technology in instruction. No limit was placed upon the length or brevity of the answers.

Limitations and Assumptions

The data collected for this study presented a one-time, brief view of the concerns that faculty at one liberal arts college had toward the use of instructional technology as captured on the SoCQ survey. The SoCQ was validated by the Research and Development Center at the University of Texas

in Austin in the 1970's. While the instrument has been validated, the authors of the survey caution that the validity of individual data rests on the assumption of good will and accurate reporting from the respondents.

The survey provided data related only to concerns as expressed in this particular instrument. Judgement or evaluation of the efficacy of instructional technology in higher education cannot be extrapolated from this data.

Definition of Terms

The following definitions have been used for the purpose of conducting this study:

Concern

The mental construct represented by thoughts, feelings, and considerations directed toward a specific task or issue as developed by Hall et al. (Hall & George, 1979)

Instructional Technology

The use of computers and / or the Internet in instruction. This definition does not include the use of any older instructional technologies such as slide projectors, analog video, etc.

Internet

The network of networks linking users in a world-wide

information network and including applications such as the World Wide Web and electronic mail.

Stages of Concern:

Seven developmental phases of the Concerns-based Adoption Model an individual typically moves through when confronted with an innovation.

Peak Stage of Concern:

The stage of the Concerns-based Adoption Model, which has the highest, score (0-35) on the Stages of Concern Questionnaire and is therefore the most intense concern of the individual.

CHAPTER TWO

Review of the Literature

Introduction

The literature review for this study of the concerns of liberal arts faculty toward the use of instructional technology begins with a brief overview of the development of liberal arts education in the United States. It is instructive to view the current topic against the historical backdrop of previous concerns and pedagogical issues. Secondly, the use of instructional technology in higher education is examined with particular emphasis on computer and network applications in teaching.

Next, research on the diffusion of innovation and the change process is examined for insights into how human beings adapt to change. Discussion of the Concerns-based Adoption Model and an overview of educational research utilizing the methodology are included to gain perspective on the research technique.

Development of American Liberal Arts Colleges

The first college in the American colonies was founded at Newtown (later renamed Cambridge), Massachusetts in 1638. Established by the

Puritans, the early curriculum at Harvard College was designed to educate clergy and civic leaders *pro modo Academicarum in Anglia* ("according to the manner of universities in England")(Lucas, 1994).

Students at Harvard and the eight other colleges founded prior to the American Revolution studied a course "of medieval learning, devotional studies...and late Renaissance arts and literature (Lucas, 1994). Proficiency in Greek and Latin was required for admission to the all-male institutions of learning. The four year curriculum included studies in Greek, Hebrew, logic, rhetoric, ethics, Aristotelian metaphysics, mathematics, and philological studies in classical languages. This curriculum was generally regarded as a "fixed body of absolute, immutable truths" (Lucas, 1994; Cohen, 1998).

In the early years of colonial colleges, Latin was the language spoken during instruction. There were few textbooks; libraries were small and consisted mostly of reprints of classical texts. Instructional methods usually consisted of lectures by tutors or professors and student recitations supplemented by readings from the meager supply of books. Only gradually did pedagogical practices shift from "medieval scholasticism" to empirical experimentation and inquiry (Cohen, 1998).

The development of colonial colleges in the pre-Revolutionary period established the tradition of a standard curriculum devoted to liberal learning. This tradition became the foundation of an academic archetype emulated by

the many liberal arts colleges founded in the nineteenth century and continuing into the present day (Lucas, 1994).

In the early years of American higher education, the concept of public or private colleges was ambiguous. Many of the early colleges were founded and funded by legislative charters but controlled by religious entities (Lucas, 1994). While retaining internal control, these colleges sought state grants to augment limited budgets. In 1819, a Supreme Court decision known as the Dartmouth Case established the foundation for the modern distinction between public and private colleges. In essence the Supreme Court ruled that state control of an institution was not permissible unless the institution was created expressly as a public entity and supported by public funds. Many historians believe the ruling in the Dartmouth Case encouraged the development of private liberal arts colleges by protecting the autonomy of the private college and clearly delineating the distinction between public and private (Lucas, 1994). The legal distinction of private autonomy and freedom from outside interference fueled an increase in the number of private liberal arts colleges in the nineteenth century (Cohen, 1998).

During the course of the nineteenth century, many liberal arts colleges were founded by various religious denominations. At the beginning of the Revolutionary War there were nine colleges in America; by the end of the Civil War there were over 250 colleges. Many of the private liberal arts colleges floundered soon after opening but many also survived and are still in

the business of providing liberal arts education to students in the twenty-first century (Lucas, 1994).

Arguments over curriculum and what constituted a general education surfaced early in the history of American colleges. At the center of the controversy was the perennial problem of utilitarian and vocational instruction versus classical education. In a culture increasingly shaped by scientific advancements and technology, the study of classical learning and languages seemed "not adapted to the spirits and wants of the age" (Lucas, 1994).

The Yale Report, issued in 1827, was a widely read and influential defense of the traditional classical education. The report, written by the president of Yale College and a selected committee of scholars, argued for the development of the intellect and rigorous training of the mind through study of subjects such as mathematics, ancient and modern English literature, logic, rhetoric, oratory, written composition, and physical science. Rather than a preparation for a profession, an undergraduate education should lay a foundation "common to all" (Lucas, 1994).

Francis Wayland of Brown University held an opposing point of view. In 1850, his perception of the flaws in American higher education prompted this assessment:

"We have produced an article for which the demand is diminishing.

We sell it at less than cost and the deficiency is made up by charity....

Is it not time to inquire whether we cannot furnish an article for which the demand will be, at least, somewhat more remunerative?" (Lucas, 1994)

The argument over whether liberal education should seek to impart rigor of mind based on classical knowledge and traditional skills or be more attuned to vocational needs of students and the larger world is an argument as yet without resolution.

James O'Donnell, a Classical Studies professor and also interestingly, Vice Provost for Information and Computing at the University of Pennsylvania, raised questions for modern academics that are reminiscent of Wayland's questioning the purpose of the colleges of the 1850's. In *Avatars of the Word: From Papyrus to Cyberspace*, O'Donnell devotes a chapter to the "New Liberal Arts" and the impact of networked, digital information:

The changes this technology will bring raise a host of questions for academics: What will we do on the superhighway? What happens to higher education when every student has a link to a flood of words and images, metastasizing in every imaginable way from around the world, and when every teacher and every student can reach out to each other at all hours of the day and night? The short answer is that we don't know; we will soon, and are even now finding out; and in so doing we will reinvent pedagogy and the university as we know it now. (O'Donnell, 1998)

For both Brown in 1850 and O'Donnell in 1999, changes in science and technology in the world beyond the university demand new approaches to teaching and learning.

Echoes of the 1827 Yale Report are still heard as well in the works of scholars such as JD Hirsch, Alan Bloom, and William Bennett (Lucas, 1994; Cohen, 1998). The idea of a general liberal arts curriculum and a common core of knowledge taught in a traditional setting had roots in the very beginnings of the American system of liberal arts education.

Instructional Technology in Higher Education

Marshall McLuhan coined the terms "Information Age" and "global village" in the 1960's before the advent of powerful desktop computers connected to a global network of networks known as the Internet (McLuhan, 1964, 1996). Those terms and the conceptualization of the world as an interconnected global village driven by ever-increasing amounts of information, describe very precisely the world and society of the present day.

The development of the microcomputer was an invention that has profoundly impacted almost every element of modern society. If technological innovations are extensions of our senses and physical being (McLuhan, 1964, 1996), then the computer is no less than a tool extending the mind (Negroponte, 1995; Turkle, 1984).

Given that the digital computer and the Internet are widely available, to what extent have these innovations impacted the world of higher education? An approach to answer this question is to define instructional technology and then review how it has been incorporated into colleges and universities across the United States.

The idea of educational or instructional technology did not begin with the computer. Older technologies available to professors included overhead projectors, slide projectors, charts, maps, film and video and many other tools used in teaching. In fact, textbooks were made possible by the invention of the printing press, a revolutionary technology of the 15th century (Withrow, 1997).

After the desktop computer became widely available, the terms instructional and educational technology usually mean the use of computers and networked information in the teaching and learning process. The Association of Educational Communications and Technology (AECT) developed a definition for instructional technology in 1977:

Instructional technology is a complex, integrated process involving people, procedures, ideas, devices, and organization, for analyzing problems, and devising, implementing, evaluating and managing solutions to those problems, in situations in which learning is purposive and controlled (Ely & Plomp, 1996).

In 1972, Engler studied the meanings attributed to the term instructional technology and concluded that it is commonly defined in two ways:

First and most commonly, it is defined as hardware; essentially these are the implements and media of communication. Second, and more significantly, it is defined as a process by means of which we apply the research findings of the behavioral sciences to the problems of instruction. Defined either way, instructional technology is value free. Gutenberg technology, as an example, can produce the *Bible*, *Mein Kampf*, and *Pornoy's Complaint*, with equal indifference. (Anglin, 1995)

Instructional technology provides a construct for the development of pedagogy involving the use of human tools to aid and enhance the experience of learning. The computer and the digital communications network of the Internet are merely the latest set of tools available to educators and students. It is doubtful that computers and the Internet will be the last word in instructional technology as the pace of the development of new computer technologies accelerates. (Altbach, 1999).

It is difficult to estimate the impact of computing upon higher education. The *Campus Computing Project* (Green, 1999) reveals an increased use of technology by college professors in 1999. Of all college courses, 54 percent used electronic mail for student and faculty communication, an increase from 44 percent in 1998 and 20.1 percent in 1995. The percentage of

college courses utilizing Web resources was 38.9 percent in 1999 compared to 33.1 percent in 1998 and 10.9 percent in 1995. Courses with a web page increased to 28.1% compared to only 9.2 percent in 1996. The 1999 survey also revealed that 19 percent of college faculty maintained a personal web page.

David Brown of Wake Forest University has identified instructional technology uses in college classrooms across the country. The most popular techniques reported include computerized self-paced learning exercises, PowerPoint presentations by professors and students, multimedia visualizations, comparative analysis, student web searches, online lecture notes, simulation exercises, team projects, and electronic course management (Brown, 2000). (See Figure 1 for a *Typology of Educational Beliefs Motivating the Adoption of Educational Technology* developed by Brown).

The college faculty integrating technology into instruction in Brown's *Vignettes* provide validity for the definition of instructional technology as a means to systematically improve teaching in a complex and integrative manner. The typology of motivations for adoption of technology illustrates a concern for teaching and learning as an active process of engagement for the student. The *Vignettes* range across all academic disciplines and all institutional types, including liberal arts colleges.

Not all professors, however, are excited proponents of instructional technology. For some, it is "...threatening to teaching traditions that have evolved over centuries" (Frances, 1999). For others, the specter of the

**Typology of Educational Beliefs Motivating the
Adoption of Computers in Teaching**

- 1. Interactive Learning**
 - A. Collaborative Learning
 - B. Learning by Doing
 - C. Role-Playing
 - D. Integrating Theory and Practice
- 2. Communication**
 - A. Frequent Feedback
 - B. Prompt Feedback
- 3. Customization**
 - A. Different Strokes for Different Folks
 - B. Repetition
 - C. Time on Task
- 4. New Materials and Modes of Presentation**
 - A. Visualization
 - B. Comparative Analysis
 - C. Motivating Material
 - D. Spectrum of Materials
 - E. Equal Access to Materials
- 5. Student Responsibility and Initiative**

Figure 1. Typology of Educational Beliefs

Source: Brown, David G. (2000) *Interactive Learning: Vignettes from America's Most Wired Campuses*, Bolton, MA: Anker Publishing Company, Inc.

automation of higher education by the proliferation of computerized courses would mean the end of all teaching and learning and the downfall of civilization as we know it (Noble, 1998).

Many faculty, however, are neither excited early-adopting innovators nor change-resistant laggards. Ehrmann succinctly identified the primary problem for the successful integration of instructional technology:

Too many observers assume that if they know what the 'hardware' is (computers, seminar rooms) they know whether student learning will occur. They assume that if faculty get this hardware, they will easily, automatically, and quickly change their teaching tactics and course materials to take advantage of it. Thus, technology budgets usually include almost no money for helping faculty and staff.

(Ehrmann, 1995)

Innovation and instructional technology are not unique to the present time. Both have been in evidence in the world of higher education for several years. In fact, the issue of "faculty response to proposed innovations in college and university programs constitutes one of the perennial issues in higher education (Margolis, 1998).

Change and innovation as well as instructional technology are usually studied and written about from the perspective of the "change advocates rather than the point of view of the faculty who are expected to implement change" (Dolence & Norris, 1995; Frances et al., 1999).

Resistance to innovation from the perspective of the change advocate is often viewed as non-progressive without an investigation of the underlying factors that might make the implementation of an innovation problematic. For instance, Erhmann (1995) analyzed educational software developed by faculty in the 1980's and early 1990's and found an inherent problem in the development and diffusion of software. According to his research, it typically took years for curricular software to be developed and then widely accepted. The more complicated and "revolutionary" the software, the longer the development processes. By the time the software was ready for use, computer operating systems and interfaces had changed to the point that the software appeared obsolete rather than innovative.

Change Research

The concept of innovation adoption is crucial for an understanding of faculty response to instructional technology. Everett Rogers wrote the classic work on change theory. The *Diffusion of Innovation* synthesized the work of more than 500 researchers in the field of innovation adoption. The book was first published in 1962 and is now in its fourth edition and is considered a seminal work in the field of change research (Surry, 1997).

According to Rogers, the adoption of an innovation is a "mental process through which an individual passes from first hearing about an

innovation to final adoption" (Rogers, 1995). The process consists of five discrete stages: awareness, interest, evaluation, trial, and adoption.

Individuals adopt innovations at different rates. The innovators or pioneers lead the way followed by the early adopters, the early majority, the late majority, and the laggards.

The Rate of Adoption theory postulates that innovations are diffused over time in a pattern resembling a s-shaped curve. The adoption of an innovation is characterized by a period of slow growth, a period of rapid growth, a period of stabilized growth, and eventually a marked decline in growth of the innovation or a state in which the innovation is no longer an innovation but an accepted practice.

In Rogers Theory of Perceived Attributes, innovation adopters judge an innovation based on personal perceptions of its attributes. The attributes of an innovation are defined as trialability, observability, relative advantage, complexity, and compatibility (Rogers, 1995).

In addition, the Individual Innovativeness theory hypothesizes that some individuals are predisposed to being innovative and will adopt an innovation earlier than those who are not predisposed. It is unclear, however, what factors contribute to an individual being predisposed to innovativeness.

Concerns-based Adoption Model

Dr. Gene Hall and his associates at the Research and Development Center of the University of Texas in Austin developed the Concerns-based Adoption Model (CBAM) in the 1970's. Hall's theory of concerns built upon the work of psychologist Frances Fuller who studied the concerns of pre-service and in-service teachers and found that they progressed through typical phases relative to the amount of time spent in the teaching profession (Fuller, 1969). Fuller's work centered upon psychological development of the stages or phases of concern.

The Concerns-based Adoption Model combined Fuller's theory of phases or stages of progression through concerns with Roger's concept of change and adaptation to an innovation (Hall & George, 1979).

Six assumptions guide the conceptualization of the Concerns-based Adoption Model:

- 1. Change is personal and understanding the point of view of participants in any change process is critical to the implementation of any innovation.**
- 2. Change is a process, not an event.**
- 3. It is possible to anticipate much that will happen during a change process.**
- 4. Innovations take many forms and are not necessarily dramatic in scope.**

5. Innovation and implementation are "two sides of the same coin."

6. In order for "something" to change, "someone" has to change.

In other words, change is an individually human process related to individual thoughts, feelings, and experiences (Hall & Hord, 1987).

The Concerns-based Adoption Model was developed by Dr. Gene Hall and the staff at the Research and Development Center at the University of Texas in Austin. They observed that teachers and professors faced with an innovation seemed to follow a pattern of phases of concern similar to Fuller's phases of teacher development (Hall, George, & Rutherford, 1979).

In 1973, Hall, Wallace, and Dossett proposed that the use of a validated survey instrument could be used to pinpoint the phase or stage of concern of individual members of an organization relative to the adoption of an innovation. Seven stages of concern were identified for use in the Concerns-based Adoption Model:

0__Awareness: Little concern about or involvement with the innovation is indicated.

1__Informational: A general awareness of the innovation and interest in learning more detail about it is indicated. The person seems to be unworried about himself/ herself in relation to the innovation. She/ he is interested in substantive aspects of the innovation in a selfless manner such as general characteristics, effects, and requirements for use.

2__Personal: Individual is uncertain about the demands of the innovation, her/his inadequacy to meet those demands, and her/his role in relation to the reward structure of the organization, decision making and consideration of potential conflicts with existing structures or personal commitment. Financial or status implications of the program for self and colleague may also be reflected.

3__Management: Attention is focused on the processes and tasks of using the innovation and the best use of information and resources. Issues related to efficiency, organizing, managing, scheduling, and time demands are of the utmost importance.

4__Consequence: Attention focuses on the impact of the innovation in her/his immediate sphere of influence. The focus is on relevance of the innovation for students, evaluation of student outcomes, including performance and competencies, and changes needed to increase student outcomes.

5__Collaboration: The focus is on coordination and cooperation with others regarding use of the innovation.

6__Refocusing: The focus is on exploration of more universal benefits from the innovation, including the possibility of major changes or replacement with a more powerful alternative. The individual has definite ideas about alternatives to the proposed or existing form of the innovation (Hall et al., 1979).

Previous Research and the Concerns-based Adoption Model

A search of *Dissertation Abstracts* using the Concerns-based Adoption Model as descriptor yielded 101 dissertations using the model and instrumentation of CBAM completed since 1980. The CBAM model has been utilized in research on a wide range of innovations in education and in other fields. Of particular interest to this study was the work of Edwards on the concerns of faculty members at a North Carolina state university about using computers in general (Edwards, 1997) and Toms 1997 study of University of Florida faculty concerns related to use of the Internet (Toms, 1997). Both studies were conducted at large universities and completed in 1997. Findings included validation of the Stages of Concern Questionnaire and the CBAM methodology as a way to describe faculty concerns related to technology. Toms found a moderate correlation (.54) between gender and use of the Internet.

The Concerns-based Adoption Model has also been utilized in the literature dealing with change, technology, and education. Hord and others (Hord, Rutherford, Huling-Austin, & Hall, 1987) (Horsley & Loucks, 1998) have written about using the change process to realize school improvement. McKinnon and Nolan (McKinnon & Nolan, 1989) utilized the concerns-based approach in their work with professional development for teachers on how to use computers. Surry (1997) utilized both the Concerns-based Adoption

Model approach and Rogers diffusion of innovation theories in work with instructional technology.

Dooley (1999) also combined the work of Rogers and Hall in order to develop a holistic view of the diffusion process as related to the benefits of technology in education.

The literature available on the Concerns-based Adoption Model as it related to inquiry regarding the implementation of technology in education, seems to indicate that the CBAM model and the Stages of Concern survey instrument is particularly adaptable to research on instructional technology (Horsley & Loucks, 1998). This may be due to the fact that instructional technology is not a static innovation that has a definite introduction, adoption, and implementation. Instructional technology is in a constant state of flux as new and faster computers are built and more complex and sophisticated software is created.

In Hall's most recent research (Hall et al., 1999), he has worked with a Department of Defense school to incorporate the CBAM model into the implementation phase of innovation. Educators tend to make a "giant leap" assuming that because a technology or innovation is available, it immediately produces an effect. At the DOD school, an implementation phase utilizing the CBAM model provided for an extended period of intensive staff development before any attempt at assessing the success of the innovation.

Summary

This chapter attempted to develop an overarching view of the development of liberal arts colleges in the United States as well as look at the literature related to instructional technology and its use in institutions of higher education.

The work of Rogers on the diffusion of innovation and the separate parts of the theory governing diffusion was presented. The work of Hall et al. on the Concerns-based Adoption Model was discussed in particular as it related to issues of relevance to the topic of instructional technology.

CHAPTER THREE

Procedures and Methodology

Introduction

This chapter restates the research questions, describes the research population and provides demographic frequency counts and percentages for the research sample. The methodology of the Stages of Concern Questionnaire is presented along with procedures related to the data gathering process.

Research Questions

Four research questions were addressed in this study and guided the data gathering process and the subsequent analysis of the data. The questions were:

- (1) At what stage of concern were faculty individually and as a whole in relation to the innovation of instructional technology?**
- (2) Are levels of concern related to demographic factors of academic rank, tenure status, or age? Is there a statistical difference in the stage of concern related to demographic factors?**

- (3) Are self-reported levels of use, frequency of use and access to training significant predictors of the peak stage of concern?
- (4) What advantages and disadvantages do faculty report in an open-ended response? Are the qualitatively expressed advantages and disadvantages of the use of instructional technology related to the quantitative stage of concern?

Research Population

The University of the South is a small, private, nationally ranked, liberal arts university located on the Cumberland Plateau of southern Tennessee in the small town of Sewanee with a population of 2500. The University of the South is commonly referred to as Sewanee both locally and nationally. In many ways the town of Sewanee and the University are indistinguishable in a very unique way. The Vice-Chancellor and President of the University is also the mayor of the town and the University manages and maintains the local government including all municipal services.

The University of the South in fact owns all land in the town of Sewanee, granting leaseholds for businesses and homes. The Domain of the University of the South encompasses 10,000 acres atop a mountain; the land was originally donated to the Episcopal Church in 1856 for the purpose of building a university. Ownership of Sewanee is retained by the Southern

Diocese of the Episcopal Church and the titular head of the University of the South is the Chancellor elected from the Bishops of the owning diocese.

Sewanee cultivates a reputation as an academically rigorous institution of higher learning and places emphasis on traditional liberal arts values and scholarship. In the 1999-2000 academic year, there are 1329 students with 108 full-time faculty. More than 97% of the full-time tenure-track faculty have obtained terminal degrees. Emulating the tradition of Oxford and *pro modo Academiarum in Anglia*, [Lucas, 1994 #13] faculty members teach wearing black academic gowns. Students who have attained high academic honors are awarded the privilege of wearing an academic gown to class as well. The University of the South is now a coeducational institution although from its founding until 1969, the school was for males only.

In addition to the undergraduate liberal arts college, the University of the South also has a School of Theology awarding graduate degrees in theology and ministry. The student population at the School of Theology is small (80 students) and much older than the traditional undergraduate student body. Most theological students are seeking to enter the ministry as a second career and typically are adult learners with families. (The School of Theology is seeking a \$300,000.00 grant from the Eli Lilly Foundation to support the use of technology in theological education).

In this traditional environment, the use of technology by faculty and students increasingly is an issue of concern, mirroring the national obsession

with the infusion of technology into the educational process. In 1996, the Center for Teaching was created to provide pedagogical support and assistance to faculty members. Many projects attempted to incorporate instructional uses of technology, resulting in the creation of the Instructional Technology Workshop as a part of the Center for Teaching in 1998. The ITW was funded by a \$300,000.00 grant from the Mellon Foundation with the express purpose of facilitating faculty use of instructional technology. As part of the grant proposal, the University of the South committed to assuming costs associated with the ITW at the end of the 2001 academic year. Funds from the Mellon grant provide stipends for faculty members to work on projects utilizing instructional technology during the January term between academic semesters and during summer vacation. In addition student interns are paid to assist faculty in the technical development of projects. Faculty travel to visit exemplary instructional technology projects at other institutions of higher education is also supported.

Grants are available to University of the South faculty from the Associated Colleges of the South (ACS) and the Appalachian Colleges Association (ACA) for the development and implementation of instructional technology projects. Both of these organizations have funding from the Mellon Foundation aimed at supporting the use of technology in a liberal arts environment.

While there appears to be significant interest in the use of instructional technology, actual implementation is often problematic. This study attempts to clarify faculty attitudes that might impact the use or nonuse of instructional technology in a tradition-imbued liberal arts environment.

Study Design and Procedures

Communication

All faculty members at the University of the South are required to communicate through the use of the campus electronic mail system. Each faculty member has an office computer connected to the campus network (AngelNet) with Eudora Lite electronic mail software installed and configured. HelpDesk services are supplied by the Information Technology Services infrastructure in order to maintain the connection at a reliable level. This system had been in place since 1995 (Alvarez, 1996) and faculty are familiar with and use it. New faculty members are required to attend an orientation session on the use of Eudora Lite and electronic mail communication and are also provided general information about the campus network. Most administrative and general communication is accomplished using a college faculty listserv, which distributes electronic messages to all faculty members.

An electronic mail message was sent on February 2, 2000 to the faculty listserv soliciting participation in this study. (Message attached in Appendix

1.) Three options were offered to the faculty for completing the survey:

(1) A faculty member could connect to a World Wide Web site at

<http://forum1.sewanee.edu/CBAMWEB/> and complete the survey online;

(2) A Microsoft Word file was attached to the email message and could be downloaded, completed, and returned to the researcher using an electronic mail reply;

(3) The Microsoft Word file could be downloaded, completed, printed, and returned to the researcher using the Student Post Office (SPO), the campus mail system.

A follow-up message was sent to the faculty listserv on February 9, 2000 with a reminder and deadline for returning the survey (Appendix 2). In addition to the electronic mail messages, a faculty member, Pradip Malde of the Art Department, voluntarily issued a verbal request for completion of the survey at the February faculty meeting.

The survey file was attached in Microsoft Word format because Microsoft Office software is the standard software installed on campus computers including those in faculty offices. Faculty are familiar with downloading attached Word files in Eudora and it is a common practice at the University of the South. The option of printing and returning a hard copy

or returning via electronic mail was offered to allow a comfortable range of choices for dealing with the survey. In addition, the printed hard copy offered a completely anonymous alternative for return. Although it was expressly stated that no identifying data would be available to anyone other than the researcher, the option of anonymous response was deemed important and in fact, two completely anonymous surveys were returned.

Survey Database

The survey World Wide Web site was developed by the researcher using FileMaker Pro (version 4.1) database software and Claris HomePage (version 3) HyperText Markup Language (HTML) editing software. First, a database was constructed containing fields for each demographic and open-ended question (including pop-up menus for demographic questions with a fixed range of choices) and a field for each of the 35 Stages of Concern Questionnaire items with radio buttons for selection of answer choice in the range of 0 through 7. Utilizing the Claris Dynamic Markup Language (CDML) protocol and Claris HomePage wizard to dynamically link a database to a web page, the researcher built a web site where participants could answer and submit results directly into the FileMaker Pro database. Participants could not view or edit the records of other participants and could

not retrieve or edit their own answers once the survey was submitted. (See Appendix 3 for printed screens of the online survey).

The WWW site and the Microsoft Word file questionnaire presented identical definitions and instructions for responding to the survey.

Instrumentation

The instrument used to collect data on faculty concerns was the 35-item Survey of Concerns Questionnaire (SoCQ) developed by Dr. Gene Hall and associates at the Research and Development Center for Teacher Education at the University of Texas in Austin (Hall et al., 1979). Permission to use the survey instrument was obtained from the Southeast Educational Development Laboratory in December of 1999. (Appendix 4)

Development of the SoCQ was based on research performed by Frances Fuller in the area she termed "teacher concerns" (Fuller, 1969). During the 1960's, Fuller proposed a developmental conceptualization of the concerns of teachers suggesting that concerns occurred in a developmental sequence for all teachers irrespective of a particular educational program (Hall et al., 1979). Eventually, Fuller abstracted the model into self, task, and impact concerns. Building upon Fuller's premise, Dr. Gene Hall and associates observed that teachers and professors involved in change appeared to express a similar sequence of concerns related to an innovation and began

developmental work on the Concerns-based Adoption Model (CBAM) (Hall, 1974).

The SoCQ was validated at the University of Texas at Austin over a three-year period. The first pilot instrument in 1973 consisted of open-ended concerns statements and forced ranking. Utilizing the pilot studies, 544 potential items were generated and sorted with the result that 400 items were determined to be related to a particular Stage of Concern. After the items were edited for redundancy, 195 items were selected for inclusion on a pilot instrument given in 1974 to a sample of teachers and college faculty stratified according to years of experience with an innovation and including both users and nonusers (Hall et al., 1979).

The 35-item questionnaire was then compiled from the 195-item instrument by selecting items corresponding to each factor. This shortened questionnaire was then administered to 171 higher education and elementary faculty members.

Reliability of the instrument was further tested over the next two years by administering the survey to different groups. The alpha coefficients of internal reliability for the SoCQ were computed to be reliable in a range of .64 to .83. Test-retest correlations were computed using the Pearson-r with a range of .65-.86 (Hall et al., 1979). The validity of the 35-item survey was calculated using correlation matrices and factor analysis. Longitudinal studies

in a variety of settings were also used in the development of the final SoCQ instrument to establish both reliability and validity (Hall et al., 1979).

The Stages of Concern Questionnaire

The copyrighted SoCQ used in this study contained 35 items designed to collect information about the attitudes and concerns of teachers or professors toward an innovation. The innovation was purposefully very loosely defined according to Hall's recommendation (Hall et al., 1979).

The definition presented to University of the South faculty for completing the SoCQ defined instructional technology as the use of any computer technology, including the Internet, in the process of instruction. The definition precluded older technologies (i.e. slide projectors, analog video, and sound recordings, etc.) as not being in the area of interest for this research study. Specific definitions or examples of computer and Internet uses in instruction were not provided.

Respondents provided basic demographic data related to department, teaching rank, age, years teaching, tenure status, self-ranking as to level of instructional technology use, participation in training, and frequency of instructional technology use. The demographic section also provided for an open-ended response describing perceived advantages and disadvantages of the use of instructional technology.

Responses to the 35 item SoC questions were chosen from eight alternatives on a Likert-like scale from 0 to 7 with 0 meaning irrelevant to me at this time, 1 meaning not true of me now, 4 the mid-point of somewhat true of me now and 5 through 7 reflecting gradations of very true of me now.

Items on the SoCQ were grouped into seven stages of concern with 5 items corresponding to each of the seven stages: Stage 0, Awareness; Stage 1, Informational; Stage 2, Personal; Stage 3, Management; Stage 4, Consequence; Stage 5, Collaboration; and Stage 6, Refocusing. The questions were not in order by stage but were mixed in the survey. Questions were used in the exact order as provided in the instructional manual for using the survey. The only modification was the term "innovation" in the generic SoCQ was replaced by the term "instructional technology" in the survey distributed to University of the South faculty.

The stages and corresponding questions on the survey used in this study were as follows:

Stage 0: Awareness

- (3) I don't even know what instructional technology is.
- (12) I am not concerned about instructional technology.
- (21) I am completely occupied with other things.
- (23) Although I don't know about instructional technology, I am concerned about things in this area.

(30) At this time, I am not interested in learning about instructional technology.

Stage 1: Informational

(6) I have a very limited knowledge about instructional technology.

(14) I would like to discuss the possibility of using instructional technology.

(15) I would like to know what resources are available if we decide to adopt instructional technology.

(26) I would like to know what the use of instructional technology will require in the immediate future.

(35) I would like to know how instructional technology is better than what we have now.

Stage 2: Personal

(7) I would like to know the effect of instructional technology on my professional status.

(13) I would like to know who will make the decisions.

(17) I would like to know how my teaching or administration is supposed to change.

(28) I would like to have more information on time and energy commitments required by instructional technology.

(33) I would like to know how my role will change when I am using instructional technology.

Stage 3: Management

(4) I am concerned about not having enough time to organize myself each day.

(8) I am concerned about conflict between my interests and my responsibilities.

(16) I am concerned about my inability to manage all that instructional technology requires.

(25) I am concerned about time spent working with non-academic problems related to instructional technology.

(34) Coordination of tasks and people is taking too much of my time.

Stage 4: Consequence

(1) I am concerned about students' attitudes toward instructional technology.

(11) I am concerned about how instructional technology affects students.

(19) I am concerned about evaluating my impact on students.

(24) I would like to excite my students about their part in this approach.

(32) I would like to use feedback from students to change instructional technology.

Stage 5: Collaboration

- (5) I would like to help other faculty in their use of instructional technology.**
- (10) I would like to develop working relationships with both our faculty and outside faculty who are using instructional technology.**
- (18) I would like to familiarize other departments or persons with the progress of this new approach.**
- (27) I would like to coordinate my effort with others to maximize the effects of instructional technology.**
- (29) I would like to know what other faculty are doing in this area.**

Stage 6: Refocusing

- (2) I now know of other approaches that might work better.**
- (9) I am concerned about revising my use of instructional technology.**
- (20) I would like to revise the instructional approach of using technology.**
- (22) I would like to modify our use of instructional technology based on the experiences of our students.**
- (31) I would like to determine how to supplement, enhance, or replace the use of instructional technology.**

Data Collection

During the period of data collection, survey responses were received either as electronic mail messages, traditional paper messages, or were recorded directly into the FileMaker Pro database available over the WWW.

Of the 108 full-time faculty surveyed, 73 responded for a response rate of 68%. Of the 73 responses, 2 were incomplete due to transmission difficulties with electronic mail and were not used in the final results, leaving a total of 71 responses or 66% of the 108 full-time faculty members.

Of the 71 responses, 38 or 54% were received via the WWW site. Eight or 11% were received via the Student Post Office (SPO). The remaining 25 or 35% of the responses were sent directly to the researcher's electronic mail address.

Of note was the high rate of response to the WWW site. The 38 responses translated to 35% (or 54% of faculty returning the survey) of the total full-time faculty using the WWW to respond to the survey. Previous studies utilizing the SoCQ available as a web form had much lower response rates using the WWW than with a more traditional mode of return. (CF Toms with 5% electronic returns(Toms, 1997)). In addition, previous studies utilizing a web response option contained a form submitted to an electronic mail address rather than utilizing a database dynamically linked to a web page.

The web responses tended to come in earlier during the survey period with the majority (30 or 42% of the total) of the web responses received in the first week of data collection. This method of polling faculty members appeared to be least intrusive in terms of faculty time as well as providing data already in a format ready for analysis. However, it is possible that this group of web responders as a whole were more technologically savvy than the other respondents.

The electronic mail responses and the paper responses were entered into a FileMaker Pro database along with the 38 WWW responses already in the format of a FileMaker Pro database. The responses could then be manipulated and exported into an Excel spreadsheet for analysis with the arithmetical and statistical functions of Microsoft Excel software and were then exported to Systat statistical software for further analysis.

Data Analysis

The analysis of the data were accomplished using a variety of techniques. The first step was to break down the demographic responses to obtain a descriptive profile of the faculty sample responding to the survey. Frequency counts and percentages of faculty respondents by academic rank, and age range were calculated and are attached in Table 1.

Scoring of the Survey

The *Manual for Use of the ScC Questionnaire* (Hall et al., 1979) detailed how to score the individual profiles and how to use the profiles to obtain grouped data.

The five items in each of the seven categories were added to obtain a raw score on each of the seven stages. Total scores for all seven sub-categories were added to give an indication of overall intensity of concerns with lower total scores reflecting less intensity and higher scores reflecting more intense levels of concern.

Table 1. Demographic Characteristics of Survey Respondents

	<u>F</u>	<u>%</u>
Rank (N=71)		
Instructor	9	13
Assistant Professor	18	25
Associate Professor	10	14
Professor	34	48
Tenure Status (N=71)		
Tenure	44	62
Non-tenure	27	38
Age Range (N=69)		
20-29	1	1
30-39	15	21
40-49	12	17
50-59	24	34
60-69	6	8
Over 70	1	1

The raw scores were converted to percentiles based upon a chart included with the *Manual for Use of the SoC Questionnaire*. The percentiles were based on the responses of 646 individuals completing the survey in 1975 (Hall et al., 1979). The individuals used for the percentile development were part of a stratified sample of professional educators from elementary teachers to college professors with a range of experience from nonuser to experienced in a particular innovation. The percentiles were used in the validity studies of the SoCQ. The percentile chart is attached as Appendix 5.

Hall et al. recommended using the peak stage of concern when working with grouped data. Peak stages and percentile rankings were identified for respondents. A cross-tabulation with the second highest stage of concern was also completed as recommended by Hall et al. Peak stages and percentiles were broken down by levels of use, academic ranking, tenure, and department. The Chi-square statistical measure was then applied to determine significance in the expected and observed variations of the data. The application of the Chi-square statistical measure went beyond the recommendations contained in the *Manual for Use of the SoC Questionnaire*. The documentation for the SoCQ explicitly stated that demographic factors have not been found to be related to the stage of concern. The application of the Chi-square measurement was a test of this assertion.

Research Question Procedures

Research question 1 was answered by compiling individual profiles of each sample respondent; the profiles were then grouped and averaged to obtain a peak stage of concern, with group mean and standard deviation reported.

Research question 2 concerning significance of stages of concern to demographic differences was answered by the development of the three hypothesis:

Hypothesis 1 (H_1). There will be no statistically significant difference in the peak stage of concern of faculty toward the use of instructional technology related to tenure status.

Hypothesis 2 (H_2). There will be no statistically significant difference in the peak stage of concern of faculty toward the use of instructional technology related to academic rank.

Hypothesis 3 (H_3). There will be no statistically significant difference in the peak stage of concern of faculty toward the use of instructional technology related to age.

To confirm or reject these hypothesis, the Chi-square measurement, a nonparametric test of significance was utilized. The Chi-square test was applied to determine the significance of frequency counts of individuals in the observed group compared to the expected frequency count.

Question 3 concerning the significance of level of use of instructional technology to the peak stage of concern was answered by formulating the following hypothesis:

Hypothesis 4 (H_4). There will be no statistically significant difference in the peak stage of concern of faculty toward the use of instructional technology related to levels of use.

Hypothesis 5 (H_5). There will be no statistically significant difference in the peak stage of concern of faculty toward the use of instructional technology related to frequency of use.

Hypothesis 6 (H_6). There will be no statistically significant difference in the peak stage of concern of faculty toward the use of instructional technology related to participation in training.

To confirm or reject these hypothesis, the Chi-square measurement, a nonparametric test of significance was utilized. The Chi-square test was applied to determine the significance of frequency counts of individuals in the observed group and comparing that to the expected frequency count.

Question 4 concerning the qualitative responses to the open-ended question on the advantages and disadvantages of using instructional technology was answered by sorting and coding the written responses in a systematic manner.

Summary

This chapter presented an overview of the study design, procedures, and methodology. The research population and sample group were described in detail. The methodology for answering the four research questions including the development of null hypothesis and appropriate statistical tests was described.

CHAPTER FOUR

Results and Discussion

Research Questions

The focus of this research study was the exploration of faculty concerns related to the use of instructional technology. A descriptive analysis of the responses to the SoCQ provided quantifiable profiles of individual respondents as well as grouped data to obtain a general profile of the faculty at the University of the South as a whole. In addition, the Chi-square statistical measure was applied to determine if the data were proportional and within the limits of expected findings. Research questions to be addressed included:

- (1) At what stage of concern were faculty, individually and as a whole, in relation to the innovation of instructional technology?
- (2) Are stages of concern related to demographic factors of academic rank, tenure status, or age? Is there a statistical difference in the stage of concern related to demographic factors?
- (3) Are self-reported levels of use, frequency of use, and participation in training significant predictors of stage of concern?

(4) What advantages and disadvantages do faculty report? Are the expressed advantages and disadvantages of the use of instructional technology related to the stage of concern?

Population

The 108 faculty members at the University of the South in Sewanee, Tennessee comprised the population for this study investigating the concerns of liberal arts faculty toward the use of instructional technology. The Concerns-based Adoption Model (CBAM) provided the theoretical construct and the Stages of Concern Questionnaire (SoCQ) was the primary instrument used to gather the data. A response rate of 68% or 73 members of the population responded to the survey. Of the 73 returned surveys, two were blank due to transmission difficulties with electronic mail and the researcher was unable to replace them. There were 71 actual surveys of the 108 full-time faculty, which meant that the data analysis was concerned with a 66% sample of the total population.

Variables

The dependent variable of the study was the peak stage of concern obtained from the Stages of Concern Questionnaire. The raw scores from 0–7 on each of the 35 questions were added and then grouped according to the respective stage of concern. The raw totals for each stage were then converted

to a percentile using a chart developed by Hall et al. (See Appendix 4)

The independent variables were the frequency and level of use of instructional technology, age range, academic rank, and tenure status.

Concerns Theory

In order to interpret the profiles obtained using the SoCQ, it is important to understand the theory of the concerns construct underlying the development of the instrument. Hall and Hord (1987) constructed a model placing the seven stages of concern into categories comprised of unrelated, self, task, and impact concerns. This model was in turn based upon the work of psychologist Frances Fuller (1969). The concerns are divided into four categories: unrelated concerns, self-concerns, management concerns, and impact concerns. Each of the seven stages of concern was placed into one of these four categories.

Unrelated Concerns. Stage 0 or Awareness concerns fall into the unrelated category. Individuals will have "little concern about or involvement with the innovation" (Hall and Hord, 60). Usually associated with non-users of an innovation, Stage 0 concerns can also be high for individuals who are experienced with an innovation and concerned with something other than the innovation (Hall).

Self Concerns. Stage 1, Informational and Stage 2, Personal concerns comprise the category of self-concerns. Informational concerns indicate a general awareness of an innovation and an interest in learning more substantive details about the innovation. Personal concerns indicate uncertainty about the demands of the innovation and the individual's role in relationship to the organizational structure or personal commitments.

Task Concerns. Stage 3, Management is a task concern. In this stage, attention is focused on "...processes and tasks of using an innovation and the best use of information and resources." (H&H) An individual with intense Management concerns is interested in issues related to "...efficiency, organizing, managing, scheduling, and time demands..." (Hall and Hord, 1987).

Impact Concerns. Stages 4, 5, and 6 reflect intense impact concerns. In Stage 4, Consequence, attention is focused upon the impact of the innovation on the student including issues of relevance, evaluation, and changes necessary to increase student performance and outcomes. Stage 5, Collaboration reflects a focus upon coordination and cooperation with other individuals involved with the innovation. In Stage 6, Refocusing, concern is focused upon the discovery of universal benefits related to the innovation and includes the possibility of "...major changes or a more powerful alternative." (Hall and Hord, 1987). Intense Stage 6 concerns can reflect either

an experienced user seeking to expand the innovation or a nonuser who believes there are better alternatives already available.

Profiles

A group profile of the intensity of concerns at each of the different stages can be obtained by scoring and aggregating the individual profiles. It is important to understand what the numbers and percentiles refer to. The scores reflect only the intensity of concerns in reference to a developmental stage in the change process. The scores do not reflect data about the quality of the use of instructional technology or any other innovation. Neither can there be a judgmental decision as to the desirability of having low scores or high scores on any stage. High scores reflect intense concerns and low scores reflect less intensity.

Individual and group profiles can be used to diagnose areas of concern related to innovation implementation, in this case instructional technology. The peak stage of concern is an indicator of the concern with the greatest intensity for the user or group of users. Peak stage and intensity are relative only to the other scores of the individual profile. However, peak scores can be aggregated to obtain a group profile of the most frequent stage of concern although group scores are necessarily not as sensitive to individual concerns.

Typical Profiles

An integral part of concerns theory is the hypothesis that as individuals move from nonuse of an innovation toward levels of proficiency and comfort, the intensity of the various stages of concern will shift. High intensity in Stages 0, 1, and 2 will, over time, become more intense in Stage 3, and eventually in Stages 4, 5, and 6. As this increase in intensity occurs at Stages 3, 4, 5, and 6, the degree of intensity at the lower stages of concern decreases. This hypothesized development is illustrated in the graph in Figure 2. The chart is adapted from the *Manual for Use of the SoC Questionnaire* (Hall et al., 1979).

In terms of this model, a nonuser of an innovation is an individual not involved in using or implementing the innovation. A novice is an individual just beginning to be involved and think about implementation of the innovation. An experienced user has considerable experience in implementation. The renewing user is an individual who has experience with implementation of the innovation and is now moving toward refocusing or thinking about alternatives to the typical implementation of the innovation. The refocusing user may be interested in experimenting with new approaches to the implementation process.

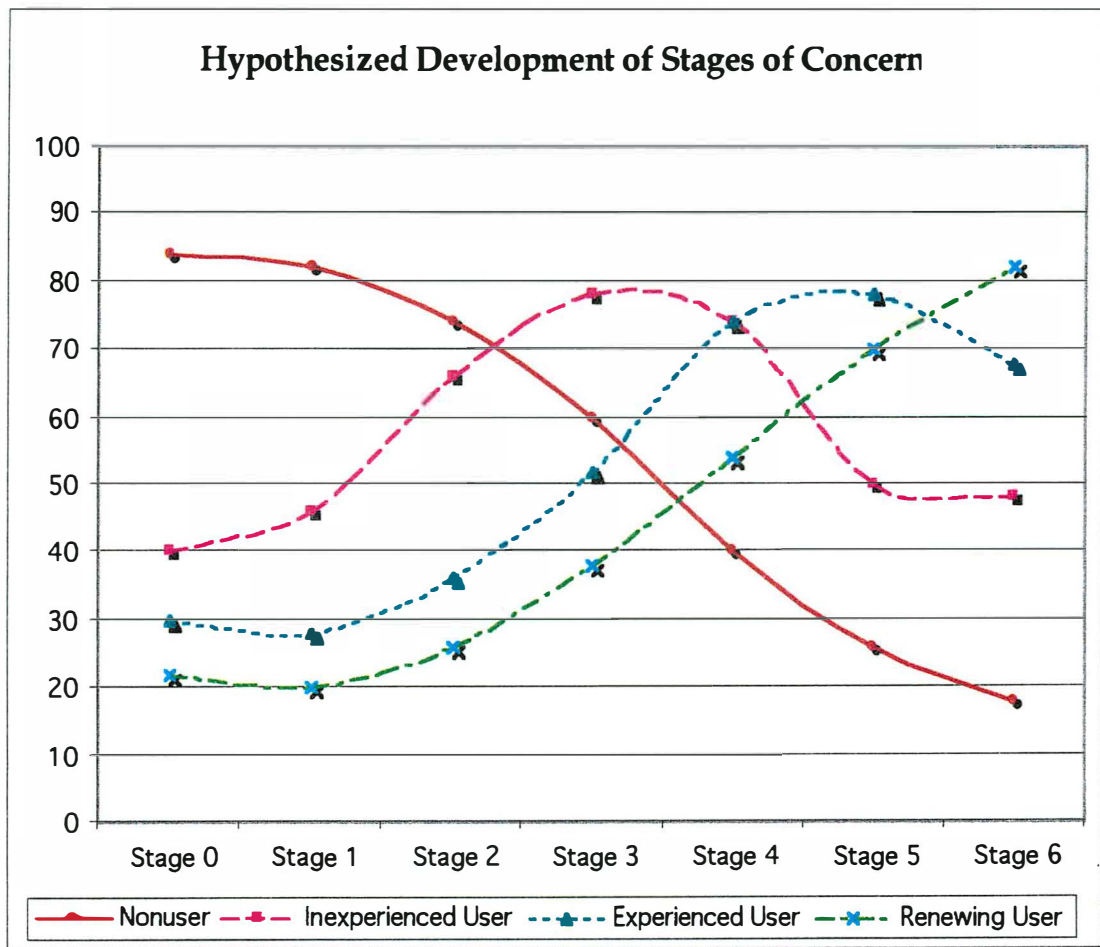


Figure 1. Sample Stages of Concerns Graph

Source: Hall, G, George, A., Rutherford, W. (1979) *Measuring Stages of Concern About the Innovation: A Manual for Use of the SoC Questionnaire*. Austin, Texas: Southeast Educational Development Laboratory.

Data Collection

Method

Data collection was accomplished using a dynamically linked World Wide Web database form, an electronic mail reply, or a traditional paper reply either delivered in person or through the Student Post Office. Sorting and collection of the data was performed with FileMaker Pro database software. Calculations and statistical analysis were conducted with Microsoft Excel spreadsheet and Systat statistical software. Of the 108 full time faculty at the University of the South, 73 responded to the survey request for a return rate of 68%. Two of the returned surveys were not usable leaving a total of 71 surveys for data analysis. This figure represented 66% of the total population. Data collection began with an electronic mail request to the college faculty listserv on February 2, 2000. A reminder was sent to the same listserv on February 9, 2000. Of the 71 surveys used in the data analysis, 38 or 54% of the total, were received by the WWW database, 25 or 35% of the total were received by electronic mail messages, and 8 or 11% of the total were received through the Student Post Office or personal delivery.

Findings

The peak stage of concern for 26.76% or 19 members of the sample group of 71 was Stage 3, Management concerns. The second highest frequency stage of concern was Stage 1, Informational concerns with 25.35% or 18 members of the sample group. The mean stage of concern for all respondents was 2.45 (SD = 1.92). See Table 2 for a summary of the frequency and percentage of the peak stage of concern for respondents.

Table 2. Peak Stage of Concern

Stage (N=71)	F	%
Stage 0-Awareness	12	16.90
Stage 1-Informational	18	25.35
Stage 2-Personal	5	7.04
Stage 3-Management	19	26.76
Stage 4-Consequence	3	4.23
Stage 5-Collaboration	7	9.86
Stage 6-Refocusing	7	9.86
<u>M</u> =2.45		
<u>SD</u> =1.92		

Stage 3 or Management is a task-related concern; attention is directed toward the processes and tasks of using the innovation of instructional technology. Issues of organization, efficiency, managing, scheduling, and making the best use of information and resources (Hall & Hord, 1987) are paramount in Stage 3 concerns.

The percentile scores represented the intensity of concerns. The grouped mean percentiles for each stage of concern presented a slightly different picture. The most intense concern was Stage 1, Information, at an intensity of 70.03 on the percentile chart developed and validated with the SoCQ instrument. The second most intense concern was Stage 3, Management at 65.87. Stage 0, Awareness was a very close third at 64.86. The graph in Figure 3 illustrated the grouped Stages of Concern mean percentile scores. Interpretation of the intensity with the peak stage of concern indicated that while Stage 3 was the peak stage of concern most frequently, Stage 1 concerns tended to be more intense for respondents with high Stage 1 percentile scores.

Second Highest Stage of Concern

The second highest frequency stage of concern was Stage 1 or Informational concerns. This is the first of the self-concerns and indicates awareness about the innovation and interest in learning more details (Hall & Hord, 1987).

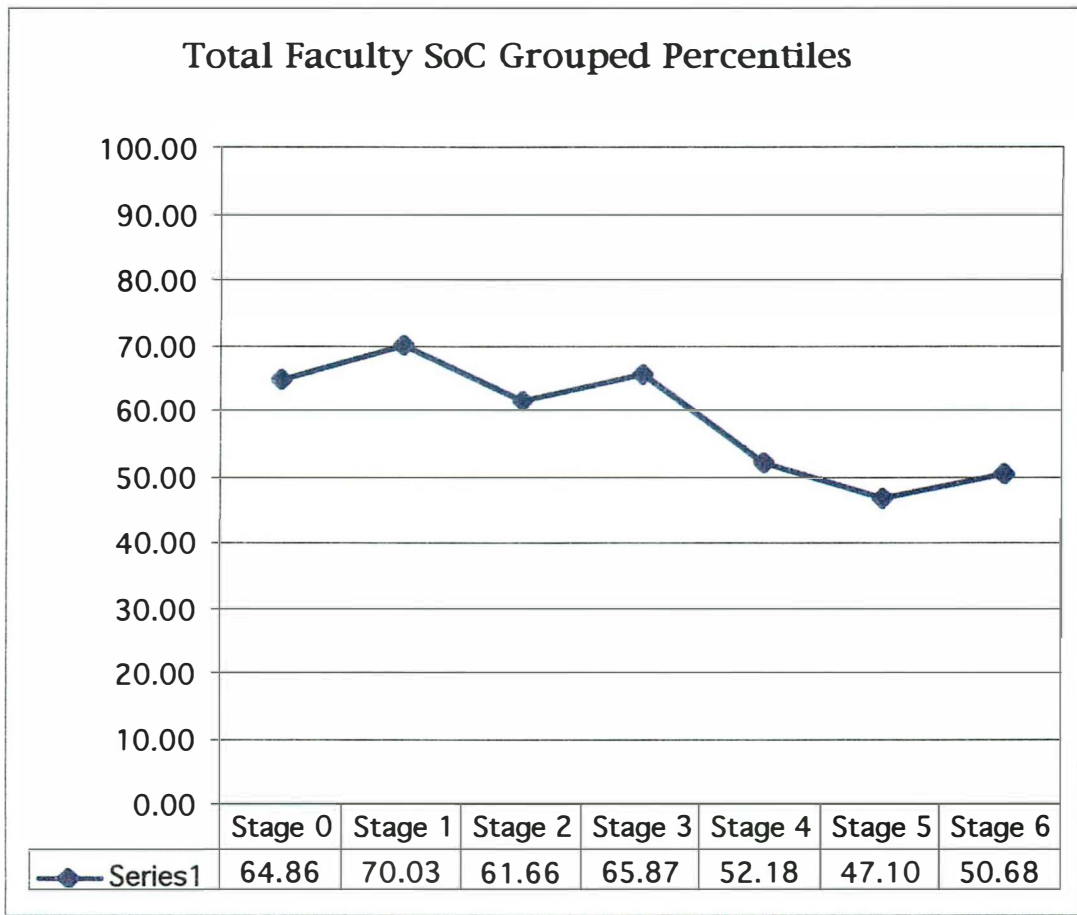


Figure 2. Graph of Grouped Faculty Stages of Concern

The coupling of Stage 3, Management with Stage 1, Informational concerns indicated a general positive attitude toward the use of instructional technology as an innovation. Members of the University of the South faculty sample were expressing a need for organizational and management strategies along with a desire for more information about instructional technology. The closeness of the frequency percentages, 26.76% and 25.35%, suggested that the two concerns were of near equal importance (Hall et al., 1979). Together, frequencies for Stage 3 and Stage 1 as peak concerns accounted for 52.11% of the sample and represented 34% of the total faculty population.

This finding also corresponded to the findings of Toms in an unpublished dissertation at the University of Florida in 1997 (Toms, 1997). In fact, the findings are almost identical in terms of the Stage 3 and Stage 1 relationship although the Florida population was much larger (population=1650, sample=538) and the institution itself was far removed from the small liberal arts environment at the University of the South. The Florida study explored the Stages of Concern toward the use of the Internet as an instructional tool. The fact that faculty from very dissimilar institutions reflected the same stages of concern with a similar distribution toward a technological teaching tool would appear to be an indication that faculty concerns related to instructional technology are not idiosyncratic to a particular institution or environment.

Peak Stage and Second Highest Stage

Table 3 presents a matrix cross-tabulation of the peak stage of concern with the second peak stage of concern as recommended by the SoCQ developers in the interpretation process. According to Hall, the peak stage and the second highest peak stage are commonly grouped in close proximity although not necessarily so. The use of the second highest stage of concern in tandem with the peak stage of concern adds depth to the understanding of the most intense concerns in a group.

Of note in the cross-tabulation matrix was the frequency of Stage 0, Awareness concerns, in the position of second peak stage of concern. Awareness concerns usually indicate little awareness of or involvement with the innovation. According to the Manual for Use of the SoC Questionnaire, intense Stage 0 concerns indicate low concerns, knowledge, or interest in the innovation [1979 #41]. High scores for Stage 0 concerns, however, were interpreted at the 75th percentile or above. The mean grouped percentile score for Stage 0 in the University of the South faculty sample was 64.86.

Demographic Variations: Research Question 2

The second research question guiding this study concerned the relationship of the demographic factors of tenure status, academic rank, and

Table 3. Frequency Distribution of the Second Highest Stage of Concern to Peak Stage of Concern

Peak SoC	Stage 0	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5	Stage 6	Total
Stage 0	0	9	0	2	0	0	1	12
Stage 1	7	0	5	1	2	1	2	18
Stage 2	0	2	0	2	1	0	0	5
Stage 3	6	3	3	0	2	3	2	19
Stage 4	0	0	0	2	0	1	0	3
Stage 5	1	1	1	2	2	0	0	7
Stage 6	1	1	0	2	2	1	0	7
Total	15	16	9	11	9	6	5	71

age with the peak stage of concern. In order to answer the second research question, three hypothesis were formulated:

Hypothesis 1 (H_1). There will be no statistically significant difference in the peak stage of concern of faculty toward the use of instructional technology related to tenure status.

Hypothesis 2 (H_2). There will be no statistically significant difference in the peak stage of concern of faculty toward the use of instructional technology related to academic rank.

Hypothesis 3 (H_3). There will be no statistically significant difference in the peak stage of concern of faculty toward the use of instructional technology related to age.

Chi-square Analysis

Hall et al. (1979) stated that demographic factors have little or no influence upon the stage of concern. The second research question sought to determine whether or not demographic factors were linked to the stage of concern in the sample group.

The Chi-square measurement provided a nonparametric statistical test of the magnitude of the discrepancies between the observed and expected frequencies (Ferguson, 214). The Chi-square test is a measure of squared deviations between observed and theoretical numbers determining whether the deviations are due to sampling error or some interdependence or correlation among the frequencies (Issac, 1983). This measure was useful for determining if the demographic variables of age, academic rank, or tenure status influenced the outcome of the SoCQ peak score.

Hypothesis 1 (H_1)

In order to test the first hypothesis, a chi-square test was performed on the data. Peak Stage of Concern grouped by tenure status was used in the calculation. The chi-square value was 0.776 with 1 Degree of Freedom (DF)

resulting in a probability of 0.38 that tenure was a predictor of stage of concern. The results of the observed distribution compared to the expected distribution are presented in Table 4. The percentage of tenured faculty in the survey was 61% compared to 39% nontenured faculty. The expected distribution was based on comparative percentages of tenured to nontenured faculty in the SoC groupings.

While there were differences in the observed and expected distribution, the chi-square value was not significant at either the $p = .05$ or $.01$ level. However, the number of tenured faculty with a peak stage of concern at Management, Stage 3 was higher than expected. The observed number of nontenured faculty at Stage 1, Information, was also greater than expected.

A graphical comparison of intensity of concerns based on the grouped percentile scores between tenured and nontenured faculty was calculated in Figure 4. The most intense concern for tenured faculty was Stage 3, Management while for nontenured faculty, the most intense concern was Stage 1, Information.

Hypothesis 2 (H_2)

The Chi-square calculation based on academic rank as the grouping value was 9.704 with 3 DF at the 2 percent level. The distribution frequency of peak stage of concern by academic rank is illustrated in Table 5. A probability

Table 4. Peak Stage of Concern by Tenure					
Dependent Variable: Peak SoC					
Grouping Variable: Tenure					
Frequencies:					
	No tenure	Tenure	Total	Expected NT	Expected T
Stage 0	5	7	12	5	7
Stage 1	9	9	18	7	11
Stage 2	3	2	5	2	3
Stage 3	5	14	19	7	12
Stage 4	1	2	3	1	2
Stage 5	3	4	7	3	4
Stage 6	2	5	7	3	4
Total	28	43	71	28	43
Chi-square Value			df	Probability of Chi-square distribution	
0.776			1	.38	

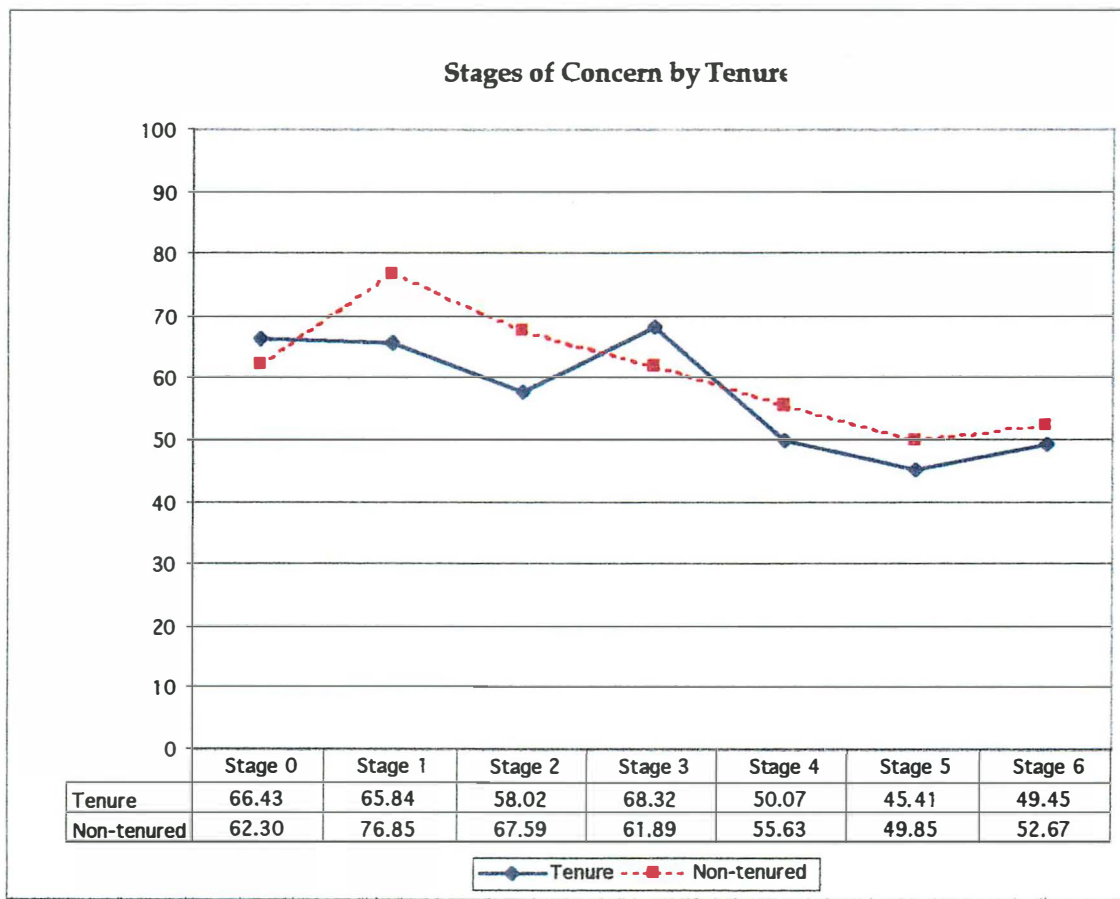


Figure 3. Stages of Concern by Tenure Status

Hypothesis 2 (H_2)

The Chi-square calculation based on academic rank as the grouping value was 9.704 with 3 DF at the 2 percent level. The distribution frequency of peak stage of concern by academic rank is illustrated in Table 5. A probability

of .02 ($p = .02$) existed that peak stage of concern was influenced by academic rank.

The critical values for Chi-square at the .05 and .01 level with 3 degrees of freedom were 7.82 and 11.34. With a Chi-square value of 9.70 significant at the two- percent level, the hypothesis that stage of concern was not significantly influenced by academic rank was rejected.

Professors and associate professors accounted for 15 or 79% of the 19 individuals with peak Stage 3 concerns while instructors and assistant professors accounted for 4 or 21%. The second highest peak, Stage 1 concerns, had 9 or 50% professors, 6% associate professors and 44% instructors and assistant professors.

According to the grouped profiles by academic rank, associate professors were further along the SoC continuum with peak SoC at Stage 3 and second highest peak at Stages 5 and 6, Collaboration and Refocusing. Professors had peak Stage 3, Management concerns with a second peak of Stage 1, Information. Assistant professors peak SoC was Stage 1, Information with a second peak SoC at Stage 2, Personal. Instructors also had a peak SoC at Stage 1 with Stage 0, Awareness, and Stage 5, Collaboration, as the second highest peak SoC.

These findings seem to indicate that with experience in teaching as evidenced by moving from assistant to associate professor, peak SoC concern moved from Stage 1, Information to Stage 3, Management. Usually, a

Table 5. Peak Stage of Concern by Academic Rank**Dependent Variable: Peak SoC****Grouping Variable: Academic Rank****Frequencies:**

	Instructor	Assistant	Associate	Professor	Totals
Stage 0	2	3	0	7	12
Stage 1	3	5	1	9	18
Stage 2	0	4	0	1	
Stage 3	1	3	3	12	19
Stage 4	0	1	0	2	3
Stage 5	2	1	3	1	7
Stage 6	1	1	3	2	7
Totals	9	18	10	34	71

Chi-square Value	DF	Probability of Chi-square distribution
9.704	3	.02

beginning academic appointment is at the assistant professor level and a promotion occurs at the end of seven years to the associate professor level. The fact that associate professors had second peak SoC at Stages 5 and 6 would seem to indicate that associate professors were more advanced in their thinking and use of instructional technology than either less experienced instructors and assistant professors or more experienced professors. See Figure 5 for a graphical representation of the SoC by academic rank.

Hypothesis 3 (H_3)

The Chi-square calculation using age range as the grouping value was 6.705 with 5 DF. The probability of the Chi-square distribution was 0.24 significant at the 24 percent level. Since significance would require a probability at the .05 or .01 level, Hypothesis 3 (H_3) that age range was not a significant predictor of peak SoC was accepted. Table 6 illustrated frequencies of peak SoC grouped by age range.

Profiles of the SoC percentiles were graphed in Figure 6. Of note is the convergence of age range 30-39 and 40-49 with similar intensities of concern. Age range 50-59 also converged with age range 60-70. Generally, the two older age ranges had less intense concerns than did the two younger age ranges.

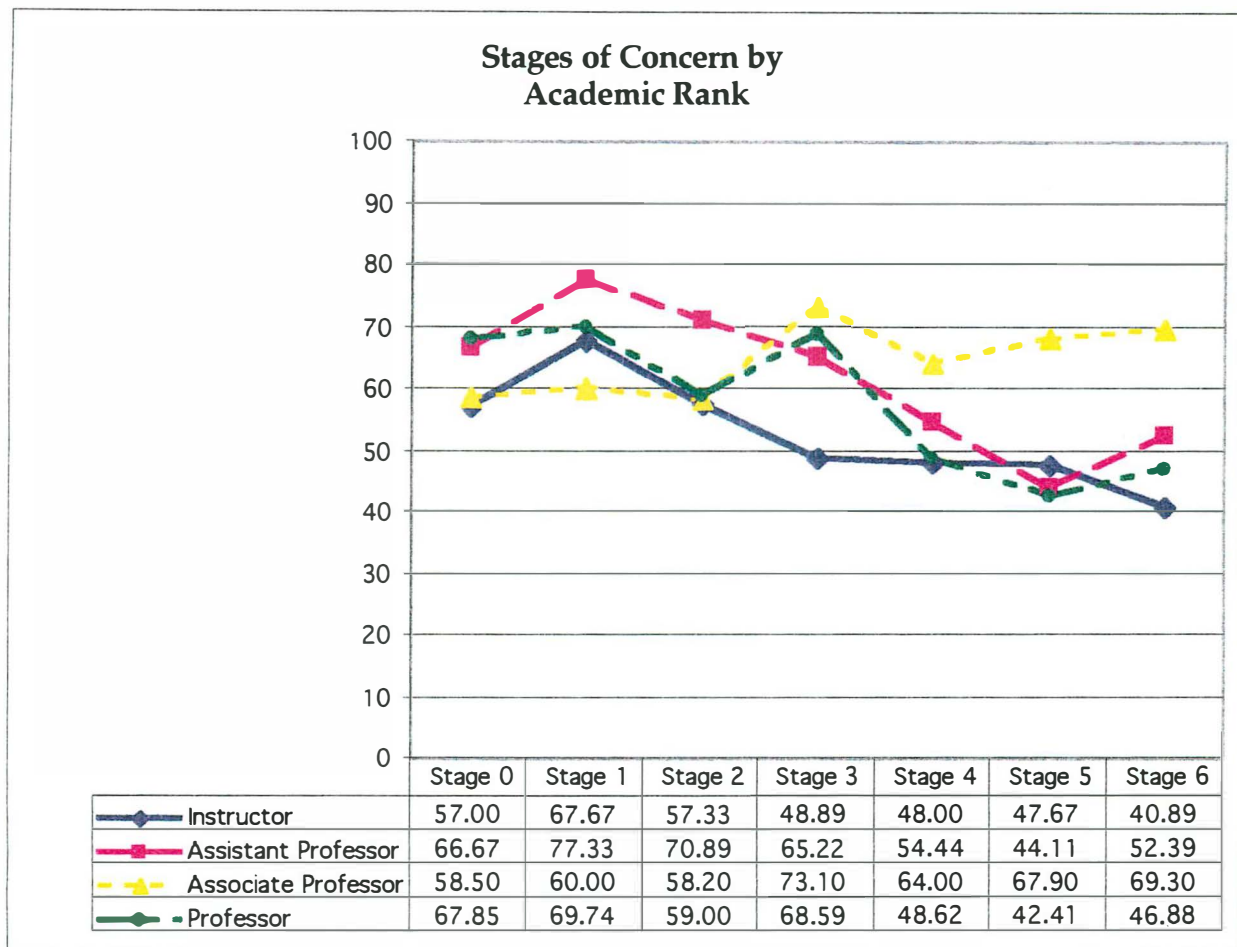


Figure 5. Stages of Concern Percentile Means by Academic Rank

Table 6. Peak Stage of Concern by Age							
Dependent Variable: Peak SoC							
Grouping Variable: Age							
Frequencies:							
	20-29	30-39	40-49	50-59	60-69	70	Total
Stage 0	0	3	0	6	3	0	12
Stage 1	1	4	3	9	1	0	18
Stage 2	0	3	1	0	0	0	5
Stage 3	0	3	7	6	2	0	19
Stage 4	0	0	2	0	0	1	3
Stage 5	0	2	1	4	0	0	7
Stage 6	0	3	1	3	0	0	7
Totals	1	18	15	28	6	1	69
Chi-square Value			DF	Probability of Chi-square distribution			
6.785			5	.24			

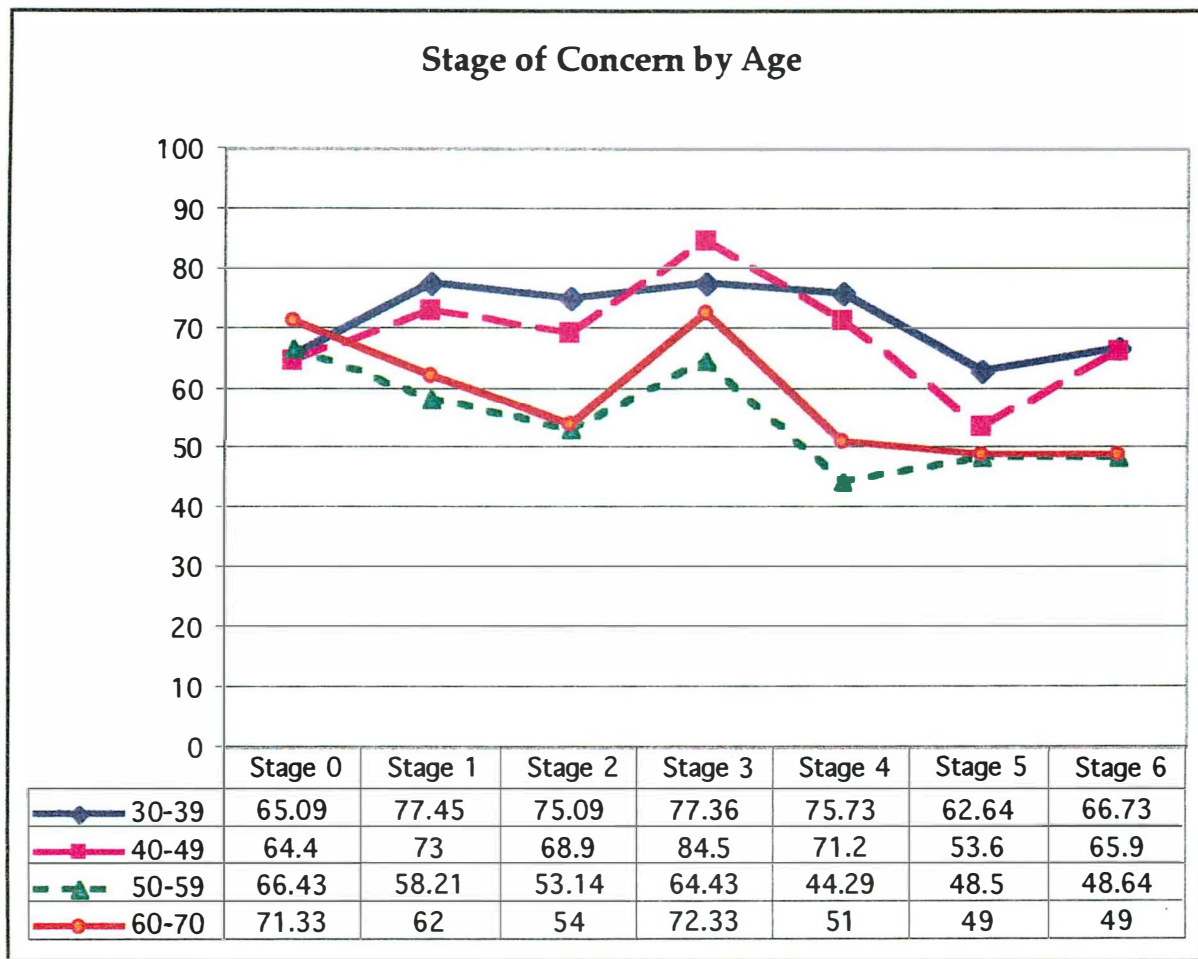


Figure 6. Stage of Concern Percentile Scores by Age

Demographic Variations: Research Question 3

In addition to the demographic variables of rank, tenure, and age, data were also collected on the levels of use of instructional technology to answer research question 3: Were self-reported levels of use, frequency of use, and participation in training significant predictors of stage of concern? In order to answer the second research question, three hypothesis were formulated:

Hypothesis 4 (H_4). There will be no statistically significant difference in the peak stage of concern of faculty toward the use of instructional technology related to levels of use.

Hypothesis 5 (H_5). There will be no statistically significant difference in the peak stage of concern of faculty toward the use of instructional technology related to frequency of use.

Hypothesis 6 (H_6). There will be no statistically significant difference in the peak stage of concern of faculty toward the use of instructional technology related to participation in training.

The chi-square measurement of observed to expected frequencies was applied to the data related to self-reported levels of use, frequency of use, and participation in training.

Hypothesis 4 (H_4)

Levels of use were determined by self-reported ranking of level of use in one of four categories: nonuser, novice user, intermediate user, or master user. The most frequently chosen category was intermediate user, with 32 or

45% of all respondents. The second most frequently selected category was novice user with 22 or 31% of all respondents. Of the 71 responses, 54 or 76% chose either novice user or intermediate user as a descriptor of their use of instructional technology. Only 9 or 13% of respondents chose nonuser as their classification, while 8 or 11% described themselves as master users of instructional technology.

The chi-square value of peak stage of concern grouped by level of use was 2.769 with 3 degrees of freedom, resulting in a probability of .43 significant at the 43 percent level. Thus, self-reported level of use did not have a significant relationship with peak stage of concern. Frequencies of the peak stage of concern by self-reported level of use were tabulated in Table 7. See Figure 7 for a graphical representation of peak Stage of Concern by level of use.

Hypothesis 5 (H_5)

Frequency of use was selected from one of five categories: once a week, once a month, once a semester, once a year, or never. Of the 71 respondents, 32 or 45% chose once a week while 22 or 31% chose once per month but less than once per week. A total of 54 or 76% of the respondents either used instructional technology once per week or at least once per month.

Table 7. Peak Stage of Concern by Level of Use					
Dependent Variable: Peak SoC					
Grouping Variable: Level of Use					
Frequencies:					
	Nonuser	Novice	Intermediate	Master	Total
Stage 0	2	0	8	2	12
Stage 1	3	5	9	1	18
Stage 2	1	2	1	1	5
Stage 3	0	11	4	4	19
Stage 4	0	0	3	0	3
Stage 5	1	3	3	0	7
Stage 6	2	1	4	0	7
Totals	9	22	32	8	71
Chi-square Value	DF		Probability of Chi-square distribution		
2.769	3		.43		

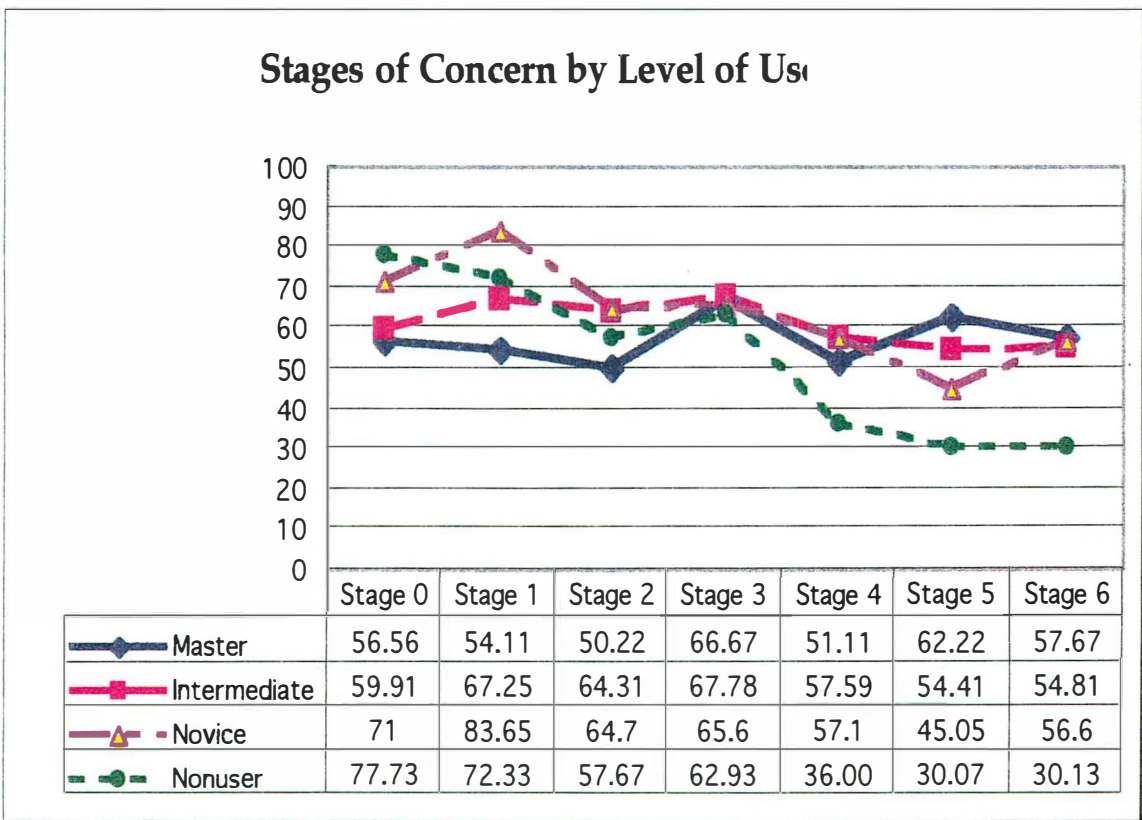


Figure 7. Stages of Concern by Self-Reported Level of Use

The chi-square measure of frequency of use related to peak stage of concern was 12.589 with 4 DF at the 1 percent level resulting in a probability of 0.013 significant at the $p = .01$ level that frequency of use had a significant impact upon the peak stage of concern. Thus, Hypothesis 5 (H_5) that peak stage of concern was unrelated to frequency of use was rejected.

In general, higher peak stage of concern respondents used instructional technology once per week: all 7 of the Stage 6, Refocusing respondents reported using instructional technology at least once per week. Lower stages of concern were split between the various frequencies. Only 9 or 13% of the respondents reported never using instructional technology. Of the 9 never using instructional technology, 2 were at Stage 0, Awareness, 4 at Stage 1, Information, and 3 at Stage 3, Management. This would seem to indicate that increasing frequency of use by respondents was directly related to progression along the continuum of stages of concern. Data related to frequency of use and stage of concern were tabulated in Table 8.

A graphical representation of peak SoC by frequency of use (see Figure 8) illustrated the fact that faculty who never reported using instructional technology had high Stage 0 and 1 concerns and much longer concerns at stages 4, 5, and 6. In contrast, users who reported using instructional technology once per week or more had relatively high intensities of concern at stages 3, 4, 5, and 6.

Table 8. Peak Stage of Concern by Frequency of Use						
Dependent Variable: Peak SoC						
Grouping Variable: Frequency of Use						
Frequencies:						
	Week	Month	Semester	Year	Never	
Total						
Stage 0	4	3	2	1	2	12
Stage 1	3	8	3	0	4	18
Stage 2	3	2	0	0	0	5
Stage 3	9	6	1	0	3	19
Stage 4	2	1	0	0	0	3
Stage 5	4	2	1	0	0	7
Stage 6	7	0	0	0	0	7
Totals	32	22	7	1	9	71
Chi-square Value		DF	Probability of Chi-square distribution			
12.589		4	.01			

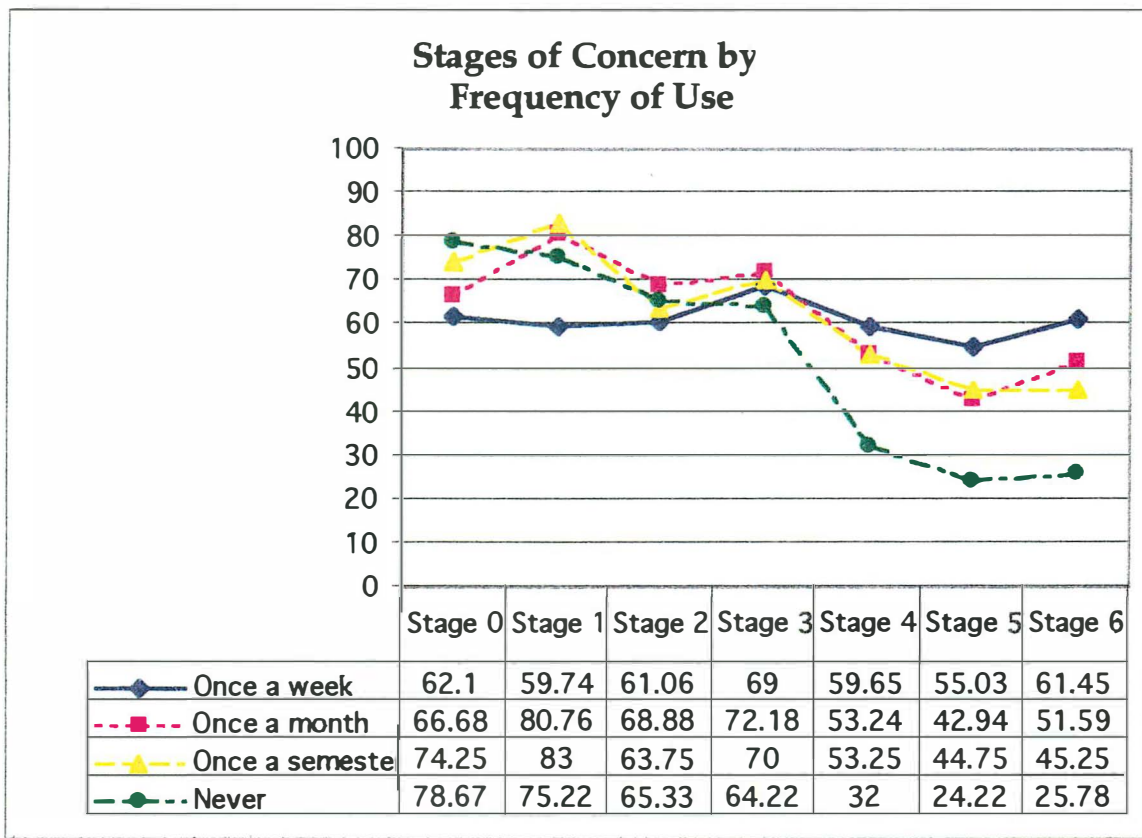


Figure 8. Stages of Concern by Frequency of Use

Hypothesis 6 (H_6)

The chi-square measure of participation in training related to peak stage of concern was 5.315 with 1 DF at the 2 percent level resulting in a probability of 0.021 that participation in training had a significant impact upon the peak stage of concern. Based upon this calculation, the hypothesis that training had no significant impact upon stage of concern was rejected. See Table 9 for frequencies and percentages of respondents reporting participation in training activities.

Table 9. Peak Stage of Concern by Training					
Dependent Variable: Peak SoC					
Grouping Variable: Training					
Frequencies:					
	No (f)	%	Yes (f)	%	Total
Stage 0	9	75	3	25	12
Stage 1	11	61	7	39	18
Stage 2	3	60	2	40	5
Stage 3	8	42	11	58	19
Stage 4	1	33	2	67	3
Stage 5	2	29	5	71	7
Stage 6	3	43	4	57	7
Totals	37		34		71
Chi-square Value	DF	Probability of Chi-square distribution			
5.315	1	.02			

An inverse relationship existed between participation in training and stage of concern. The higher stages were more likely to be made up of individuals with access to training while the lower stages of concern were more likely to (75% at Stage 0) be individuals with no training exposure.

In general, individuals who reported participation in training activities had more intense concerns than those who reported no participation in training. See Figure 9 for a graphical comparison of the two groups. At Stage 1, Information, the two groups scored almost identical intensities (69.27 and 70.85) but in other stages, the group with training had higher intensities of concern. See Figure 9 for a graphical comparison of the two groups.

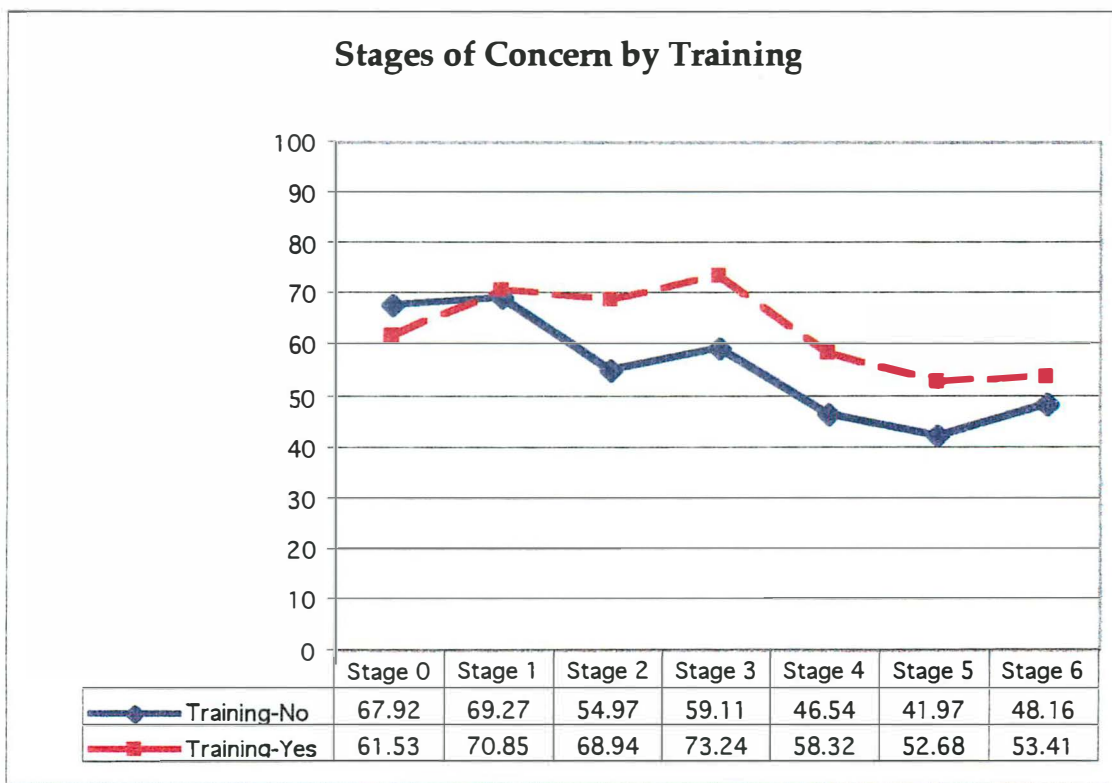


Figure 9. Stages of Concern by Training

Open-ended Questions

Two questions on the survey provided an opportunity for respondents to verbalize their thoughts and feelings about the perceived advantages and disadvantages of the use of instructional technology. Predominate themes emerged for each question.

The responses were read and coded by the researcher in terms of the dominant concerns expressed. Many respondents who chose to answer the open-ended questions tended to write longer, more detailed responses to the first question dealing with the advantages of using instructional technology.

Answers primarily focused on the advantages for student learning. Increased motivation for students, better visualization of concepts, greater access to information, and better communication with students were typical responses.

Responses to the open-ended questions provided a richness of description not available in the survey questions alone. In terms of advantages of using instructional technology, responses varied but were primarily focused on the improvement of student learning. "It makes a connection with students; it opens up research possibilities beyond the resources available at a small liberal arts college; it helps them (students) make connections with each other."

Another individual responded: "The computer can provide additional practice for mechanical skills (such as verb forms and spelling of vocabulary).

The Internet is a good cultural resource for foreign language study (photos, newspapers, radio stations, etc)."

For another professor, instructional technology "provides a means of supporting class presentation with visuals and making that same information available on my homepage; easy communication of syllabus materials and assignments; helps to gain access to important information."

The possibilities of instructional technology beyond the traditional mode of instruction were also important to professors: "Enables presentation of material that cannot otherwise be introduced in a traditional classroom format. For example, in my ...lab students are introduced to statistical software. It would be difficult to explain how to use this software without allowing hands-on opportunities." For another professor the advantage of instructional technology was that it "enables students to do things they couldn't do otherwise in modeling, data analysis, and presentation of results. Permits me to obtain information for class presentation that is not readily available and to present it clearly to the students."

An interesting observation of an advantage of instructional technology was that "it makes learning more 'democratic.'" This observation related to the "cultural" resources available on the Internet and "email partnerships."

The question dealing with the disadvantages of using instructional technology provoked shorter responses in general than did the advantages. The responses, however, tended to more homogeneity than the advantages.

Time, equipment failures, and lack of technical support were almost universally mentioned as the primary disadvantages. Faculty who were optimistic about the possibilities of using technology in teaching, expressed concerns that the lack of a technical "fail-safe" wasted class time and energy. "Technology break-downs/ slow-downs can interrupt preparation and disrupt classroom presentations." From another professor: "It is time-consuming to prepare technology demonstrations for class. When a software/ hardware problem occurs during class, precious time is wasted." In addition to time concerns, another professor also feared that "over-dependence on technological media...may detract from a teacher's ability to be spontaneous in the classroom."

The issue of student responsiveness to technology also surfaced as a potential disadvantage: "Many students seem to feel uncomfortable using computers and are proud of it." In another case, a professor mentioned the "unwillingness of some students (even to check their email)" as a disadvantage.

Broader issues of the impact of instructional technology upon learning were also raised: "If teaching is information transmittal, there are no disadvantages that concern me. Insofar as teaching involves understanding, it's far more complicated. Often grasping concepts and developing ideas entails complex and subtle interactions between teacher and students and

among students. Interacting through a machine is distracting, isolating.

Intensity is lost."

A technology pioneer at the University of the South wrote a thoughtful analysis of the problems of using instructional technology in teaching as well as provided a historical and cultural perspective:

"By 1994, I had decided to go paperless in all my classes. That has been a challenge. I am attempting to go bookless as well. Archaic views of copyright in academia are the biggest obstacle to innovation. In fact, I see attitudinal problems as the central issue, not access to or use of the technology itself. Learning how to use a computer is a small task in comparison to what I call "tertiary software"--not machine instructions and programming (primary software), not applications (secondary software), but all the attitudes from the past that affect or distort or preclude access to or full use of the technology. While tertiary software (mental encoding) can affect the individual user/ learners, its most important effect is upon middle managers and administrators who have the unfortunate generational problem of not being native children of the computer world. ...We have many people who are involved with computers who speak IT language as a second, not first, language: they are very skillful, but they don't THINK in IT metaphors. These people imagine they understand, they are sometimes sympathetic, but they don't really get the picture and are endlessly

trying to impose analogical models of authority upon the technology and its users. Their work ethic is based upon the avoidance of mistakes instead of creativity, and their well-intentioned seriousness of mind stifles learning. These people forever manufacture goblins of fear that preclude the realization of a vision of IT that is endlessly open to the future; they walk backwards into the future using the limited successes of the past as a destructive control on the excitement that is the only way that IT can take place, not as an optional or alternative technology, but as the replacement technology for the Gutenberg Galaxy that has prevailed for 500 years. We are talking about a revolution here, not a tame extension from known variables of an existent technology."

This individual had thought deeply about the use of instructional technology and the impact of information technology upon society as a whole. While this particular essay dealt with the broad and potentially "revolutionary" implications of instructional technology, most of the answers to the open-ended questions dealt primarily with management or Stage 3 issues, which was the peak stage of concern according to data collected from the SoCQ survey instrument. Concerns about time and technical support all relate to the organization and management of resources. This finding reinforces the finding of Stage 3, Management concerns as the peak stage of concern. This finding is also consistent with research conducted by Spotts

[Spotts, 1999 #63] concerning the primary issues for faculty using technology in teaching. Spotts found that time and technical support were issues of paramount importance.

Verification of Peak Stage of Concern

The survey open-ended questions relating to the advantages and disadvantages of using instructional technology also provided verification for the peak stage of concern as a task-related issue. The most frequently cited disadvantage was the need for more time to learn to use instructional technology. The second most frequently cited disadvantage was the lack of technical support and resources. Both of these issues were related to the mechanics and management of using instructional technology and were highly task-oriented. The advantages described in the open-ended questions also relate primarily to task and management issues. The most prevalent comments related to improvements in presentation and visualization for students and access to more information resources.

Summary

In this chapter, findings obtained from the data generated by the Stages of Concern Questionnaire were reported. The peak stage of concern for faculty at the University of the South was at Stage 3 or Management. The second highest stage of concern was Stage 1 or Informational.

Statistical analysis was performed on the demographic factors to determine if there were relationships between demographic factors and peak stage of concern. Relationships defined by the statistical analysis included the observation that the peak stage of concern for tenured faculty was Stage 3, Management, a task concern, while the peak stage of concern for nontenured faculty was at Stage 1, Informational, a self-concern.

Chi-square measurement further revealed that academic rank and age range were significant predictors of stage of concern. Experienced faculty at the associate level had more intense and advanced stages of concern than either less experienced or more experienced faculty.

The demographic section of the survey included a question requiring self-ranking in terms of level of use of instructional technology. The choices were nonuser, novice, intermediate, or master. Chi-square analysis revealed no significance between self-ranking and stage of concern. However, frequency of use and participation in training were significant factors in the stage of concern of liberal arts faculty toward instructional technology.

Additionally, open-ended questions related to the advantages and disadvantages of using instructional technology elicited qualitative descriptions of faculty perceptions related to instructional technology.

Disadvantages and problems with instructional technology included time needed to learn new software and hardware and technical support and reliability issues as well as concerns related to the mechanical nature of the computer as a machine.

Advantages of using instructional software included greater visualization of difficult material and availability of new sources of information via the Internet. Increased student motivation and learning were frequently cited as advantages of utilizing technology in the instructional process.

CHAPTER FIVE

Summary, Conclusions, And Recommendations

Introduction

This chapter begins with a summary of the research, the methodology used, and a re-statement of the findings. Conclusions related to the research data and recommendations for further research conclude this study.

This quantitative, descriptive research study surveyed the full-time faculty at the University of the South in Sewanee, Tennessee using the Stages of Concern Questionnaire (SoCQ). The SoCQ is an instrument developed at the University of Texas Research and Development Center for use with the Concerns-based Adoption Model.

The Concerns-based Adoption Model hypothesized that concerns toward an innovation progress through predictable stages or phases. Stages of Concern are: Stage 0- Awareness, Stage 1-Informational, Stage 2- Personal, Stage 3- Management, Stage 4-Consequence, Stage 5-Collaboration, and Stage 6-Refocusing

The survey was sent out to faculty at the University of the South in Sewanee, Tennessee as an electronic mail message with three options for return. The survey was available at a web site designed by the researcher at <http://forum1.sewanee.edu/CBAM/>. Respondents could either chose to complete the survey online via the World Wide Web or they could reply to the electronic mail message. A third option was to print out the survey and return it via the Student Post Office or SPO.

Of the 108 full-time faculty members, 71 completed surveys were returned for a response rate of 66%. Analysis of the demographic data with a chi-square measurement revealed that academic rank and age range were predictors of peak stage of concern while frequency of use and participation in training activities were usage indicators that significantly were connected to peak stage of concern.

Analysis of the open-ended questions revealed affirmation of the SoCQ findings that the peak stages of concern for faculty were Stage 3 Management and Stage 1 Informational. Answers to questions about perceived advantages of instructional technology focused on the visualization of information, motivation for students, better access to information, and better communication. Disadvantages focused on concerns related to time and technical support.

Conclusions and Implications

The Stages of Concern Questionnaire worked well as an instrument to gather information about faculty. The survey did not take a great deal of time to complete, an important consideration for busy professors.

The data gleaned from the survey was useful and for the most part, predictable although demographic factors of academic rank and age range were determined to be significant predictors of peak stage of concern in spite of the fact that Hall et al (1979, 1987) stated that demographic factors are unrelated to peak stage of concern.

If, as the SoCQ and CBAM model theorizes, the process of change is personal, it seems unlikely that certain demographic factors would NOT be related to scores on the SoCQ. Demographic factors were after all, in essence, a description of personal characteristics. If change were a personal process, then demographic characteristics would have to have a relationship to individual stages of concern.

Questions about the Instrument

While the SoCQ proved useful for this study, there were some problems with the survey as a data-gathering instrument. The questions frequently seemed to be confusing to respondents. Of particular concern was a question in the Refocusing stage:

Question (20), I would like to revise the instructional approach of using instructional technology.

At least seven faculty members either called the researcher on the telephone or wrote a note on the survey form to explain that they did not understand the question. This may be related to the fact that the SoCQ was developed as a generic instrument to be used with any innovation. When the term instructional technology was used in place of the generic innovation, the sentence became confusing.

An instrument developed specifically for analyzing concerns related to the use of instructional technology might prove to be as valuable as the SoCQ and could provide more detailed, sensitive information related specifically to instructional technology and innovation.

Data Collection Techniques

Online Database

The process of collecting data on the concerns of faculty toward the use of instructional technology was an invaluable experience. The data and the technique used by the researcher would benefit planning strategies and the assessment of faculty needs related to instructional technology.

The use of the online database proved both useful and convenient for the researcher and the respondents. This process could be used in a number

of ways to gather information from faculty (or from another population). The information was secure (or at least as secure as networked digital information can be) and was immediately available in a format that was sortable and ready for data analysis with statistical software. Further work on the programming aspects of the data collection component could focus on the development of an online instrument which automatically calculated and diagnosed faculty concerns. A prescriptive element could also be developed as an integral part of the diagnostic tool to inform faculty of learning, coordination, or collaboration opportunities.

Recommendations for Further Research

Longitudinal Studies

Longitudinal studies utilizing the CBAM model with a group of college faculty would be useful in terms of assessment of the CBAM framework as a research and development model. Several longitudinal studies exist for elementary and secondary teachers (Hall & Hord, 1987; Hord et al., 1987; Horsley & Loucks, 1998) but an example of a longitudinal study using college faculty as the population could not be found by this researcher.

The longitudinal information would be useful for assessing staff development delivered as a result of SoCQ peak stages. Theoretically, faculty should show progression through the stages of concern in a systematic way at least in relation to the chosen innovation, instructional technology.

Need for further testing of SoCQ with college faculty

Much of the literature related to use of the CBAM has occurred with elementary and secondary educators. There are far fewer studies that used the SoCQ and CBAM model with higher education faculty. Due to the analytical and critical nature of college faculty, it would be useful to develop an instrument specifically related to the language and issues of college faculty.

The use of computers and networked information will continue to impact the lives of college faculty for many years to come (Gillespie, 1998). The proliferation of online courses, virtual universities, and web-based information exchange necessitates training and development for college faculty in the use of new pedagogical tools and strategies specific to the electronic world. Any tool to streamline and improve staff development in the area of developing expertise in the use of instructional technology would be advantageous for college faculty at any type of institution.

Use of the SoC as a Diagnostic Tool for IT Planning

The use of the SoCQ instrument as an element in an overall plan for support of an instructional technology program was indicated as a possibility by this research study. The ability to define the stage of concern when

planning training or support activities would be advantageous to an academic or instructional technology unit in a university or college. The information needs of an individual at Stage 3 are much different than information needs at Stage 0. Issues of organization, time, and management of an innovation are far removed from awareness or Stage 0 issues. In the same manner, issues related to Collaboration or Renewal and Refocusing are substantially different than Management issues.

Training in colleges and universities, as well as most schools, has traditionally been accomplished by putting everyone together in large group training sessions. A diagnosis of concerns and attitudes prior to training activities could enable learning sessions to specifically address issues and problems relevant to the individual rather than the current hit-or-miss approach. The use of the SoCQ and the CBAM model of concerns theory would allow for an expedient and efficient method of diagnosing and addressing concerns. According to the basic tenets of change theory [Rogers, 1995 #8], an important part of the change process is the determination of compatibility and adaptability of the innovation to the individual. The use of the SoCQ and CBAM model could facilitate and enhance the experience of determining the usefulness of instructional technology as an innovative practice.

Student Concerns

The issue of student concerns and attitudes toward the use of instructional technology is one that is almost never addressed in the research literature related to the use of technology in education. The mention of student attitudes in the open-ended questions as problematic indicates that further investigation of student attitudes toward instructional technology could be useful. Often the assumption is made that younger individuals automatically know about computers and are technologically literate. However, this may not be the case [Brosnan, 1998 #9]. A deeper understanding of the attitudes students have toward the use of technology in the learning process could only inform and improve the implementation in the classroom.

Summary

This chapter presented a summation of the study undertaken in relation to the issue of faculty concerns about the use of instructional technology at a small liberal arts college in Tennessee. This issue is of importance in light of the tremendous resources expended nation-wide on the use of instructional technology. Before attempts can be made to assess the effectiveness of instructional technology, information on the actual techniques employed by professors in the classroom will be necessary. A first step

toward gathering such data and utilizing it to make informed, rational decisions will be the collection of more information about the concerns of faculty toward using technology in teaching.

Rather than proceeding with the infusion of technology in teaching completely from the vantage point of the change advocate, change should proceed from an informed and sensitive understanding of those being asked to change. Information from the group of professors subjected to the change process should prove invaluable in this undertaking.

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APPENDICES

Appendix 1

2/2/2000

Dear Colleagues,

In order to complete work on my dissertation at the University of Tennessee in Knoxville, I am asking for your cooperation and help. I am investigating faculty concerns and attitudes toward the use of instructional technology. The information will also help in planning activities within the ITW.

There are three ways that you can complete the survey:

1. Access the questions and submit answers using the Internet at the following address:

<http://forum1.sewanee.edu:591/CBAMWEB/>

(The earlier message did not have the survey attached).

2. Download the attached Word document and email it back to me at vsellsle@sewanee.edu

3. Download and print the attached Word document and send it to me using the SPO.

The information gathered in this survey will be completely confidential. No identifying information will be used in my dissertation, the ITW, or for any other purposes.

If you have any questions or concerns, please do not hesitate to contact me.

Thank you for your help,

Vicki

Appendix 2

2/9/2000

Dear Colleagues,

I have received a number of responses to my instructional technology survey and I appreciate your time and effort. Thank you!

In order to complete my dissertation in a timely fashion, I need to have all survey answers by Monday, February 14, 2000. If you have not yet completed the survey, I would appreciate it very much if you could do so by Monday.

The online version of the survey is at <http://forum1.sewanee.edu:591/CBAMWEB/> OR you may download the attached Word document and either email it to me OR download and print and return it to me via the SPO.

I appreciate your help with this project.

Vicki

Appendix 3

Concerns-based Adoption Model (CBAM) Questionnaire

The Diffusion of Instructional Technology

This survey is an important part of my dissertation work for the EdD. degree from the College of Education at the University of Tennessee in Knoxville. The information gathered in this survey will also help inform the practices of the Instructional Technology Workshop at Sewanee.

The survey is designed to collect information about faculty attitudes and concerns about the use of instructional technology in teaching. It should take approximately fifteen to twenty minutes to complete. All answers will be completely confidential. Identifying information is only for the purpose of tracking response rate and will not be used in either my dissertation, the ITW, or for any other purposes. Thank you for your time and cooperation.

Vicki Sells-Lewallen

The purpose of this questionnaire is to gather information about concerns related to the use of an innovation. In this case the innovation I am investigating is the use of instructional technology in the classroom. Questions 1 through 35 were developed from typical responses of school and college teachers who ranged from no knowledge at all about various innovative programs to many years experience using them. This instrument was developed and validated at the Research and Development Center at the University of Texas at Austin.

Some of the items on this questionnaire may appear to be of little relevance or irrelevant to you at this time. For the completely irrelevant items, please check "0" on the scale. Other items will represent those concerns you do have, in varying degrees of intensity, with 7 being the most relevant. Circle the number which corresponds to your level of concern. For example:

This statement is very true of me at this time.	0 1 2 3 4 5 6 7
This statement is somewhat true of me now.	0 1 2 3 4 5 6 7
This statement is not at all true of me at this time.	0 1 2 3 4 5 6 7
This statement seems irrelevant to me.	0 1 2 3 4 5 6 7

Please respond to the items in terms of your present concerns, or how you feel about your involvement or potential involvement with Instructional Technology.

The definition of instructional technology for the purpose of this study will include the use of computers in instruction, including the use of the Internet. This definition does not include the use of ANY technology but rather only technology related to the use of computers and the Internet. Older technologies such as slide projectors, video, etc, are NOT included in the definition for the purpose of this survey.

Name: _____

What is your department? _____

Highest degree earned:

Bachelor____ Masters____ Doctorate____

Total years teaching:_____

What is your age?

20-29____30-39____40-49____50-59____60-69____Over 70____

Number of years at the University of the South: _____

What is your rank?

Instructor____Assistant Professor____Associate
Professor____Professor_____

Do you have tenure? ____Yes ____No

Do you use instructional technology in the classroom? Yes____No____

Describe your use of instructional technology:

nonuser____ novice____ intermediate____ master____ former
user_____

How many years have you used instructional technology?_____

Do you routinely use computers? Yes____No____

List any software applications that you routinely use:

How often do you use instructional technology?

Once a week or more____

Once a month or more but less than once per week ____

Once a semester or more but less than once a month ____

At least once a year but not in the same semester____

Never____

Have you received formal training in using instructional technology (workshops, seminars, conferences, courses)?

Yes____No____

Describe the advantages of using instructional technology?

Describe the disadvantages or barriers to using instructional technology?

Stages of Concern Questionnaire Items

7= Very True 4= Somewhat True 1= Not True 0= Irrelevant

1. I am concerned about students' attitudes towards instructional technology.

0 1 2 3 4 5 6 7

2. I now know of some other approaches that might work better.

0 1 2 3 4 5 6 7

3. I don't even know what instructional technology is.

0 1 2 3 4 5 6 7

4. I am concerned about not having enough time to organize myself each day.

0 1 2 3 4 5 6 7

5. I would like to help other faculty in their use of instructional technology.

0 1 2 3 4 5 6 7

6. I have a very limited knowledge of instructional technology.

0 1 2 3 4 5 6 7

7. I would like to know the effect on my professional status.

0 1 2 3 4 5 6 7

8. I am concerned about conflict between my interests and my responsibilities.

0 1 2 3 4 5 6 7

9. I am concerned about revising my use of instructional technology.

0 1 2 3 4 5 6 7

10. I would like to develop working relationships with both our faculty and outside faculty using instructional technology.

0 1 2 3 4 5 6 7

11. I am concerned about how instructional technology. affects students.

0 1 2 3 4 5 6 7

12. I am not concerned about instructional technology.

0 1 2 3 4 5 6 7

13. I would like to know who will make decisions about the use of instructional technology.

0 1 2 3 4 5 6 7

14. I would like to discuss the possibility of using instructional technology.

0 1 2 3 4 5 6 7

15. I would like to know what resources are available if we decide to adopt instructional technology.

0 1 2 3 4 5 6 7

16. I am concerned about my inability to manage all that the use of instructional technology requires.

0 1 2 3 4 5 6 7

17. I would like to know how my teaching or administration is supposed to change.

0 1 2 3 4 5 6 7

18. I would like to familiarize other departments or persons with the progress of this new approach.

0 1 2 3 4 5 6 7

19. I am concerned about evaluating my impact on students.

0 1 2 3 4 5 6 7

20..I would like to revise the innovation's instructional approach.

0 1 2 3 4 5 6 7

21. I am completely occupied with other things.

0 1 2 3 4 5 6 7

22. I would like to modify our use of instructional technology based on the experiences of our students.

0 1 2 3 4 5 6 7

23. Although I don't know about instructional technology, I am concerned about things in this area.

0 1 2 3 4 5 6 7

24. I would like to excite my students about their part in this approach.

0 1 2 3 4 5 6 7

25. I am concerned about time spent working with nonacademic problems related to instructional technology.

0 1 2 3 4 5 6 7

26. I would like to know what the use of instructional technology will require in the immediate future.

0 1 2 3 4 5 6 7

27. I would like to coordinate my effort with others to maximize the effects of instructional technology.

0 1 2 3 4 5 6 7

28. I would like to have more information on time and energy commitments required by instructional technology.

0 1 2 3 4 5 6 7

29. I would like to know what other faculty are doing in this area.

0 1 2 3 4 5 6 7

30. At this time, I am not interested in learning about instructional technology.

0 1 2 3 4 5 6 7

31. I would like to determine how to supplement, enhance, or replace instructional technology.

0 1 2 3 4 5 6 7

32. I would like to use feedback from students to change the use of instructional technology.

0 1 2 3 4 5 6 7

33. I would like to know how my role will change when I am using instructional technology.

0 1 2 3 4 5 6 7

34 Coordination of tasks and people is taking too much of my time.

0 1 2 3 4 5 6 7

35. I would like to know how instructional technology is better than what I am doing now.

0 1 2 3 4 5 6 7

**Please return this survey to vsellsle@sewanee.edu OR print and return to Vicki Sells-Lewallen via the SPO.
Thank you.**

Concerns-based Adoption Model (CBAM) Questionnaire

The Diffusion of Instructional Technology

This survey is an important part of my dissertation work for the EdD degree from the College of Education at the University of Tennessee in Knoxville. The information gathered in this survey will also help inform the practices of the Instructional Technology Workshop at Sevier.

The survey is designed to collect information about faculty attitudes and concerns about the use of instructional technology in teaching. It should take approximately fifteen to twenty minutes to complete.

All answers will be completely confidential. Identifying information is only for the purpose of tracking response rate and will not be used in either my dissertation, the ITW, or for any other purposes.

Thank you for your time and cooperation.

Wicki Sells-Lowallen



Take the Stages of Concern Questionnaire

Please click on the link to complete the survey.

If you have questions about my research, please do not hesitate to contact me at vsells@sevier.edg or by calling x3220.

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Stages of Concern Questionnaire

Stages of Concern Questionnaire: Instructional Technology

The purpose of this questionnaire is to gather information about concerns related to the use of an innovation. In this case the innovation I am investigating is the use of instructional technology as a teaching tool. Questions 1 through 35 were developed from typical responses of school and college teachers who ranged from no knowledge at all about various programs to many years experience using them. This instrument was developed and validated at the Research and Development Center at the University of Texas at Austin.

Some of the items on this questionnaire may appear to be of little relevance or irrelevant to you at this time. For the completely irrelevant items, please check "0" on the scale. Other items will represent those concerns you do have, in varying degrees of intensity, with 7 being the most relevant. Select the radio button which corresponds to your level of concern. For example:

☐ This statement is very true of me at this time	Select 7 if the statement is very true
☐ This statement is somewhat true of me now	Select 4 if the statement is somewhat true
☐ This statement is not at all true of me at this time	Select 1 if the statement is not true
☐ This statement seems irrelevant to me.	Select 0 if the item is irrelevant

Please respond to the items in terms of your present concerns, or how you feel about your involvement or potential involvement with instructional technology. I am most interested in your initial reaction to the question. The questionnaire is designed to diagnose levels of concern related to the adoption of an innovation in seven different categories.

The definition of instructional technology for the purpose of this study will include the use of computers in instruction, including the use of the Internet. This definition does not include the use of ANY technology but rather only technology related to the use of computers and the Internet. Other technologies such as slide projectors, video, etc, are NOT included in the definition for the purpose of this survey.

Questions 1-35 are part of the Stages of Concerns Questionnaire developed at the Research and Development Center, The University of Texas at Austin.

Name:

Department:

Highest degree earned: ☐ Bachelor ☐ Masters ☐ Doctorate

What is your age?: ☐ 20-29 ☐ 30-39 ☐ 40-49 ☐ 50-59 ☐ 60-69 ☐ 70 or over

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Total years teaching:

Number of years at The University of the South:

What is your academic rank? ☐ Instructor ☐ Assistant Professor ☐ Associate Professor ☐ Professor

Do you have tenure? ☒ Yes ☐ No

Do you use instructional technology in the classroom? ☐ Yes ☐ No

Describe your use of instructional technology: ☐ Non-user ☐ Novice ☐ Intermediate ☐ Master ☐ Former user

How many years have you used instructional technology?

Do you routinely use computers? ☐ Yes ☐ No

List any software applications that you routinely use:

How often do you use instructional ☐ Once a week or more ☐ Once a month or more but less than once per week ☐ Once a semester or more but less than once a

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Have you had formal training in the use of instructional technology? ☐ Yes ☐ No

Describe the advantages of using instructional technology:

Describe the disadvantages/barriers to using instructional technology:

Question 1:
I am concerned about students' attitudes towards instructional technology.

0 0 0 1 0 2 0 3 0 4 0 5 0 6 0 7

Question 2:
I now know of some other approaches that might work better

0 0 0 1 0 2 0 3 0 4 0 5 0 6 0 7

7= Very True
4= Somewhat True
1= Not True
0= Irrelevant

7= Very True
4= Somewhat True
1= Not True
0= Irrelevant

7= Very

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Question 3: I don't even know what instructional technology is.	☐ 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7	7= Very True 4= Somewhat True 1= Not True 0= Irrelevant
Question 4: I am concerned about not having enough time to organize myself each day.	☐ 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7	7= Very True 4= Somewhat True 1= Not True 0= Irrelevant
Question 5: I would like to help other faculty in their use of instructional technology.	☐ 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7	7= Very True 4= Somewhat True 1= Not True 0= Irrelevant
Question 6: I have a very limited knowledge of instructional technology.	☐ 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7	7= Very True 4= Somewhat True 1= Not True 0= Irrelevant
Question 7: I would like to know the effect on my professional status.	☐ 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7	7= Very True 4= Somewhat True 1= Not True 0= Irrelevant
Question 8: I am concerned about conflict between my	☐ 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7	7= Very True 4= Somewhat True

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Question 9: I am concerned about revising my use of instructional technology.	☐ 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7	7= Very True 4= Somewhat True 1= Not True 0= Irrelevant
Question 10: I would like to develop working relationships with both our faculty and outside faculty using instructional technology.	☐ 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7	7= Very True 4= Somewhat True 1= Not True 0= Irrelevant
Question 11: I am concerned about how instructional technology affects students.	☐ 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7	7= Very True 4= Somewhat True 1= Not True 0= Irrelevant
Question 12: I am not concerned about instructional technology.	☐ 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7	7= Very True 4= Somewhat True 1= Not True 0= Irrelevant
Question 13: I would like to know who will make decisions about the use of instructional technology.	☐ 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7	7= Very True 4= Somewhat True 1= Not True 0= Irrelevant
Question 14: I would like to discuss the possibility of using instructional	☐ 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7	7= Very True 4= Somewhat True 1= Not True 0= Irrelevant

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Question 15: I would like to know what resources are available if we decide to adopt instructional technology.	☐ 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7	7= Very True 4= Somewhat True 1= Not True 0= Irrelevant
Question 16: I am concerned about my inability to manage all that the use of instructional technology requires.	☐ 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7	7= Very True 4= Somewhat True 1= Not True 0= Irrelevant
Question 17: I would like to know how my teaching or administration is supposed to change.	☐ 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7	7= Very True 4= Somewhat True 1= Not True 0= Irrelevant
Question 18: I would like to familiarize other departments or persons with the progress of instructional technology.	☐ 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7	7= Very True 4= Somewhat True 1= Not True 0= Irrelevant
Question 19: I am concerned about evaluating my impact on students.	☐ 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7	7= Very True 4= Somewhat True 1= Not True 0= Irrelevant
Question 20: I would like to revise instructional	☐ 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7	7= Very True 4= Somewhat True

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Question 21: I am completely occupied with other things.	☐ 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7	4= Somewhat True 1= Not True 0= Irrelevant
Question 22: I would like to modify our use of instructional technology based on the experiences of our students.	☐ 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7	7= Very True 4= Somewhat True 1= Not True 0= Irrelevant
Question 23: Although I don't know about instructional technology, I am concerned about things in this area.	☐ 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7	7= Very True 4= Somewhat True 1= Not True 0= Irrelevant
Question 24: I would like to excite my students about their part in this approach.	☐ 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7	7= Very True 4= Somewhat True 1= Not True 0= Irrelevant
Question 25: I am concerned about time spent working with nonacademic problems related to instructional technology.	☐ 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7	7= Very True 4= Somewhat True 1= Not True 0= Irrelevant
Question 26: I would like to know what the use of instructional technology will require in the immediate	☐ 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7	7= Very True 4= Somewhat True 1= Not True 0= Irrelevant

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Question 27: I would like to coordinate my effort with others to maximize the effects of instructional technology.	☐ 0 ☐ 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7	7= Very True 4= Somewhat True 1= Not True 0= Irrelevant
Question 28: I would like to have more information on time and energy commitments required by instructional technology.	☐ 0 ☐ 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7	7= Very True 4= Somewhat True 1= Not True 0= Irrelevant
Question 29: I would like to know what other faculty are doing in this area.	☐ 0 ☐ 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7	7= Very True 4= Somewhat True 1= Not True 0= Irrelevant
Question 30: At this time, I am not interested in learning about instructional technology.	☐ 0 ☐ 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7	7= Very True 4= Somewhat True 1= Not True 0= Irrelevant
Question 31: I would like to determine how to supplement, enhance, or replace instructional technology.	☐ 0 ☐ 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7	7= Very True 4= Somewhat True 1= Not True 0= Irrelevant
Question 32: I would like to use feedback from students to change the	☐ 0 ☐ 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7	7= Very True 4= Somewhat True 1= Not True 0= Irrelevant

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I would like to use feedback from students to change the use of instructional technology. ☐0☐0☐1☐2☐3☐4☐5☐6☐7

4= Somewhat True
1= Not True
0= Irrelevant

Question 33:
I would like to know how my role will change when I am using instructional technology. ☐0☐0☐1☐2☐3☐4☐5☐6☐7

7= Very True
4= Somewhat True
1= Not True
0= Irrelevant

Question 34:
Coordination of tasks and people is taking too much of my time. ☐0☐0☐1☐2☐3☐4☐5☐6☐7

7= Very True
4= Somewhat True
1= Not True
0= Irrelevant

Question 35:
I would like to know how the use of instructional technology is better than what I am doing now. ☐0☐0☐1☐2☐3☐4☐5☐6☐7

7= Very True
4= Somewhat True
1= Not True
0= Irrelevant

Submit Answers Click on the Submit Answers button when you complete the survey. Thank you.

Questions 1-35 are part of the Stages of Concerns Questionnaire
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Procedures for Adopting Educational Innovations/CBAM Project
Research and Development Center, The University of Texas at Austin

Thank you for your participation. If you have questions or comments, email Vicki Sells-Lewallen, vsells@sewanee.edu

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APPENDIX 4

Joyce Pollard, Ed.D.
Director
Office of Institutional Communications
and Policy Services
Southwest Educational Development
Laboratory
211 E. Seventh St.
Austin, TX 78701-3281

Dear Dr. Pollard:

I am requesting permission to reprint/reproduce (in the case of videotapes) the following:

Concerns-based Adoption Model (CBAM)
Self-Questionnaire and LOU interview

I intend to use the reprinted/reproduced information in the following way/with the designated audience (please attach examples):

Survey of University of the South faculty
as part of my doctoral (EdD) dissertation
at the University of Tennessee, Knoxville

In the case of a videotape, I agree to duplicate the tape in its entirety without editing, splicing, or obliterating SEDL's copyright. I further agree to use or distribute the copies at no cost to the designated audience(s). Finally, I agree to give appropriate attribution (citations or reference) to the Southwest Educational Development Laboratory.

Name: Vicki Sells-Lewallen

Address: 735 University Avenue
Sewanee, TN 37383

Telephone Number: 931-598-3220

E-mail: vsells@sewanee.edu

APPROVED: [Signature] DATE: 10/11/99



MEMORANDUM

*College of Education
Bureau of Evaluation, Research, & Service
414 Claxton Addition
Knoxville, Tennessee 37996-3400
(423) 974-2272
FAX (423) 974-8718*

TO: Vicki Sells-Lewallen
735 University Ave
Sevance, TN 37383

Dr. E. Dale Doak
307 Claxton Addition
Campus Mail

FROM: Dr. Ian Rocker 

SUBJECT: Approval of Form A Review - Use of Human Subjects in Research

DATE: January 25, 2000

The Committee has reviewed your Form A and has approved it for Compliance with Human Subject Research Guidelines for the Project: "Liberal Arts Faculty Concerns Toward Instructional Technology."

Attached is a copy of the approved Form A with the signed permission form. If you have any questions, please feel free to contact me at (423)974-4112.

IRte

Attachments

c: Ms. Brenda Lawson

J. CERTIFICATION: The research described herein is in compliance with 45 CFR 46.101(b) and presents subjects with no more than minimal risk as defined by applicable regulations.

Principal Investigator	<u>Vicki Sells-Lewallen</u>	<u><i>Vicki Sells-Lewallen</i></u>	<u>12/7/99</u>
	Name	Signature	Date
Student Advisor	<u>E. Dale Doak</u>	<u><i>E. Dale Doak</i></u>	<u>12/7/99</u>
	Name	Signature	Date
Dept. Review			
Comm. Chair	<u>John Ray</u>	<u><i>John Ray</i></u>	<u>12/9/99</u>
	Name	Signature	Date
APPROVED:			
Dept. Head	<u>M. Everett Myer</u>	<u><i>M. Everett Myer</i></u>	<u>12/7/99</u>
	Name	Signature	Date
College			
Approval	<u>Jan R.H. Rockett</u>	<u><i>Jan R.H. Rockett</i></u>	<u>1-25-00</u>
	Name		Date

APPENDIX 5

5-Item Raw Scale Score Total	Stage 0	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5	Stage 6	Total Raw Score	Percenti le
0	10	5	5	2	1	1	1		
1	23	12	12	5	1	2	2	1-42	3
2	29	12	12	5	1	2	2	43-55	6
3	37	19	17	9	2	3	5	56-60	9
4	46	23	21	11	2	4	6	61-66	12
5	53	27	25	15	3	5	9	68-72	15
6	60	30	28	18	3	7	11	73-74	18
7	66	34	31	23	4	9	14	75-78	21
8	72	37	35	27	5	10	17	79-80	24
9	77	40	39	30	5	12	20	81-83	27
10	81	43	41	34	7	14	22	84-86	30
11	84	45	45	39	8	16	26	87-89	33
12	86	48	48	43	9	19	30	90-92	36
13	89	51	52	47	11	22	34	93-95	39
14	91	54	55	52	13	25	18	96-98	42
15	93	57	57	56	16	28	42	99-101	45
16	94	60	59	60	19	31	47	102-104	48
17	95	63	63	65	21	36	52	105-107	51
18	96	66	67	69	24	40	57	108-110	54
19	97	69	70	73	27	44	60	111-112	57
20	98	72	72	77	30	48	65	113-114	60
21	98	75	76	80	33	52	69	115-118	63
22	99	80	78	83	38	55	73	119-122	66
23	99	84	80	85	43	59	77	123-125	69
24	99	88	83	88	48	64	81	126-127	71
25	99	90	85	90	54	68	84	128-132	74
26	99	91	87	92	59	72	87	133-136	77
27	99	93	89	94	63	76	90	137-141	80
28	99	95	91	95	66	80	92	142-144	83
29	99	96	92	97	71	84	94	145-150	86
30	99	97	94	97	76	88	96	151-156	89
31	99	98	95	98	82	91	97	157-161	92
32	99	99	96	98	86	93	98	162-173	95
33	99	99	96	99	90	95	99	174-189	98
34	99	99	97	99	92	97	99	191-245	99
35	99	99	99	99	96	98	99		

VITA

VITA

Vicki G. Sells-Lewallen was born in Burkesville, Kentucky on March 23, 1955. She attended public schools in Hobart, Kentucky and New Castle, Indiana, where she graduated from Walter P. Chrysler Memorial High School in 1972. She attended Antioch College in Yellow Springs, Ohio, receiving a Bachelor of Arts degree in History in 1978. Her Senior Thesis for the B.A. degree discussed the missionary influence in nineteenth-century China.

In 1988, she attended an education certification program at Western Kentucky University in Bowling Green, Kentucky. She began working at Alvin C. York Institute in Jamestown, Tennessee as an English teacher in 1989. She taught English to high school students at York Institute until 1992, when she became the Technology Coordinator at York Institute. In 1994, she received a Master of Science degree in Instructional Technology from the College of Education at the University of Tennessee in Knoxville.

In 1995, she began work on a Doctorate in Education in Instructional Technology at the University of Tennessee in Knoxville. She continued working as Technology Coordinator at Alvin C. York Institute until July of 1998. In August of 1998, she began work as the Director of the Instructional Technology Workshop at the University of the South in Sewanee, Tennessee where she is presently employed.