ATHLETIC TRAINING EDUCATION PROGRAM DIRECTORS' CONCERNS WITH THE INNOVATIONS OF INSTRUCTIONAL MEDIA AND INSTRUCTIONAL DESIGN

by

JEREMY ROSS SEARSON

ANGELA BENSON, COMMITTEE CHAIR
C. JOHN TARTER
MARGRET RICE
VIVAN WRIGHT
TONI TORRES-MCGEHEE

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ABSTRACT

The utilization of instructional technology in allied health based education programs has increased over the last century. However, limited research in athletic training education programs (ATEPs) examines the adoption of instructional technology. The purpose of this study was to identify concerns of program directors (PDs) with the constructs of instructional technology. Using the Concerns Based Adoption Model (CBAM) as a theoretical framework, this study employed a cross-sectional survey design based on the Stages of Concern (SoC) dimensions of the CBAM. A demographic survey and a Stages of Concern Questionnaire (SoCQ) for both constructs were completed by 57 PDs. The SoCQ identifies seven dimensions of concerns: unconcerned, informational, personal, management, consequences, collaboration, and refocusing. Group profile and quantitative analyses (MANOVAs, ANOVAs, and Chi Square) of the data were conducted.

Group profile analysis revealed PDs had high relative intensities on Stages 0-2 (low level concerns) with a tailing up (i.e., dramatic rise in relative intensity) of Stages 5 and 6 concerns for both constructs. Both SoC profiles had peak SoCs identified as Stage 0 (unconcerned). The instructional media profile displayed a secondary peak at Stage 1 (informational), while the instructional design presented two secondary peaks at Stage 3 (management) and Stage 1 (informational). The evaluation of the peak and secondary SoCs for both constructs uncovered a pattern of self-based concerns (Stages 0-2) for a majority of PDs. The overall SoC profile for both innovations was that of a non-user. Concerns with instructional media did not appear to be influenced by any variables in the study. Further results demonstrated age and tenure status

influenced PDs' concerns on Stage 0 when investigating instructional design. PDs that identified with the combined definition (tools and process) of instructional technology were found to be more likely located in low level concerns (Stages 0-2) when investigating with the innovation of instructional design.

The findings of this study can (a) guide future research into the concerns of PDs as they relate to the adoption and diffusion of instructional technology and (b) direct change facilitators involved with ATEPs to address barriers to the adoption and diffusion of instructional technology.

DEDICATION

This dissertation is dedicated to more people than can ever be listed on a single page. I dedicate it first to my family who through it all has supported this venture and period of my life. My friends from all walks of life, you have been there every step of the way, the highs the lows, and for that I can never repay you. Finally, I dedicate this to Carter, long nights sleeping in my lap as I worked or playing fetch over piles of various drafts, articles and books; you truly are a man's best friend. I thank you all for your love, encouragement, support, and above all patience throughout this journey.

ABBREVIATIONS

a	Cronbach's index of internal consistency
df	Degrees of freedom: number of values free to vary after certain restrictions have been placed on the data
F	Fisher's *F* ratio: A ration of two variances
M	Mean: the sum of a set of measurements divided by the number of measurements in the set
p	Probability associated with the occurrence under the null hypothesis of a value as extreme as or more extreme than the observed value
r	Pearson product-moment correlation
t	Computed value of *t* test
<	Less than
=	Equal to
AMA	American Medical Association
ATC	Certified Athletic Trainer
ANOVA	Analysis of variance
ATEPs	Athletic Training Education Programs
CAATE	Committee for Accreditation of Athletic Training Education Programs
CAAHEP	Commission on the Accreditation of Allied Health Educational Programs
CAHEA	Committee on Allied Health Education and Accreditation
CBAM	Concerns Based Adoption Model

CHEA	Council on Higher Education Accreditation
JRC-AT	Joint Review Committee on Educational Programs in Athletic Training
NATA	National Athletic Trainers' Association
PINs	Personal identification numbers
SEDL	Southwest Educational Development Laboratory
SoC	Stages of Concern
SoCQ	Stages of Concern Questionnaire
WWII	World War II

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CHAPTER 1

INTRODUCTION

The past 70 years have demonstrated tremendous change in the fundamentals of Athletic Training Education Programs (ATEPs). The advances in education parallel the accomplishments of the profession, including the acknowledgment of the American Medical Association (AMA). The acknowledgement of athletic training as an allied health profession laid the groundwork for accreditation of athletic training programs. This recognition, along with the introduction of the curriculum model in 1956 (Delforge & Behnke, 1999), helped promote the transformation of the educational component of athletic training. The curriculum model was designed to enhance the level of "professionalism in athletic training" (Delforge & Behnke, 1999, p. 53). First introduced by the National Athletic Trainers' Association (NATA), the model provided the first formal regulation for educational competencies for athletic trainers. Programs continued to transform as they moved from a non-regulated internship route to programs accredited by the Committee for Accreditation of Athletic Training Education (CAATE), a self-regulating entity. CAATE then served as the guide for ensuring educational competencies were in line with professional objectives and minimum skills required by the field.

Similarly, the use of instructional technology has changed significantly over the past century. Higher education has utilized instructional technology to meet the requirements of institutions, faculty, students, and directives from a variety of accrediting bodies. In a similar fashion to other accrediting agencies, CAATE has designed competencies to address the ever-changing face of the profession as technology is integrated into the field of athletic training.

Limited research has been conducted on the utilization of instructional technology in ATEPs (e.g., Fincher & Wright, 1996; Wiksten, Patterson, Antonio, De La Cruz, & Burton, 1998; Wilksten, Spagnjer, & LaMaster, 2002). The most recent study by Fincher and Wright (1996) focused on the use of computer-based instruction and faculty utilization of media based technology in ATEPs. While research in ATEPs is limited, studies across other allied health fields have investigated the use of instructional technology, including multimedia modules (Freidl et al., 2006), the integration of instructional technology (Zayim, Yildirim, & Saka, 2006), and the effectiveness of web-enhanced learning (Mitchell, Ryan, Carson, & McCann, 2007). Positive results from these studies demonstrate the potential for the integration of instructional technology within ATEPs.

The use of instructional technology has been debated in education for years. Earlier researchers used a myopic view of instructional technology that encompassed computers, videos, CD-ROMs, overhead and slide projectors and common tools associated with the field. Reiser (2001) distinguished two specific aspects of instructional technology: (a) instructional media, "the physical means via which instruction is presented to the learners" (p. 18) and (b) instructional design, "analysis of instructional problems, and the design, development, implementation and evaluation of instructional procedures and materials intended to solve those problems" (p. 58). Delineating the definition of instructional technology gives researchers a richer understanding of the underlying factors being evaluated. Studies conducted in ATEPs and allied health professions have been limited in number and focused on the media component of instructional technology (Fincher & Wright, 1996; Freidl et al., 2006; Mitchell et al., 2007; Zayim et al., 2006). This concentration on instructional media has omitted the instructional design component and captured only a fragment of the instructional technology process. Future studies on instructional technology utilization, referred to as adoption and diffusion, in ATEPs and other allied health fields should encompass both components.

The adoption process of individuals affects the overall diffusion of instructional technology across a field. Several models have been created to explain the adoption and diffusion process, including Rogers' Theory of Innovation Diffusion (1962), Hall's Concerns Bases Adoption Model (1977), and Davis' Technology Acceptance Model (1989). Straub (2009) examined the similarities between adoption and diffusion models and pointed to three characteristics that influence the adoption process: individual characteristics, innovation characteristics, and contextual characteristics. Researchers can investigate trends in adoption using these models to understand individual concerns and develop professional development schemas to promote diffusion throughout a field.

The Concerns-Based Adoption Model (CBAM) is described by George, Hall, and Stiegelbauer (2006) as being "a conceptual framework that describes, explains, and predicts probable behaviors throughout the change process" (p. 5). It is intended to navigate change facilitators through the adoption process by identifying the concerns of adopters. The CBAM was chosen as the framework of this study. This model, which determines "group and individual needs during [innovation] adoption process" (Hall & Louckus, 1978, p. 36), was selected based on its design for use in the educational setting. It is composed of three dimensions: the Stage of Concern (SoC), Level of Use (LoU), and Innovation Configuration (IC). For this study, only the SoC was used to evaluate the personal side of change for PDs with the innovations of instructional media and instructional design. The SoC has four basic areas of concerns: (a) Impact (Stages 4-6) – focus is on the affect the innovation has and how to increase outcomes, (b) Task (Stage 3) – focus is on management of the innovation (e.g. time, logistics, and scheduling),

(c) Self (Stages 1&2) – focus is on personal feelings and impact of innovation on the adopter, and (d) Unconcerned (Stage 0) – adopters are focused on other concerns than those of the innovation. The objective in understanding the SoC profile is to develop a holistic perspective of the concerns of the individual. Evaluating the peak and secondary peak SoC can provide change facilitators with insights to PDs' concerns and their position in the adoption process (George, Hall, Stiegelbauer, 2006).

Statement of the Problem

Research in the field of athletic training education lacks a current analysis of the adoption of instructional technology by ATEPs. Specifically, it warrants an investigation of the concerns PDs face with the adoption process. Current research also fails to account for the field as a whole by evaluating both components of instructional technology: instructional media and instructional design. Current research has not provided the depth and breadth necessary to provide an accurate picture of current concerns of ATEPs' PDs. Fincher and Wright's (1995) research represents the most recent published study examining ATEPs' faculty use of instructional media, defined by the researchers as instructional technology. It represents a myopic view of instructional technology by excluding the instructional design components and, thus, does not provide an accurate description of the climate of ATEPs today. Previous studies, similar to Fincher and Wright's have relied heavily on survey instruments that lack the specificity necessary to evaluate the field of instructional technology as a whole (Ajjan & Hartshorne, 2008; Casey & Rakes, 2002; Freeman, 1987; Kagima & Hausafus, 2000; Moser, 2007).

Purpose of the Study

As the field of athletic training continues to grow and evolve, there is a need for self-assessment of the effectiveness of current pedagogical practices. Research on the concerns of

PDs in ATEPs related to instructional technology can help change facilitators, CAATE and individual institutions develop initiatives to increase the utilization of instructional technology in the educational process. The purpose of this study was to determine PDs' of CAATE accredited ATEPs peak and second highest SoCs with the innovation of instructional technology and the variables that influence them.

Research Questions

The following research questions (RQs) guided this study:

RQ #1. What is the peak SoC for PDs of ATEPs with the innovation of instructional media?

RQ #2. What is the second highest SoC for PDs of ATEPs with the innovation of instructional media?

RQ #3. Are there significant differences between the (a) personal demographics, (b) academic demographics, and (c) innovation characteristics and the SoCs of PDs in ATEPs with the innovation of instructional media?

RQ #4. What is the relationship between (a) personal demographics, (b) academic demographics, and (c) innovation characteristics and the SoCs of PDs in ATEPs with the innovation of instructional media?

RQ #5. What is the peak SoC for PDs of ATEPs with the innovation of instructional design?

RQ #6. What is the second highest SoC for PDs of ATEPs with the innovation of instructional design?

RQ #7. Are there significant differences between the (a) personal demographics, (b) academic demographics, and (c) innovation characteristics, and the SoCs of PDs in ATEPs with the innovation of instructional design?

RQ #8. What is the relationship between (a) personal demographics, (b) academic demographics, and (c) innovation characteristics, and the SoCs of PDs in ATEPs with the innovation of instructional design?

RQ #9. Is there a significant difference between the peak scores of the individual components of instructional technology, the innovations of instructional media or instructional design, as identified by PDs of ATEPs?

Method

The study employed a cross-sectional survey design. The population consisted of PDs in CAATE accredited entry- and graduate-level ATEPs. The sampling plan included all 367 program directors at institutions housing an ATEP. The researcher employed the SoCQ (Hall, George, & Rutherford, 1977) to obtain the level of concern of PDs as it relates to the innovations of instructional media and instructional design. The SoCQ is a 35-question instrument consisting of 8-point Likert scale items. The SoCQ provides researchers with individual and group composite views of the stages of concerns held by the participants being studied. The peak score and secondary score were selected as the independent variables under investigation. The SoCQ was administered twice, once for each component of instructional technology. In addition, data were collected on the participants' demographic, academic, and innovation-related characteristics. Research questions 1, 2, 5, and 6 were analyzed using descriptive statistics. Research questions 3 and 7 were analyzed for statistical significance using descriptive statistics, MANOVAs, and ANOVAs. Research questions 4 and 8 were analyzed for significant relationships using a forward stepwise regression. Research question 9 was analyzed using descriptive statistics and an independent *t*-test for significance.

Null Hypotheses

(RQ #3) HO1. There is no significant difference in peak SoC for (a) personal demographics, (b) academic demographics, and (c) innovation characteristics and the SoCs of PDs.

(RQ #4) HO2. No contributions to a linear composite will be significantly related to the SoCs of PDs in ATEPs with the innovation of instructional media in terms of (a) personal demographics, (b) academic demographics, and (c) innovation characteristics.

(RQ #7) HO3. There is no significant difference in peak SoC for (a) personal demographics, (b) academic demographics, and (c) innovation characteristics and the SoCs of PDs.

(RQ #8) HO4. No contributions to a linear composite will significantly relate to the SoCs of PDs in ATEPs with the innovation of instructional design in terms of (a) personal demographics, (b) academic demographics, and (c) innovation characteristics.

(RQ #9) HO5. There is no significant difference in the peak score for the innovation of instructional media and the peak score for the innovation of instructional design for PDs.

Significance

This project will be highly significant for CAATE and higher education administrators involved in the development and support of ATEPs. Effective integration of instructional technology begins with understanding the concerns of faculty members facing the adoption process. The outcomes of this study will provide change facilitators in ATEPs with a vehicle to understand faculty concerns with the utilization of instructional technology (Hall et al., 1977).

The results can then be used to design and implement policy changes not only at the level of CAATE but also at individual institutions housing ATEPs.

Limitations of the Study

The researcher recognized the following limitations of the present study:

1. This study is limited to self-reporting and assumes subjects will respond truthfully.

2. The cross-sectional design of study limits the views of the respondents to a specific time and does not accurately represent the views of the participants over a continuum.

3. This study is limited to the concerns of faculty as measured by the SoC Questionnaire. The SoCQ is not designed to provide respondents the opportunity to respond with additional information to the survey instrument.

4. The study design also limits itself based on the utilization of two SoC Questionnaires. The similarities between the two may have led to early termination of the survey by participants.

Definition of Terms

The following section defines terminology used in the current study:

Allied Health Care Professional. An individual that holds both state and national credentials in a field that has direct application to the field of athletic training (e.g., chiropractor, dentist, registered dietician, nurse practitioner, physical therapist; CAATE, 2008).

Athletic Training Education Program (ATEP). Certified Athletic Trainers must graduate from a CAATE accredited program that consists of formal instruction in areas such as injury/illness prevention, first aid and emergency care, assessment of injury/illness, human anatomy and physiology, therapeutic modalities, and nutrition (CAATE, 2008).

ATEP Faculty. "BOC Certified Athletic Trainers and other faculty who are responsible for classroom or sponsoring institution clinical instruction in the athletic training major" (CAATE, 2008, p. 16).

Certified Athletic Trainer. A certified athletic trainer is a certified allied health care professional that is an integral member of a health team. The athletic trainers work in conjunction with other allied health care providers to development and coordinate efficient and responsive health care delivery systems.

Commission on Accreditation of Athletic Training Education (CAATE). CAATE is an accrediting body responsible for developing, maintaining, and promoting the standards for ATEPS. The organization is recognized by a number of professional organizations including the American Academy of Family Physicians, the American Academy of Pediatrics, the American Orthopedic Society for Sports Medicine, and the National Athletic Trainers' Association (NATA; CAATE, 2008).

Instructional technology. Instructional technology is "[a] field concerned with the design, development, utilization, management, and evaluation of processes and resources for learning" (Luppicini, 2005, p. 108)

Instructional media. Instructional media is "the physical means via which instruction is presented to the learners" (Reiser, 2001, p. 18).

Instructional design. Instructional design is the "analysis of instructional problems, and the design, development, implementation and evaluation of instructional procedures and materials intended to solve those problems" (Reiser, 2001, p. 58).

Program director. "The full-time faculty member of the host institution and a BOC Certified Athletic Trainer responsible for the administration and implementation of the ATEP" (CAATE, 2008, p.19).

CHAPTER 2

LITERATURE REVIEW

This review of the literature opens with an overview of the history of the field of athletic training and the evolution of ATEPs, followed by a discussion of instructional technology in ATEPs. This chapter also presents current research related to the facilitators and barriers involved with the adoption of instructional technology by faculty in higher education. Further, an evaluation of prominent adoption and diffusion models is presented. The chapter concludes with a description of the Concerns Based Adoption Model (CBAM) and its use as diagnostic tool to evaluate individual concerns about an innovation.

Athletic Training Education

The profession of athletic training and its associated educational pedagogy has undergone a period of tremendous change over the last 70 years (Delforge & Behnke, 1999). Through an extensive process of vetting educational programs, athletic training has developed two educational tracks for future athletic trainers: an undergraduate level track and a graduate level track. The National Athletic Trainers' Association (NATA), the professional association for certified athletic trainers, serves as the driving force behind the momentum and direction of the academic movement.

In 1956, the NATA board of directors introduced the curriculum model as a mechanism to enhance professionalization across the entire field of athletic training (Delforge & Behnke, 1999). Delforge and Behnke pointed to two key components in the first curriculum design model that set the groundwork for ATEPs: (a) an emphasis on the attainment of a secondary-level teaching certificate and (b) parallel requirements for acceptance into physical therapy schools. These curriculum components represented an attempt to increase the employability of individuals graduating from ATEPs by catering to other professional fields. The NATA wanted to develop a specialized degree path for athletic training; however, it fell short and many institutions simply incorporated the proposed coursework into existing paramedical curriculums. This trend kept athletic training from developing the “specialized, common body of knowledge” (Delforge & Behnke, 1999, p. 54) that would reinforce the profession. The result was the need to separate ATEPs from pre-existing paramedical fields and develop a unique course of study to meet the needs of the NATA and the growing profession. Initial calls for the implementation of curriculum-based programs were not addressed by institutions for nearly 10 years (Delforge & Behnke, 1999). In 1969, Manaketo State University, Indiana State University, Lamar University, and The University of New Mexico became the first ATEPs to be officially recognized by the NATA.

A subsequent major change in the profession began in 1970 when the NATA developed and implemented its first certification examination. The certification examination was utilized to further legitimize the field and standardize the practice of athletic training across the field. At the time of conception, individuals had to complete one of four routes in order to qualify for the exam: graduation from an NATA-approved ATEP, completion of an apprenticeship program, graduation from a school of physical therapy, or a special consideration route. The utilization of the certification examination and subsequent creation of the academic curriculum improved the professionalization of athletic training and, more importantly, led to the public recognition of the profession by the American Medical Association (AMA; Delforge & Behnke, 1999).

A rapid expansion of the number of undergraduate ATEPs occurred throughout the 1970s, increasing from four programs in 1969 to 62 in 1982 (Delforge & Behnke, 1999). Similarly, the number of graduate programs increased from 2 to 9 in that same period (Delforge & Behnke, 1999). The rapid growth coupled with the diversifying of the profession led to a shift in the curriculum model. The NATA looked to develop a specialized knowledge base for the profession, subsequently separating itself from the curriculums of physical therapy and teacher education. These two cornerstones of the original model were removed from the curriculum and replaced with required clinical experiences and a defined list of behavioral objectives unique to the field. This led to the creation of a unique body of knowledge specific to the field of athletic training, further legitimizing the profession (Delforge & Behnke, 1999).

Following the creation of a specialized body of knowledge for the field, the NATA established an academic major in athletic training. Proposed in the early 1980s, the idea did not actually materialize until 1986 (Delforge & Behnke, 1999). The implementation date was delayed several times to allow institutions to incorporate the guidelines into already existing programs. The guidelines were published in 1983 and referred to as *Guidelines for Development and Implementation of NATA Approved Undergraduate Athletic Training Programs* (NATA, 1983). The change from a specialization or concentration to a major represented a fundamental change in thought by the NATA. The new guidelines also affected the way programs were organized. Curriculums required courses be based on subject matter, not specified courses. This change allowed institutional flexibility with course sequencing and development. Secondly, specific competencies were introduced replacing the behavioral objectives. These competencies further defined the specificity of the field and provided further legitimacy to the profession.

Following changes to the curriculum, athletic training turned to the AMA for recognition as an allied health profession. In June of 1990, athletic training formally began to receive recognition. The NATA enlisted the AMA to accredit educational programs utilizing the Committee on Allied Health Education and Accreditation (CAHEA; Delforge & Behnke 1999; Prentice, 2010). According to Delforge and Behnke, the NATA's rationale behind the decision was that the benefits of having a specialized accreditation agency peer review the curriculum provided more validity to the profession. CAHEA and the NATA then worked together to develop a review committee that would oversee ATEPs. They created the initial accrediting body for ATEPs, the Joint Review Committee on Educational Programs in Athletic Training (JRC-AT). In 1994, the first programs began to receive accreditation through the new process monitored by the JRC-AT. The AMA disbanded its accrediting arm and became a co-sponsor of the new accrediting body, the Commission on the Accreditation of Allied Health Educational Programs (CAAHEP). The changes during the 1990s provided further reorganization of the profession as well as legitimacy to the educational process (Delforge & Behnke, 1999; Prentice, 2011).

In 2003, the JRC-AT concluded that CAAHEP was no longer able to meet the requirements of the profession. The group moved from the umbrella of CAAHEP and became an independent accrediting agency, similar to other allied health professions. In 2006, the JRC-AT officially became known as the Committee for Accreditation of Athletic Training Education (CAATE). CAATE was officially recognized in 2007 by the Council on Higher Education Accreditation (CHEA). Prentice (2011) acknowledged that CHEA recognition was a positive step, not only in athletic training education, but in the future "regulatory legislation, the practice of athletic training in nontraditional settings, and insurance considerations" (p. 28). CAATE was now charged with the task of developing, disseminating, and monitoring the specialized field of knowledge developed by NATA.

Recognition by prominent organizations, such as the AMA, development of a specialized field of knowledge, and accrediting of the ATEPs by CAATE helped solidify athletic training as an allied health profession. The development of a specialized field of knowledge and specific competencies has laid the groundwork for ATEPs. This historical account is further summarized in Table 1 and provides a foundation upon which a review of literature for instructional technology in ATEPs will be explored.

Instructional Technology and ATEPs

Instructional technology is defined as having two components: instructional media and instructional design (Commission on Instructional Technology, 1970; Luppicini, 2005; Reiser, 2001). The Commission on Instructional Technology (CIT) defined instructional media as "…the media born of the communications revolution which can be used for instructional purposes alongside the teacher, textbook, and blackboard…" (CIT, p. 19). Instructional design was described to be "…a systematic way of designing, carrying out, and evaluating the total process of learning and teaching in terms of specific objectives, based on research in human learning and communications, and employing a combination of human and nonhuman resources to bring about more effective instructions" (CIT, p. 19).

This research adopts the two-construct definition of instructional technology and allows the researcher to consider all aspects of instructional technology use in ATEPs including the tools (hardware and software, more commonly known as instructional media) and the processes (application of technology and instructional techniques, more commonly known as instructional design) associated with instructional technology. Previous studies examining the utilization of instructional technology have focused on the instructional media component (Fincher & Wright, 1996).

Table 1
The History of Athletic Training Education

Year	Event
1955	NATA Committee on Gaining Recognition appointed
1959	First athletic training curriculum model approved by NATA
1969	NATA Professional Educational Committee (PEC) and NATA certification Committee developed (former subcommittees of Committee on Gaining Recognition. First undergraduate athletic training curriculums approved by NATA)
1970	First national certification examination administered by the NATA Certification Exam
1972	First graduate athletic training curriculum approved by the NATA
1980	NATA resolution requiring athletic training curriculum major, or equivalent, approved by NATA Board of Directors
1990	Athletic training recognized as allied health profession by American Medical Association (AMA). Joint Review Committee on Educational Programs in Athletic Training (JRC-AT) Formed
1991	Essentials and guidelines for an Accredited Educational Program for Athletic Trainer approved by the AMA Council on Medical Education
1994	First entry-level athletic training educational programs accredited by AMA Committee on Allied Health Education and Accreditation (CAHEA). Commission on Accreditation of Allied Health Education Programs (CAAHEP) formed (replaced CAHEA as entry-level athletic training education program accreditation agency). NATA Task Force appointed
1996	NATA Education Task Force recommendations approved by NATA Board of Directors NATA Education Council Formed
2003	JRC-AT decides that CAAHEP was unable to meet requirements of the profession and moves to a self-accrediting agency
2006	JRC-AT becomes officially known as Committee for accreditation of Athletic Training education (CAATE)
2007	CAATE receives official recognition from the Council on Higher Accreditation

Instructional Technology in ATEP Competencies

The fourth edition of the Athletic Training Educational Competencies (NATA, 2006) was developed as a guide for ATEPs. The competencies offered specificity for the field and served as a road map to ATEPs in developing individual curriculum. The Athletic Training Educational Competencies have two specific competencies related to technology:

> PD-C11 - Identify and access available educational materials and programs in health-related subject matter areas (audiovisual aids, pamphlets, newsletters, computers, software, workshops, and seminars) and
>
> AD-C9 - Identify and describe technological needs of an effective athletic training service and the commercial software and hardware that are available to meet these needs (National Athletic Trainers Association, 2006)

The NATA's identification of these competencies points to the importance of technology in the field of athletic training. These competencies represent crucial components of the academic process for CAATE accredited programs. As a result of these competencies, academic units have experienced increased utilization and demand for use of technologies, not only in the field, but also in the classroom. Further, host institutions of ATEPs developed educational guidelines and policies that promoted the use of instructional technology.

Very few researchers have investigated the use of instructional technology in ATEPs (Fincher & Wright, 1996). Neither existing research, competencies provided by the NATA, or standards of CAATE have addressed both components of instructional technology. Further, research has not examined faculty adoption or diffusion of instructional media or instructional design in ATEPs, which is important in the development of ATEP interventions to enhance technology deficiencies.

Faculty Adoption and Utilization of Instructional Technology

The growth of athletic training as a profession has paralleled that of other allied health professions including nursing, physical therapy, and occupational therapy. Modifications to accreditation requirements led to new initiatives developed by host institutions to maintain ATEPs and meet agency guidelines. Changing student populations have also pressured allied health professions and their educational components to evaluate, develop, and implement a variety of instructional technologies (Kala, Isaramalai, & Pohtong, 2010; Medley & Horne, 2005; Mitchell et al., 2007). Medical schools have also seen an increase in the utilization of instructional technology by faculty at the graduate level (Freidl et al., 2006; Zayim et al., 2006). With continued demand the trend towards the incorporation of instructional technology in allied health professions will continue to expand. ATEPs are experiencing similar pressures as accrediting agencies and host institutions push towards the integration of technology into educational units.

Utilization of instructional technology in allied health professions. Several studies have focused on the utilization of instructional technology in allied health professions. For example, Friedl et al. (2006) examined the effectiveness of multimedia modules versus traditional mediums when preparing students for aortic valve replacement surgeries. The study consisted of 126 randomly selected students to be in the multimedia group or the traditional paper based group. The outcomes of the study demonstrated no statistical difference between the groups when observing factual knowledge. However, it was discovered that the multimedia group required less study time when compared to their traditional paper based counterparts. The study also found no significant differences in motivation, computer literacy, or quality of the instructional medium across the two student groups.

Technology integration into instruction by medical faculty was the purpose of research completed by Zayim et al., (2006). They focused on differences between faculty members and associated technology utilization rates. The group found significant differences in the adoption rates of early adopters and mainstream faculty members. Further, the study revealed that the individual characteristics of adoption patterns, barriers to adoption, and learning preferences were also statistically significant in terms of utilization rates. High self-efficacy in computer use was also significantly more likely to be displayed in early adopters (Zayim et al., 2006).

Mitchell et al. (2007) studied the effectiveness of web-enhanced learning in undergraduate nursing students. The group studied the usage trends of students completing an undergraduate level course using WebCT. The group completed three phases in the study: focus group, questionnaire, and utilization trends on WebCT. In the first portion of the study, the focus groups revealed several trends among the students, including financial cost and insufficient skills and training, as barriers to utilization (Mitchell et al., 2007). In the questionnaire phase, 98.9% ($n = 231$) of the participants recommended the continued use of the hybrid web-enhanced modules (Mitchell et al., 2007). An analysis of the tracking numbers revealed significant differences in the mean marks of students utilizing WebCT versus those who did not. Mitchell et al. suggested that students who actively engaged with WebCT were more likely to receive higher marks in evaluations associated with the course.

Utilization of instructional technology in ATEPs. Fincher and Wright's (1996) research explored the utilization of computer-based instruction in graduate and undergraduate ATEPs. The researchers developed and used a 26-item survey to assess the level of technology use in athletic training education. The survey was designed to address four major areas: status of computer-based instruction use, software and instructional methods used, attitudes towards computer-based instruction, and demographics relative to employed position and personal computer use. The survey was distributed to PDs of 84 undergraduate and 13 post-certification ATEPs, with an 88.6% survey completion rate (Fincher & Wright, 1996). From the survey results, the researchers examined the extent to which technology was being utilized by the PDs. They found that 55.8% of the PDs reported some form of computer-based instruction in their educational programs. Of those respondents, 54.7% reported utilization of computer-assisted instruction while only 10.6% reported the utilization of interactive video (Fincher & Wright, 1996). The data revealed that only 10.0% of graduate programs utilized computer-based instruction in comparison to 60.5% at the undergraduate level (Fincher & Wright, 1996). The researchers attributed these findings to the relative infancy of technology in ATEPs and the fact that only 16.7% of groups reported utilization of over 5 years. These percentages demonstrate that utilization of "computer-based instruction is similar to that reported by other allied health professions" (Fincher & Wright, 1996, p. 47).

In addition to looking at the application of technology in ATEP, Fincher and Wright (1996) also investigated the factors that acted as barriers to adoption among faculty. They identified 38 respondents who did not utilize computer-based instruction and asked them to identify the primary factor that best described why they did not utilize technology. The respondents provided several responses, including (a) lack of funds (63.2%), (b) never thought of utilization of technology (23.7%), and (c) a lack of research demonstrating the benefits of computer-based instruction (5.3%; Fincher & Wright, 1996). The researchers indicated that even though athletic training is a relatively new to the field of education, it is utilizing instructional technology on a level similar to those of other professions in the allied health field. Fincher & Wright cited Freeman (1987) as demonstrating that 43% of allied health programs utilized computer-assisted instruction in comparison to 54.7% in ATEPs. The researchers also pointed to similar barriers to adoptions across other allied health fields, including budget constraints, unfamiliarity, and unproven success.

Fincher and Wright (1996) represent the most recently published investigation of instructors' utilization and acceptance of instructional technology in the academic realm. While important, this original research was completed more than 15 years ago and does not reflect the current state of the field. Their research categorized the field as relatively young, pointing towards a diffusion of instructional technology over time. Additionally, Fincher and Wright's research addressed only the instructional media, or tools, component of instructional technology, thus limiting the scope of the study. Their study indicates that additional research should further investigate both components as well as address factors that facilitate or provide barriers to the adoption of instructional technology in ATEPs.

Influences on faculty adoption rates of instructional technology. As summarized in Table 2.3, researchers have studied the factors that influence adoption rates of faculty members. Hiltey et al. (2006) noted that for successful integration of technology to occur there must be opportunity and instructors must recognize the opportunity and ultimately be motivated to capitalize on it. Surry (2000) indicated that individual viewpoints directly impact the utilization of technology. His research revealed a high level of individualism in the adoption of technology. It counters Perkins' (1985) "fingertip effect" by asserting that just because technology is available does not necessarily indicate it will be utilized. Further expounding upon this notion, Hilty et al. (2006) concluded that for instructional technology to be adopted there has to be a willingness to change, collaboration between all parties, and leadership to drive the process. The biggest factor in the adoption process is the individual and failure to recognize that can lead to decreased rates of diffusion across a population (Hitley et al., 2006; Surry, 2000).

Research shows that the utilization of instructional technology is a byproduct of an instructor's personal beliefs on the usefulness of a given medium. Clark (1993) demonstrated faculty were supportive of the utilization of instructional technologies but were unwilling to personally utilize it. In similar research, Inman, Kerwin and Mayes (1999) showed that instructors familiar with a technology were more likely to look favorably on it than those unfamiliar with it. Ertmer (2005) also found that the decision to adopt and use technology rested solely on the beliefs of the instructor. Similarly, Walczuch, Lemmicnk, and Streukens (2007) found that personalities of adopters made a difference in the utilization of instructional technologies. Phillips (2005) further noted a correlation between individual beliefs and low-uptake rate of educational technologies. In another study, Hilty et al. (2006) examined physicians' responses to the utilization of technology in education and found personal styles, attitudes, and familiarity as contributors to the decision-making process. This research showed that understanding the individual adopter can help provide a better understanding of the overall diffusion of an innovation, in this case instructional technology.

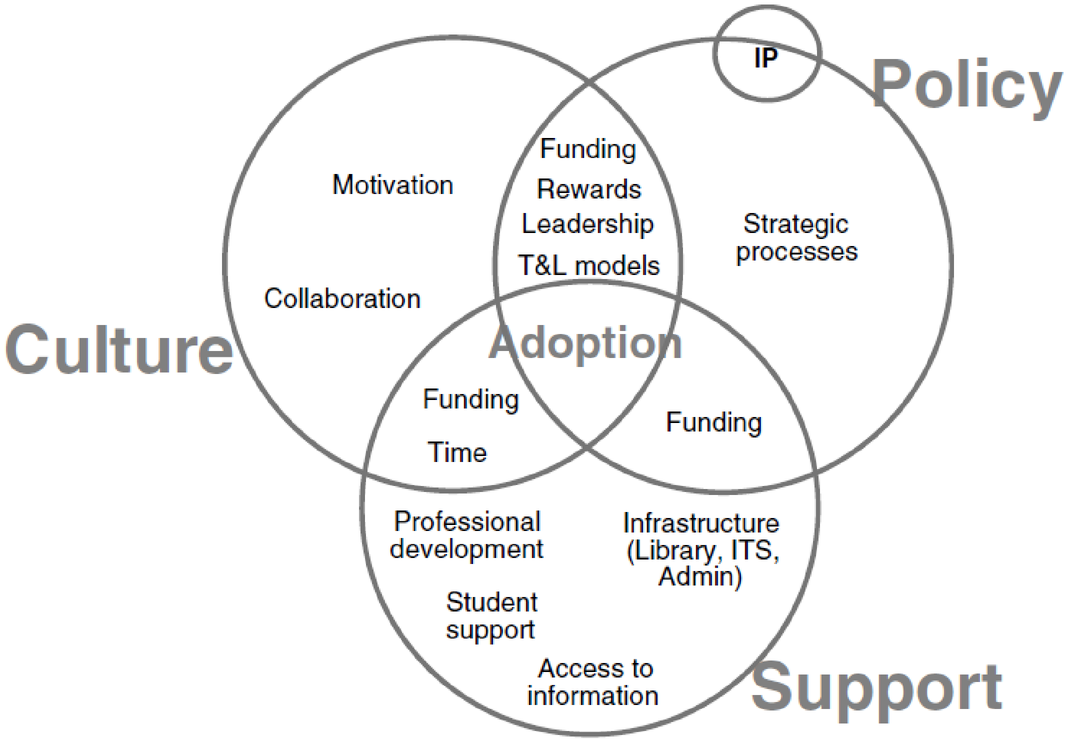
Zhao and Cziko (2001) evaluated the adoption rate of technology by instructors. They found that the uptake of technology was lagging behind the evidence supporting the benefits of technology and the financing being implemented by educational institutions to support it. Similar to other researchers (e.g., Anderson, 1997; Bitner & Bitner, 2002; Falvo, 2003; Howland & Wedman, 2004; Jaber & Moore, 1999; Koehler, Mishra, Hershey, & Peruski, 2004; McNaught, Phillips, Rossiter, & Winn, 2000; Sandholtz, 2001; Schrumm, Skelle, & Grant, 2003; Sahin & Thompson, 2007; Steel & Hudson, 2001; Zayim et al., 2006). Zhao and Cziko (2001) offered three specific conditions that had to be present for instructors to utilize the technology: (a) instructors must believe that the technology can help pursue a higher order goal while maintaining continuity in the course; (b) instructors must believe that they are competent and supported enough to implement the technologies; and (c) instructors need to feel that they will have sufficient funds and resources to implement the use of the technology.

In addition to instructor attitudes, the importance of institutional support has been demonstrated by several research groups. Respondents to research completed by Hiltz, Kim and Shea (2007) identified a number of factors affecting adoption rates, including support, leadership, research, and training and development. Ertmer (2005) also found that classrooms where instructors had access to computers and time to prepare produced a higher rate of successful implementation than their counterparts. Additionally, Inman, Kerwin, and Mayes (1999) noted that for instructional technology to be utilized effectively, administrators should provide instructors with the time, tools, and training necessary to implement new ideas. Dikx, Kielbaso and Smith (2004) also demonstrated that major deterrents to utilization included lack of devoted time or institutional space to implement new ideas.

Course material and subject matter can also affect the implementation of technology by faculty. Dikx et al. (2004) and Peluchette and Rust (2005) both conducted research that demonstrated that faculty deployed instructional technology based on course subject and type of information being introduced. Course size also influenced adoption rates. Peluchette and Rust (2005) found that courses with large cohorts were more likely to use visual instructional technologies. The group demonstrated that the utilization of communication media increased student interaction in these courses.

McNaught et al. (2000) evaluated institutional issues influencing faculty adoption rates. Three distinct domains that can influence faculty adoption were evident in their research: policy, culture, and support (see Figure 1). Phillips (2005) described policy as institutional leadership and policies towards instructional technology. The culture domain encompassed the “extent of collaboration within the institution, the personal motivation for innovators, as well as characteristics of the institution such as staff rewards, teaching, and learning models and attitudes towards innovation" (Phillips, 2005, p. 546). The final area, support, was inclusive of "institutional infrastructure designed to assist and facilitate the adoption process such as library and information technology service, professional development, of staff, student support, educational design support, and IT literacy support" (Phillips, 2005, p. 546). McNaught et al. (2000) designed the Venn diagram in Figure 1 to illustrate these three domains, or factors, affecting the adoption of technology. The group attributed the relationship of policy and support to forming the "glue" component of the process (McNaught et al., 2000, p. 139), an area that can impede the adoption process if not successfully supported.

Facilitators and barriers to adoption. Facilitators and barriers to faculty adoption of instructional technologies have been studied by a number of researchers. Bai and Ertmer (2008) examined what types of barriers inhibited the adoption of instructional technology and identified first and second order barriers. The first order barriers pertained to the "lack of access to hardware and software, time, and necessary support" (Bai & Ertmer, 2008, p. 94). Second order barriers were more intrinsic values that faculty specifically held. These included "teachers' belief systems about teaching and learning, as well as their familiar teaching practices, which can affect meaningful technology integration" (Bai & Ertmer, 2008, p. 94). Bai and Ertmer concluded that second order barriers were more difficult to overcome and oftentimes were the more limiting factors in faculty adoption of technology. There are numerous examples in the research of barriers and facilitators for the adoption of instructional technology (e.g., Bitner & Bitner, 2002; Cardenas, 1998; Howland & Wedman, 2004; Koehler et al., 2004; Schrumm et al., 2003).



IP = Intellectual Property; ITS =Information Technology Services; T&L = Teaching and Learning

Figure 1. Three element technology adoption model (McNaught et al., 2000, p. 139).

Training for instructional technology. Lack of training opportunities have been identified by a number of researchers as a barrier to adoption (Bitner & Bitner, 2002; Howland & Wedman, 2004; Kohler et al., 2004). Bitner and Bitner (2002) reinforced this idea by pointing to a systemic need to provide instructors with basic knowledge of instructional technology. Howland and Wedman (2004) confirmed that there was an increase in utilization and understanding of instructional technology following a training session. Research completed by Jaber and Moore revealed that teachers pointed to their peers (86%) or self-discovery (80%) as the most common means to gain experience with instructional technology. However, they and Schrumm et al. (2003) attributed these findings to the need for continuous and specifically designed training to better address the needs of instructors.

Available time for instructional technology development. Another barrier to the adoption of instructional technology was time. Subjects pointed to the lack of sufficient release time to work with instructional technology initiatives as a barrier to adoption. Koehler et al. (2004) found a need for a minimum of 10 hours a week of commitment to instructional technology for instructors to be successful. In similar research, Sahin and Thompson (2007) found that a lack of time for utilization of instructional technology reflected negatively on adoption rates.

Faculty motivation. Faculty members' motivation can serve as a facilitator to adoption. The faculty member needs to believe in a specific technology and believe it will benefit the student as well (Bai & Ertmer, 2008). They must have a perceived level of comfort with the technology and recognize it as a tool that can be beneficial (Dusick, 1998; Peluchette & Rust, 2005; Reznich, 1997). Bai and Ermter discussed the importance of attitude in faculty decisions towards technology. The researchers conclude that attitudes, which are predictors of behaviors, can be utilized to predict a faculty member's decision to implement or not implement technology. Faculty attitudes are often formed through personal experience. The researchers found that faculty members having a favorable experience with a technology were more likely to include them in their courses (Bai & Ertmer, 2008).

Faculty members who cannot conceptualize the benefits or are unable to easily navigate the technology will perceive the technology as a barrier (Dusick, 1998; Peluchette & Rust, 2005; Reznich, 1997). Keenqwe, Kidd, and Kyei-Blankson (2009) stated that for adoption to occur faculty

> need to familiarize themselves with the technology, utilize the technology, integrate the technology into their teaching, transition to the reorientation phase, realign their teaching and student learning outcomes with the technology, and finally become revolutionized in

> their teaching practices where technology usage is evident, and the process facilitates the quality teaching and active student learning mission. (p. 28)

Bitner and Bitner (2002) stated that instructors must have a certain level of motivation to endure the turmoil and frustration that can occur during the adoption process.

Fear of change. The fear factor can also serve as a barrier to adoption of instructional technologies. Falvo (2003) stated that instructors that fear technology are less likely to adopt. Bitner and Bitner (2002) also noted that additional anxiety and concern were found in instructors when they were forced to change or move beyond their personal comfort zone. Similarly, Willis, Tucker, and Gunn (2003) discussed how the adoption process can change ideas, attitudes, and ultimately behaviors. However, it can also potentially increase the level of fear associated with the process. Steel and Hudson (2001) elaborated on these fears, referring to them as "worst case scenarios" (p. 109). Examples included technological failure, devaluing of relationship between instructor and student, and a perceived lack of control over the technology as barriers to the adoption process.

Needs of students. Implementation of new instructional technology initiatives not only affect instructors but also impact their students. This interaction serves as a barrier to adoption for some faculty as they fear the impact it may have on students. Cardenas (1998) asserted that technology enhanced courses were not equal to traditional courses. Steel and Hudson found that instructors were concerned that the loss of face-to-face interactions would be detrimental to the educational process. DenBeste (2003) also described a belief that various instructional technologies will alienate students. Other researchers have identified methods to help instructors overcome this barrier including the development of support services (Zayim et al., 2006), models designed to improve student achievement levels, and learning that is complemented by the instructional technology (Bitner & Bitner, 2002).

Faculty members have also acknowledged that the needs of students are factor in the adoption process (Appana, 2008; Sugar et al., 2004). Sugar et al. demonstrated that teachers believed that any benefits of adopting new technologies were directed towards the students. Teachers also believed technology benefited students by preparing them for the future, exposing them to new technologies, enabling new skill sets, and holding the students' interest in courses, although they did not see a specific benefits for themselves. Appana indicated additional benefits as viewed by faculty, including a diversified population that challenges course development and delivery. Appana also found that faculty development activities benefit faculty and prepare them for the future direction of education.

Institutional support. A number of support structures can be utilized by an institution to facilitate the adoption of instructional technology. Failure to recognize the importance of institutional support, however, can serve as a barrier to the adoption process. Anderson (1997) cited the lack of institutional and departmental funding, lack of time, and lack of adequate infrastructure as barriers to the adoption of technology. Similarly, Sahin and Thompson (2007) found that faculty adoption concerns were based on lack of time, technical assistance, and infrastructure of current systems. Another area that facilitates adoption is the availability of professional development opportunities (Bitner & Bitner, 2002; Howland & Wedman, 2004; Jaber & Moore, 1999). Researchers also support the need for institutions to provide the necessary equipment to meet the desires of the organization to institute instructional technology (Jaber & Moore; Zayim et al., 2006). Institutions can improve support systems not only for faculty but also for students to respond to problems that may develop (Bitner & Bitner, 2002; Falvo, 2003;

Koehler et al., 2004; Sandholtz, 2001; Zayim et al., 2006). Increasing the support systems for students can also alleviate faculty concerns for students.

Institutional reward structure. Another institutional area that can act to facilitate change is the institutional reward system. Utilization of incentives, including time release and monetary rewards, can also act as institutional facilitators (Schrumm et al., 2003). Institutional promotion and rank policies can also be used to develop a climate that nurtures the utilization of instructional technologies (Bitner & Bitner, 2002). Bitner and Bitner (2002) found that adjusting promotion and rank policies can help improve the adoption rates of current initiatives engaging instructional technology. Anderson, Varnhagen, and Campbell (1998) also cited recognition in tenure and promotion documents and reduced teaching loads as other motivators valued by faculty members. Zayim et al. (2006) reiterated the importance of a reward system to facilitate adoption by faculty. Howland and Wedman (2004) stated that initiatives, such as new equipment and programs, are other examples of institutional rewards that can help lead faculty to the adoption of new technologies.

Perceived usefulness of instructional technology. Faculty will critique instructional technology based on the authenticity of their experience with it (Schrumm et al., 2003). Schrumm et al. demonstrated how faculty members base their decisions to adopt on the applicability of the given product to their particular field. Steel and Hudson (2001) examined the experiences and perceptions that teachers had with educational technologies and identified three specific areas that teachers found crucial in deciding to adopt instructional technology. The first area was value, which teachers viewed in the context of time saved and time lost (Steel & Hudson). Secondly, the teachers also needed to view the technology "as [an] enriching teaching and learning experience" (Steel & Hudson, 2001, p. 108) that benefited the student. Finally, teachers needed to feel that the technology was flexible and could meet their needs in the classroom. Steel and Hudson found that teachers were more likely to adopt the instructional technology if it benefited the student and had sustainable value to add to the material being delivered. Similarly, Zayim et al. (2006) discussed how a user must define the innovation as relevant and useful before he or she would consider adoption.

Demographics of adopters. The demographics of faculty have been shown to have little impact on the adoption rates for instructional technology (Rogers, 2003; Sahin & Thompson, 2007; Zayim et al., 2006). Sahin and Thompson found no significant difference in participant demographics (gender, academic year, number of students taught and supervised) and the level of use of instructional technology by faculty. In a similar study (Zayim et al., 2006), rank, sex, age, discipline, teaching experience, computer use self-efficacy, and perceived value of instructional technology were found to have no significant impact. Li and Linder (2007) also found no significant differences in adoption in the demographic areas of gender, age, and academic rank, but did find significant differences in professional area, level of education, teaching experience, and distance education experience.

Summary of facilitators and barriers. Collectively, the facilitators and barriers to adoption of instructional technology (see Table 2) can help provide background to the process of change in higher education. Successful adoptions and even failed attempts can be dissected and studied to understand the process of change and ultimately the adoption and diffusion of an innovation over time. The importance of the individual in the process leads investigators to evaluate and implement plans based on individual adopters. By evaluating individual adopters, researchers can begin to understand the diffusion process of an innovation through a specific population. Several researchers have developed theories of adoption that provide background to the process of individual adoption and population diffusion of an innovation.

Table 2
Factors Affecting the Adoption of Instructional Technology

Factor Affecting Technology Adoption	Research Identifying Factor
Training for instructional technology	Bitner & Bitner, 2002; Howland & Wedman, 2004; Jaber & Moore, 1999; Koehler et al., 2004; McNaught et al., 2000; Schrumm et al., 2003
Available time for instructional technology development	Schrumm et al., 2003; Cardenas, 1998; Koehler et al., 2004; McNaught et al., 2000; Sahin & Thompson, 2007
Faculty motivation	Bitner & Bitner, 2002; Dusick, 1998; Peluchette & Rust, 2005; Reznich, 1997; Bai & Ertmer, 2008; Keenqwe et al., 2009; McNaught et al., 2000
Fear of change	Bitner & Bitner, 2002; Falvo, 2003; Steel & Hudson, 2001; Willis et al., 2003
Needs of students	Appana, 2008; Bitner & Bitner, 2002; Cardenas, 1998; DenBeste, 2003; McNaught et al., 2000; Steel & Hudson, 2001; Sugar, Crawley, & Fine, 2004; Zayim et al., 2006
Institutional support	Anderson, 1997;Bitner & Bitner, 2002; Falvo, 2003; Howland & Wedman, 2004; Koehler et al., 2004; Jaber & Moore, 1999; McNaught et al., 2000; Sandholtz, 2001; Schrumm et al., 2003; Thompson, 2007; Zayim et al., 2006
Institutional reward structure	Anderson, Varnhagen, & Campbell,1998; Howland & Wedman, 2004; McNaught et al., 2000; Zatim et al., 2006
Perceived usefulness of instructional technology	Schrumm et al., 2003; Steel & Hudson, 2001;Zayim et al., 2006
Demographics of adopters	Li & Linder, 2007; Rogers, 2003; Sahin & Thompson, 2007; Zayim et al., 2006

Theories of Adoption

Change in education is a process that can be understood and managed through a variety of adoption theories. The subject of change in education has been polarized and represents several very different approaches to the process of evaluating and documenting the process (Ellsworth, 2000). The utilization of instructional technology by PDs can be better understood through the change process. It can then be evaluated through an adoption model that evaluates the needs of the individual. Failure to assess the individual can skew the current picture of adoption as well as the institutional schematics for change in the future.

Adoption and diffusion theories. Adoption theories are based on the individual's decision to either accept or reject a given innovation. Straub (2009) refers to adoption as a behavioral change. Adoption theory examines individual change while diffusion theory evaluates changes across a population over time. As displayed in Figure 2, Straub exhibits how individual adopters over time make up the diffusion curve for a given innovation. A distribution that is skewed to the left would show an increased number of early adopters while a distribution moving to the right would demonstrate an increased number of late adopters. A normal distribution would indicate a similar number of early and late adopters with a majority of the population adopting in approximately the same time frame. By evaluating the adopter and the diffusion curve researchers can understand the process behind acceptance of a given innovation.

Several models have been created to explain the adoption and diffusion process. Prominent models include Rogers' Theory of Innovation Diffusion (1962; see Figure 3); Hall's Concerns Based Adoption Model (1987; see Figure 4); and Davis' (1989) Technology Acceptance Model (see Figure 5).Straub (2009) indicated all of the models share some commonalities including: (a) individual characteristics, which are individual differences; (b) innovation characteristics, which are specific to the particular innovation, and (c) contextual characteristics, which capture the environment of adoption. He also concluded that even though "the decision to adopt or not to adopt an innovation can be a one-time event, the route that leads to one's decision does not take place in a vacuum" (Straub, 2009, p. 628). This idea shows that beliefs are formed over time and can be used in the adoption and diffusion process. Adoption and diffusion theories also expand on the work of Bandura (1997) and social cognitive theory, citing that individuals can learn from the collective's experiences as well as from their own experiences. Straub also cites Bandura's work on self-efficacy, defined as "beliefs in one's capabilities to organize and execute the courses of action required to produce given attainments" (Bandura, 1997, p. 3). Self-efficacy serves as a foundation linking the importance of an individual's belief in his or her ability to complete a given task. Combined, these components form the basis for a variety of adoption and diffusion models.

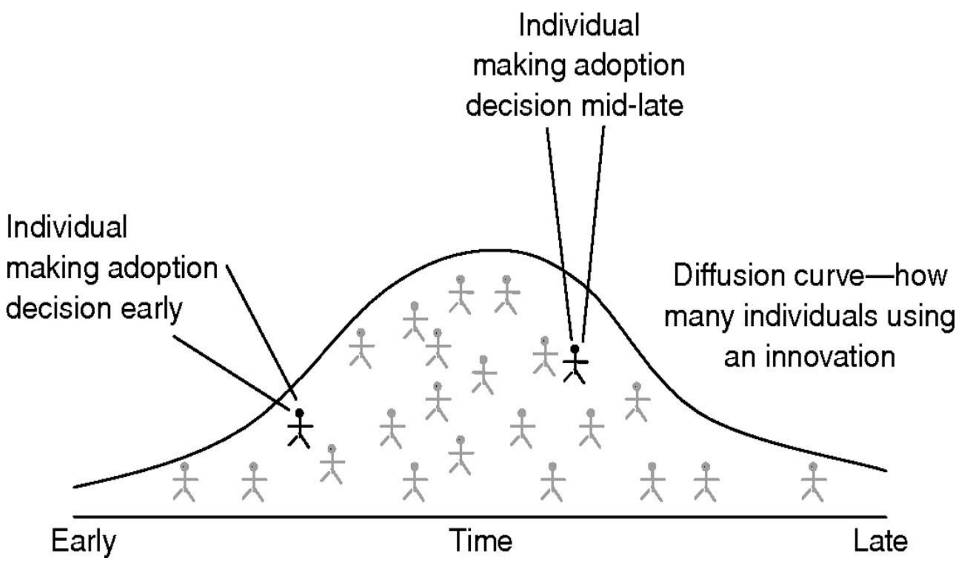


Figure 2. Individual adoptions and the diffusion curve. (Straub, 2009, p. 627)

Diffusion of Innovation Model. The Diffusion of Innovation Model (Figure 3) was proposed by Rogers in 1962. The model provides a structure for individual adoption as a five-stage model: knowledge, persuasion, decision, implementation, and confirmation. Diffusion on the other hand is "the process through which (1) an innovation (2) is communicated through certain channels (3) over time (4) among members of a social system" (Rogers, 1995, p. 5). Straub (2009) cites the "breadth and depth of the theory" (p. 632) as being a drawback for its use in a single study. A benefit of using the Diffusion of Innovation Model is its' design. The model was developed from a variety of fields including sociology, education, psychology and geography. This diverse foundation allows it to be theoretically integrated into a number of different research areas (Straub, 2009).

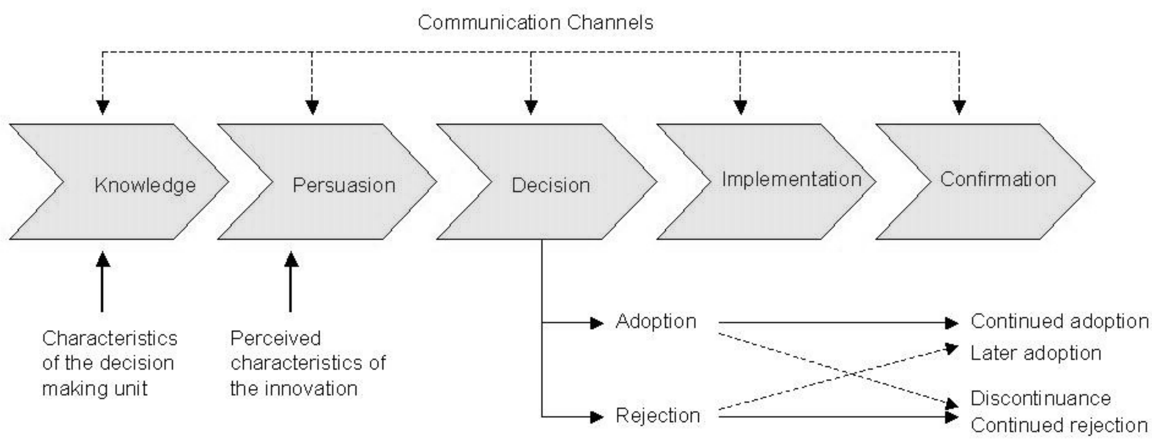


Figure 3. Diffusion of innovation model. (Rogers, 1995)

Technology Acceptance Model. The Technology Acceptance Model (TAM) was designed by Davis (1989). Straub described this theory as being based in computer science and striving to answer questions about the technology adoption process. The theory is centered on the individual's perception of technology and his or her perceived ease of use and perceived usefulness of a given innovation. Figure 4 displays the TAM and its three major components: the user, user motivation, and user response. The model accounts for individual differences in level of perceived use and perceived ease of use. Each individual's interpretation of usefulness and ease of use will directly impact their use of a given innovation. Those who view an innovation more favorable are more likely to adopt it than those who do not. Struab (2009) criticizes the TAM because it does not take into consideration the individual differences (e.g., age, gender) that influence technology adoption. Wolski and Jackson (1999) reported that the TAM is not specific enough to catch the nuances in the educational field. The researchers reported that the

TAM has currently only been used sparingly in education and further research should be completed before utilizing the theory in education (Wolski & Jackson, 1999).

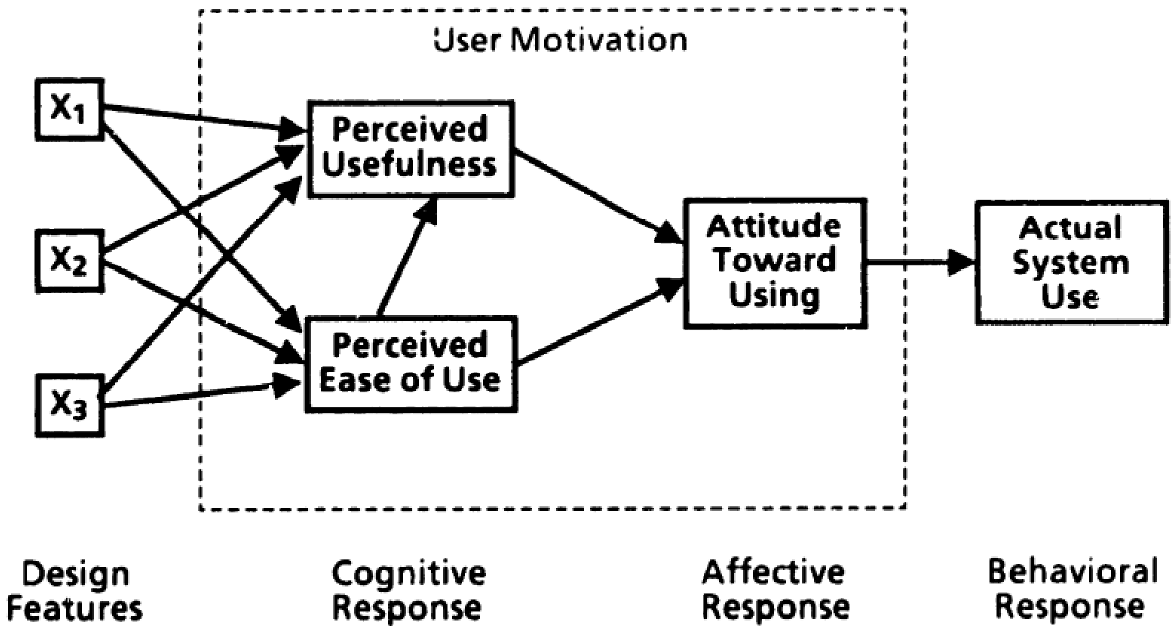


Figure 4. Technology acceptance model. (Davis, 1986, p. 24)

Concerns-Based Adoption Model. Hall's Concerns-Based Adoption Model (CBAM), shown in Figure 4, is based around the individual's experience with the adoption process. The objective behind the CBAM is to provide a tool to assist in "diagnosing group and individual needs during [innovation] adoption process" (Hall & Louckus, 1978, p. 36). Hall's model is constructed around six assumptions:

- Change is a process, not an event
- Change is accomplished by individuals
- Change is a highly personal experience
- Change involves developmental growth
- Change is best understood in operational terms
- The focus of facilitation should be on individuals, innovations, and context

(Hord, Rutherford, Huling-Austin, & Hall, 1987).

The model (see Figure 5) acknowledges that change is affected by three distinctly different influences: change facilitators, resource systems, and the user system culture. The change facilitator operates as an intermediary between systems drawing information from the user system culture and the resource system. The change facilitator is responsible for determining the concerns of the users using a variety of methods including probing and interviewing to understand the system. The change facilitators can then draw from the resource system to meet the needs of the user system. Within the framework of the CBAM are three dimensions: (a) Stages of Concern (SoC), (b) Levels of Use (LoU), and (c) Innovation Configuration (IC) (Hall & Hord, 1987, p. 17). The three dimensions of the CBAM each have a different role in the assessment of the adoption process within an organization. The first two dimensions, the SoC and the LoU, focus on the individual while the IC focuses on the organization.

The CBAM was designed for the educational setting, which is one of its strengths. It can provide researchers with both quantitative and qualitative data depending on which of the multiple components of the instrument are used. The major criticisms of the CBAM are the reliability and validity of the tool. Straub indicates the top-down design the CBAM uses when evaluating change limits its use in some situations. The CBAM also does not account for the student component of the adoption process. Even with its limitations, Straub cites the CBAM as being one of the most frequently used models used to describe the teacher adoption process.

Study Framework

For the sake of the present study, the primary researcher adopted the Concerns-Based Adoption Model to research the adoption of instructional technology by ATEP PDs. This model was constructed for use in the education setting. It is designed to diagnose “group and individual needs during [innovation] adoption process” (Hall & Louckus, 1978, p. 36). Further, the

Concerns-Based Adoption Model aligns with the research questions and target population of this study.

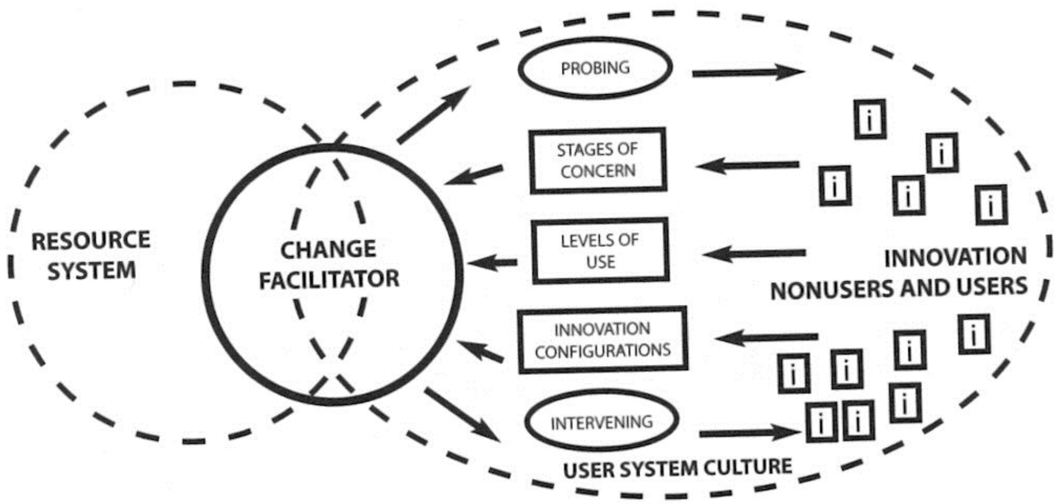


Figure 5. Concerns-based adoption model. (George, Hall, & Stiegelbauer, 2008, p. 1)

Concerns-Based Adoption Model. Hall and Hord (1987) have provided extensive research on the subject of change in education. Their research has identified the components that characterize change and how it is experienced by individuals, organizations, and systems. The researchers established 12 unique principles (see Table 3) that described the change process. These principles are not necessarily all encompassing, however, they typically present themselves, or at least surface, as underlying themes of the change process.

Hall and Hord (2006) illustrated change as a process that people and organizations travel through in a given direction at altering paces and not as an overnight process. They stated that this process can take anywhere from three to five years to complete. Failure to recognize this essential period of time often derails the process of change. Implementation plans that expect instantaneous results have an “event mentality” (Hall & Hord, 2006, p. 5). This event mentality leads to a lack of sufficient time to process through the components of change including; time to learn, coming to understand, and even the grief process.

Table 3

The 12 Principles of Change

Process	Change is a process not an event
Development and Implementation	There are significant differences in what is entailed in development and implementation of an innovation
Organization and Individuals	An organization does not change until the individuals within it change
Innovations	Innovations come in different sizes and can be either products or processes
Interventions	Interventions are the actions and events that are key to the success of the change process
Outcomes	There will be no change in outcomes until new practices are implemented
Administrative Leadership	Administer leadership is essential to long-term change success
Mandates	Mandates can work
Change Unit	The school is the primary unit for change
Facilitation	Facilitation is a team effort
Resistance	Appropriate interventions reduce resistance to change
Context	The context of the school influences the process of change

(Hall & Hord, 1986)

A relevant principle of change proposed by Hall and Hord (2006) is that organizational change cannot be completed without individual change. They stated that "successful change starts and ends at the individual level" (Hall & Hord, 2006, p. 7). This implementation can be introduced at the organizational level, but ultimately the acceptance of the change will be determined by the individual. Complicating the matter further is the idea that each individual may need varying amounts of time to internalize the change. The organization is made up of individuals that represent different levels of acceptance: individuals who grasp the information immediately, those who need additional time, and those who avoid the change. The process of change cannot be completed until each unique group has been addressed.

In addition to the method of dissemination, there are various organizational components that can influence the outcome of change. Hall and Hord (2006) described two important dimensions that can affect change in individuals and ultimately an organization. These two dimensions are *physical features* and *people factors*. Physical features pertain to characteristics unique to an organization including faculty arrangement, resources, policies, staff structure, and workloads. People factors were used to categorize individual attitudes, beliefs and value of persons making up the organization. These dimensions create the culture of an organization. According to Hall and Hord (2006), these two dimensions, when working together, have been demonstrated to create an environment that enhances staff performance and produces high-learner outcomes.

The Concerns-Based Adoption Model was created in response to a need to assess the value of a given innovation in the educational setting. Hall and Hord (1987) sought to understand the process behind which educators were adopting and implementing innovations into their respective settings. The group theorized that change was not as simple as providing individuals with something; rather it involved a much deeper process that ultimately could lead to adoption. Hall and Hord's research was based on this theory and led to the development of the CBAM.

Hall and Hord provide basic assumptions and assertions about the utilization of the CBAM. Their first assumption is that there is a personal side to change. The success of a given innovation is greatly affected by the ability for the "perceptions of the clients (e.g., teachers) [to] be understood by themselves and by the change facilitators" (Hall & Hord, 1987, p. 8). Hall and Hord identified one of the many reasons that innovations fail because "interventions are not made at appropriate times, places, or ways perceived by clients as relevant" (1987, p. 8). Finding a proper way to implement an innovation and meet the needs of individual adopters can ultimately increase the rate of success for an initiative.

The assertion that change is a process rather than an event reverses the mindset held throughout the early 1970s. Hall and Hord described this process as originally being an event approach, summarizing the event as the announcement of some type of change that was going to occur and then assuming it instantaneously became practice. After the change effort was launched facilitators believed that all clients were adopting the change. Clients were also believed to be utilizing the change correctly. In addition, only summative evaluations were completed to determine the success or failure of a given change event. The research of Hall and Hord (1987) demonstrated that change was a process and required time to complete.

The idea that change rests with the client was introduced in the work of Hall and Hord. The research attributed the level of acceptance by the client to the "ultimate effectiveness of an innovation" (1987, p. 10). Based on this assumption, Hall and Hord demonstrated the importance of acknowledging the individual's non-use or use of given innovation in determining the success of an implementation process. Understanding individuals' actions and opinions about an innovation can arm change facilitators with deeper understanding of the utilization of that innovation. The CBAM provides change facilitators with a method to evaluate a given implementation plan and subsequent adoption rate.

Development of the Concerns-BasedAdoption Model. Hall, George, and Dosset (1973) reviewed the CBAM in the context of other adoption models available at the time of its inception. The group discussed early work completed by Havelock (1971) on training for the change facilitator. Havelock formulated the term "linkage" through his research and Hall et al. (1973) and utilized it in constructing the CBAM. The group defined linkage as "a relationship that combines external resources with change facilitators to bring about change in the organization which can, but does not have to, involve the adoption of an innovation" (Hall, Wallace, & Dossett, 1973, p. 4). The idea of linkage was combined with current theories on diffusion of innovation and the role of the individual in the adoption process to form the basis of the CBAM.

A primary difference between the CBAM and Havelock's (1971) work is the idea of adoption. The CBAM assumes that a specific innovation will be adopted and focuses on the idea of user collaboration with a resource system. Havelock's theories, on the other hand, place an emphasis on institutionalization. Havelock stresses that an innovation goes through a process of introduction, adoption, and integration within an organization's culture (Hord, Rutherford, Huling-Austin, & Hall, 1987). Hall et al. (1973) explained the similarities as being an "emphasis [on] the trial of the innovation, its installation, and ultimate integration in the normal operating structure" (p. 4). They asserted, however, the CBAM is not interested with the institutional development, rather the actual adoption of the innovation. Adoption aligns with the work of Clark and Guba (1965) as it "involves the multitude of activities, decisions, and evaluations that encompass the broad effort to successfully integrate an innovation into the functional structure of a formal organization" (Hall, Wallace, & Dossett, 1973, p. 5) The CBAM focuses on the user and his or her capabilities as a problem solver to guide the adoption process.

Hall et al. (1973) describe the inception of the CBAM as an effort to provide public schools, colleges and universities, and industry a method to evaluate the adoption process. The CBAM was developed to provide an empirical method to investigate the adoption process within an organization. The theoretical basis of the work was on the research completed by Fuller (1969) on the concerns of beginning teachers. Fuller's (1969) work indicated a continuum of concerns that the prospective and in-service teachers underwent. The group refers to the process as the individual moving from concerns about self to concerns about the task and finally concerns about the impact that the innovation will have.

Hall et al. (1973) applied the work of Fuller (1969) to the adoption process. The group was able to map the sequences of concerns--self, task, and impact--to the adoption process. They expanded it to demonstrate that by understanding the level of concern of an individual a change facilitator could better address the needs of an organization. Since concerns can be used to access a person's needs, change facilitators can apply the outcome of the CBAM to guide designed interventions to achieve a particular goal. Utilization of the CBAM is based upon its function as a process model. It is constructed on the assumption of the presence of two primary systems and the temporary system: user system, resource system, and collaborative adoption system, respectfully. Hall et al. (1973) referred to the resource system as the institution that is sponsoring the change. The user system in the CBAM is the adopter of the given innovation. For the system to function, the resource system, the institution, should be designed to transfer power to the user system, the adopter, as the innovation adoption process occurs. The temporary collaborative system exists as a facilitator of the adoption process and is composed of both the user and resource systems.

Understanding the process model of the CBAM allows administrators to utilize the model accordingly. The temporary collaborative system that is formed is used to create feedback between the user and resource systems and is operated by the change facilitator. The change facilitator can then use any of the three dimensions of the CBAM to analyze the adoption process. The three dimensions of the CBAM--SoC, LoU, and IC--can be used independently of each other to address the needs of the change facilitator. The SoCQ measures the concerns of the users regarding an innovation. This information can be utilized to address the needs of the user system through the resource system. The particular SoC for the individual can be measured through utilization of the SoCQ. It offers a user profile that will identify which SoC for each participant. The second dimension, the LoU construct, is used to evaluate the extent to which individuals are utilizing a given innovation within an organization. The LoU provides researchers with five behavioral profiles for users and three for nonusers. The IC dimension of the CBAM is designed to examine a given innovation from a global perspective. It provides change facilitators with different implementations of an innovation across the organization. For the purpose of the current study, the primary researcher has adopted the SoC portion of CBAM to investigate the SoC that PDs in ATEPs have with the innovations of instructional media and instructional design.

The Stages of Concerns. Hall (2006) adapted the idea of "concerns" from the work of Fuller (1969). Fuller utilized the term to represent an individual's feelings and perceptions. The idea that concerns were influenced by an individual's personal experiences laid the groundwork for the CBAM (Hall & Hord, 2006). Fuller continued research on the concerns of student teachers and hypothesized that concerns progressed through four levels: unrelated, self, task, and impact (see Figure 6). Her research revealed tendencies existed between the level of concern individuals were in and where they were in an adoption process: pre-service teachers had concerns in self and task areas while experienced teachers were typically in the task and impact related concerns areas. Hall and Hord (2006) expanded the idea to reflect the role personal feelings and perceptions played on an adoption process regardless of circumstances. They linked an individual's perception of a situation to the guiding force in adoption not the system or change facilitator (Hall & Hord, 2006). This theory changed the way that researchers could evaluate the adoption process and change within an organization.

IMPACT	6	Refocusing	The individual focuses on exploring ways to reap more universal benefits from the innovation, including the possibility of making major changes to it or replacing it with a more powerful alternative.
	5	Collaboration	The individual focuses on coordinating and cooperating with others regarding use of the innovation.
	4	Consequences	The individual focuses on the innovation’s impact on students in his or her immediate sphere of influence. Considerations include the relevance of the innovation for students; the evaluation of student outcomes, including performance and competencies; and the changes needed to improve student outcomes.
TASK	3	Management	The individual focuses on the processes and tasks of using the innovation and the best use of information and resources. Issues related to efficiency, organization, managing, and scheduling dominate.
SELF	2	Personal	The individual is uncertain about the demands of the innovation, his or her adequacy to meet those demands, and/or his or her role with the innovation. The individual is analyzing his or her relationship to the reward structure of the organization, determining his or her part in decision making, and considering potential conflicts with existing structures or personal commitment. Concerns also might involve the financial or status implications of the program for the individual and his or her colleagues.
	1	Informational	The individual indicates a general awareness of the innovation and interest in learning more details about it. The individual does not seem to be worried about himself or herself in relationship to the innovation. Any interest is in impersonal, substantive aspects of the innovation, such as its general characteristics, effects, and requirements for use.
	0	Unconcerned	The individual indicates little concern about or involvement with the innovation

Figure 6. The Stages of Concern about an innovation. (George et al., 2008, p. 8)

Fuller’s (1969) initial research provided further ground work for Hall et al. (1977) as they developed the seven SoCs. While researching the concerns of individuals in schools, colleges, and businesses, the group defined seven SoCs: unconcerned (Stage 0), informational (Stage 1), personal (Stage 2), management (Stage 3), consequences (Stage 4), collaboration (Stage 5), and refocusing (Stage 6; see Figure 6). The original areas of concern hypothesized by Fuller (i.e., unrelated, self, task, and impact) remained in the new classifications. The SoC "refined" (Hall, 1985) Fuller's original work to expand to seven SoC (Stages 0-2 representing Self, Stage 3 signifying Task related concern, and Stages 4-6 as Impact concerns; see Figure 6). The group's research points to a "quasi-developmental path to the concerns as a change process unfolds" (Hall & Hord, 2006, p. 63). The pathway an individual takes is not guaranteed, and he can move forward or step back through a change process. The concept for the SoCs was for the model to represent the developmental approach that the group viewed as successful (Hall, Wallace, & Dossett, 1973).

Interpreting the Stages of Concerns. Hall et al. (1977) postulated that change occurred as a result of process, not a single event. However, as discussed earlier, previous concerns can progress or regress based on an individual's given situation. After completing the Stages of Concern Questionnaire (SoCQ) a concerns profile is created from the relative levels of intensity on a given SoC. This profile graphically represents the concerns of an individual as they relate to a given innovation. The profile represents a wave form that peaks in the area where an individual has the largest concentration of concerns. In an ideal setting, the hypothesized wave motion can be demonstrated by an individual as they move through the various stages of change dealing with a particular innovation (Hall & Hord, 2006; see Figure 7). Hall and Hord (2006) also reiterated the importance of time—three to five years—for the intensity of a given concern to change enough for a shift to occur between stages (Hall & Hord, 2006).

The analysis of the various curves can be conducted through the use of the *Measuring Implementation in Schools: The Stages of Concern Questionnaire Manual* (George, Hall, & Stiegelbauer, 2008). This manual provides researchers with a method to analyze data collected through the SoCQ. Hall and Hord (2006) summarize the process by indicating the importance of peaks and valleys in a user profile. The percentile that is produced by the SoCQ does not bear as much importance as the shape that is produced by the results. By matching the corresponding peak and valley to the definitions of the SoC in Figure 7, the researcher is able to determine which concerns are intense (peak) and those of no concern (valleys).

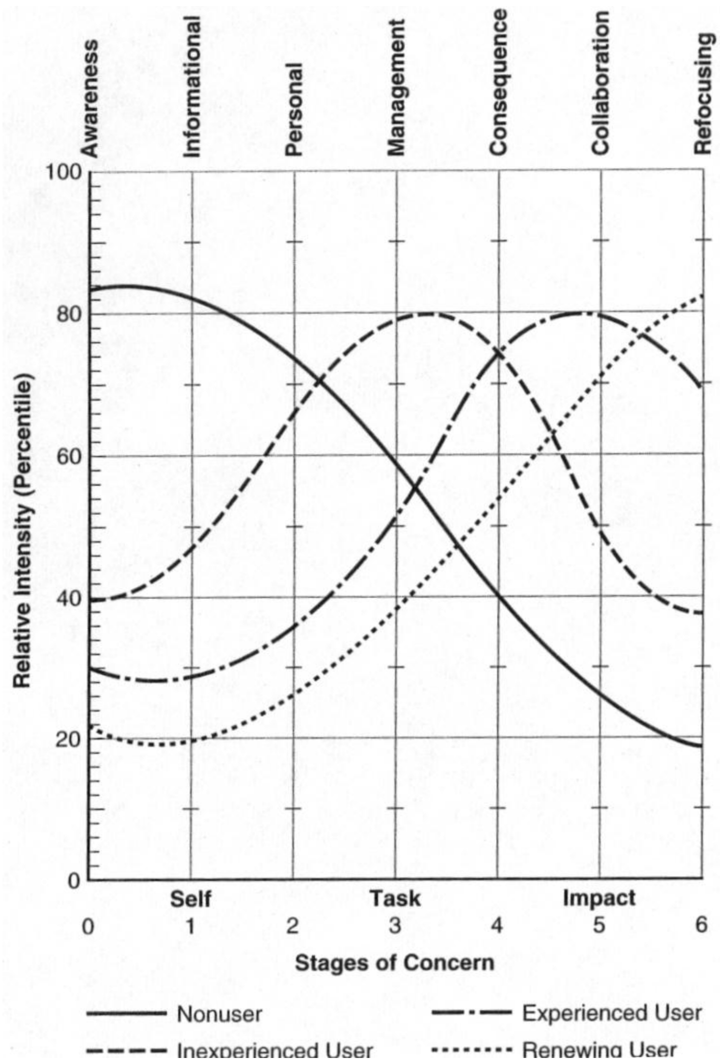


Figure 7. Ideal wave motion development of SoCs (Hall & Hord, 2006, p. 66)

In an ideal situation, where a standard curve is elicited, the wave motion of concerns is anticipated when evaluating an innovation over time (Hall et al., 1977). As individuals' feelings and perceptions about the innovation progress the curve will move forward similar to a wave.

Acceptance of the innovation will result in a decrease in the Self Stage while increasing intensity in the Impact Stages. This movement in intensity results in the wave motion on the individual SoC profiles (Hall & Hord, 2006; George, Hall, & Stiegelbauer, 2008).

For this project, the researcher plans to utilize the CBAM to determine the peak SoC for PDs in ATEPs. By evaluating the concerns of the PDs, the researcher will be able to understand the level of adoption for instructional technology use in ATEPs. This information will allow the investigator to report on current concerns of PDs. It will also provide a road map of how to develop professional development strategies to address the concerns of ATEPs.

Chapter Summary

This chapter provided a review of the literature on the utilization of instructional technology in ATEPs, including an in-depth overview of the history of athletic training and ATE. Research on the utilization of instructional technology across a variety of settings linking trends between higher education and allied health education were highlighted. Current research in higher education and allied health education on instructional technology provide the foundation of the present study in ATEPs. This chapter also demonstrated the limited nature of the current body of research in ATEPs on instructional technology. The current body of research is outdated and can no longer be used to represent the field. Further, research on instructional technology is also myopic in its definition and does not represent the broader field, which is made up of instructional media and instructional design.

This review of the literature also examined facilitators and barriers to the adoption process. The adoption of instructional technology has been shown by a number of researchers to be influenced by a number of factors, including age, gender, rank, tenure, and personal views. Current research in ATEPs has not explored these variables and, more importantly, has not studied their impact on the adoption of instructional technology. Fincher and Wright’s (1996) research evaluated these variables but lacked a comprehensive definition of instructional technology and a mechanism to gauge the adoption process.

To address the adoption process, this chapter assessed a number of adoption and diffusion theories. Ultimately, the CBAM was selected based on its design for use in the educational setting and extensive use in previous studies in higher education settings. The SoCQ portion of the CBAM was chosen based on its ability to analyze individual perceptions as a response to implementing a given innovation. The SoCQ can provide the researcher with an idea of the peak SoC, or greatest concern, of the individual adopter at the time of the survey. Currently, no studies exist utilizing the CBAM to evaluate PDs’ adoption of instructional technology in ATEP.

The goal of this research is not only to serve as an evaluator of demographic, academic, and innovation precursors to adoption, but also to provide deeper understanding of where current PDs of ATEPs stand in the adoption process of instructional technology. In addition, this study is designed to provide a clearer understanding of the current tendencies of PDs in ATEP when it comes to defining and utilizing instructional technology in their curriculums. The findings will provide the researcher, professional organizations, and institutions of higher education with insight to develop and implement effective professional development to address the concerns of the faculty in ATEPS with the innovation of instructional technology.

CHAPTER THREE

METHODOLOGY

This study sought to determine the Stage of Concern (SoC) of program directors (PDs) of Committee for Accreditation of Athletic Training Education Programs (CAATE) accredited Athletic Training Education Programs (ATEPs) with the innovations of instructional media and instructional design and to evaluate the variables that influence them. Nine research questions guided the analyses. The purpose of this chapter is to describe the methodology the researcher employed to explore the research questions. The chapter is divided into three major sections: research method, procedures, and limitations.

Research Method

This study employed a survey research design. deLeeuw, Hox, and Dillman (2008) define surveys as "a research strategy in which quantitative information is systematically collected from a relatively large sample taken from a population" (p. 2). Fowler (2009) describes surveys as being a method for producing statistics that are quantitative descriptions of some aspect of a population; typically, data are only collected from a sample of a population. The data are collected by asking subjects questions and then utilizing their answers as data points in an analysis.

Participants

PDs were selected as a representative population of ATEP faculty. The CAATE defined PDs as "full-time faculty member of the host institution and a BOC Certified Athletic Trainer responsible for the administration and implementation of the ATEP" (CAATE Standards, 2008,

p. 19). Their responsibilities, defined in section B1.2 CAATE Standards (2008), include the administration of the ATEP. The administration of an ATEP 367/includes curricula planning and development. The PD has the “institutional responsibility or oversight for the day-to-day operation, coordination, supervision, and evaluation of all components (academic and clinical education) of the ATEP” (CAATE Standards, 2008, p. 3). These responsibilities to administer the ATEP make the PD the best candidate to represent the program and decisions made within it.

Sampling Plan

The primary investigator used the CAATE website to construct a list of PDs at either undergraduate or graduate entry-level athletic training education programs. The primary investigator then visited each program’s website and verified the information. It is required by CAATE that all ATEPs keep accurate websites with faculty and program information. This requirement provides a reliable crosscheck for the sample population.

The target sample for this study was all 367 PDs currently in positions at CAATE accredited undergraduate and/or post certification ATEPs in the United States as of June 2011. It was required that all participants had been active PDs during the calendar year of May 2010 through May 2011. Of the 367 who were asked to participate, 57 completed all components of the survey.

Sample Size Calculation. To determine the sample size for this study, the alpha level, power, and effect size must be evaluated. Cohen’s test was utilized to determine the appropriate sample size. Ideally, a MANOVA study with values of alpha = 0.05, effect size = 0.15, and power of 0.80 are desirable. Table 4 displays Cohen’s suggested number of subjects for a given independent variable based on the number of groups within each variable. In a meta-analysis study Cook, Heath, and Thompson (2000), found that the “response rate for 68 surveys reported in 49 studies was 39.6%" (p. 829). Using the 39.9% response rate as a guide the researcher estimated the number of recipients necessary to reach the power and effect size desired. The required sample sizes are also displayed in Table 5. In determining sample size the available population must be considered. Currently there are 367 CAATE accredited programs, 344 undergraduate and 23 entry-level masters. For this study with 11 separate independent variables, a medium effect size, and an antedated response rate of 39.9%, the researcher would need a population of over 4000 participants. That estimate is well over the actual size of the population and will be a limitation of this study.

Table 4
Sample Size Required for Desired Effect Size

	Number of subgroups in the independent variable being evaluated							
Effect size	2	3	4	5	6	7	8	9
0.1 Small	788	969	1096	1200	1290	1372	1448	1512
0.15	352	432	492	540	576	616	648	684
0.2	200	246	280	305	330	350	368	387
0.25 Medium	128	159	180	200	216	231	240	252
0.3	90	111	128	140	150	161	168	180
0.35	68	84	96	105	114	119	128	135
0.4 Large	52	66	76	80	90	98	104	108

(Cook et al., 2000, p. 829)

Table 5
Survey Request Required for Desired Effect Size

	Number of subgroups in the independent variable being evaluated							
Effect size	2	3	4	5	6	7	8	9
0.1 Small	1975	2429	2746	3007	3233	3439	3629	3789
0.15	883	1083	1233	1353	1444	1543	1624	1714
0.2	502	616	701	764	827	878	922	970
0.25 Medium	320	398	451	501	541	579	601	632
0.3	225	279	320	351	375	403	422	452
0.35	170	210	240	263	285	299	321	339
0.4 Large	130	165	190	201	225	246	261	271

Note. The sample size for survey request to reach desired effect size was calculated using Cook et al.'s (2000) response rate of 39.9%.

Instrumentation. The instrument chosen for this study was the SoCQ portion of the CBAM. The SoCQ is a 35-item survey that uses an eight-point Likert scale. The purpose of the SoCQ is to determine the level of concern of individuals participating in a change process. It is one of three diagnostic tools that comprise the CBAM (Anderson, 1997). The results of the SoCQ provided the researcher with individual and group composites of the SoCs of PDs. The SoCQ was run twice, once for each component of instructional technology, instructional media and instructional design. The two versions of the SoCQ used in this study are provided in Appendix A.

Development of the SoCQ. The SoCQ was designed as one piece of the CBAM to assess the feelings, perspective, and attitudes of individuals as they are faced with some type of innovation (Hall et al., 1977). Hall and Hord (1987) designed the SoCQ to be a systematic method for researchers to conduct studies where the reliability of data is important. For the purposes of this study a cross-sectional survey design, data gathered via a survey at a particular point in time (Vogt, 1999), will be utilized.

The SoCQ is constructed with three different sections: introduction, demographic, and the actual 35 Likert-scaled items based on the SoCs. The first portion of the SoCQ is customizable and is intended to provide directions and definitions to individuals completing the survey. This portion of the survey indicated the innovation being studied in the instrument. Since the SoCQ was administered twice, the introduction provided the subjects with the innovation definition for that portion of the study. The general term of innovation was replaced with instructional media and ID, each in a respective SoCQ subset of the survey. The second portion of the survey was utilized to collect (a) personal demographics (see Table 6), (b) academic demographics (see Table 7), and (c) innovation characteristics (see Table 8). This information provided descriptive statistics of the respondent as well the basis for analysis for this research. The final section of the survey represented the two versions of the SoCQ. Each section used the 35 questions investigating each of the seven areas of concerns. These questions and their corresponding areas of concern are identified in Table 9.

Table 6
Questionnaire Breakdown for Personal Demographics (Independent Variables)

Item	Variable	Scale Type	Data Type	Coding Method		Topic Examined
8	IV	Multiple-choice, single response	Categorical	0	20-29	Age
				1	30-39	
				2	40-49	
				3	50-59	
			Categorical	0	30-39 years old	
				1	40-49 years old	
				2	50 years old and older	
			Dichotomous	0	30-39 years old	
				1	40 years old and older	
9	IV	Multiple-choice, single response	Dichotomous	0	Male	Gender
				1	Female	

Note. Survey Instrument is located in Appendix B.

Dependent variables. The dependent variables were the seven SoCs: unconcerned (0), informational (1), personal (2), management (3), consequences (4), collaboration (5) and refocusing (6). Table 9 shows a mapping of the dependent variables to the questions on the SoCQ. The loading of the questions onto their respective SoCQ is displayed in Table 10. Each of the SoCs were composed of five unique questions.

Table 7

Questionnaire Breakdown for Academic Demographics (Independent Variables)

Independent Variable	Scale Type (Data Type)	Original Coding	Secondary Coding	Dichotomous Coding
Tenure Status	Multiple-choice, single response (Categorical)	0 Clinical or Non-Tenure 1 Tenure-Track 2 Tenured		0 Clinical or Non-Tenure 1 Tenure-Track or Tenured
Academic Rank	Multiple-choice, single response (Categorical)	0 Adjunct Instructor 1 Instructor 2 Assistant Professor 3 Associate Professor 4 Full Professor		
Highest Degree	Multiple-choice, single response (Categorical)	0 Bachelors 1 Masters 2 Doctorate 3 Other		0 Non-terminal Degree 1 Terminal Degree
Average Course Load	Multiple-choice, single response (Categorical)	0 0-3 hours per semester 1 3-6 hours per semester 2 7-9 hours per semester 3 10-12 hours per semester	0 10-12 hours per semester 1 7-9 hours per semester 2 0-6 hours per semester	0 7-12 hours per semester 1 0-6 hours per semester
Teaching Experience	Multiple-choice, single response (Categorical)	0 0-5 years 1 6-10 years 2 11-20 years 3 21-30 years 4 31- higher years	0 0-10 Years 1 11-20 Years 2 21 Years and Higher	
Basic Carnegie Level	Multiple-choice, single response (Categorical)	0 RU/VH: Research Universities (very high research activity) 1 RU/H: Research Universities (high research activity) 2 DRU: Doctoral/Research Universities 3 Master's L: Master's Colleges and Universities (larger) 4 Master's M: Master's Colleges and Universities (medium) 5 Master's S: Master's Colleges and Universities (smaller) 6 Bac/A&S: Baccalaureate Colleges--Arts & Sciences 7 Bac/Diverse: Baccalaureate Colleges--Diverse Fields 8 Bac/Assoc: Baccalaureate/Associate's Colleges	0 Bachelor's Granting 1 Master's Granting 2 Doctorate Granting	0 Bachelors or Masters Granting 1 Doctorate Granting

Note. Survey instrument is located in Appendix D.

Table 8

Questionnaire Breakdown for Innovation Characteristics (Independent Variables)

Independent Variable	Scale Type (Data Type)	Original Coding	Secondary Coding	Dichotomous Coding
User Definition of Instructional Technology	Multiple-choice, single response (Categorical)	0 Tools (IM) 1 Process (ID) 2 Tools and Process (Instructional Technology)		0 Tools (IM) or Process (ID) 1 Tools and Process (Instructional Technology)
Level of Experience with Instructional Media	Multiple-choice, single response (Categorical)	0 Non-user 1 Novice 2 Intermediate 3 Experience 4 Past User	0 Non-user or Novice 1 Intermediate 2 Experienced	0 Non-user or Novice 1 Intermediate or Experienced
Professional Development with Instructional Media	Multiple-choice, multiple response (Categorical)			0 Yes 1 No
Level of Experience with Instructional Design	Multiple-choice, single response (Categorical)	0 Non-user 1 Novice 2 Intermediate 3 Experience 4 Past User	0 Non-user or Novice 1 Intermediate 2 Experienced	0 Non-user or Novice 1 Intermediate or Experienced
Professional Development with Instructional Design	Multiple-choice, multiple response (Categorical)			0 Yes 1 No

Note. Survey instrument is located in Appendix D.

Table 9

Stages of Concerns Questionnaire (Dependent Variables)

Peak Score	Instructional Media	Instructional Design	Data Type
Impact			Ordinal
Refocusing (6)	Q15, Q22, Q33, Q35, Q44	Q50, Q57, Q68, Q70, Q79	
Collaboration (5)	Q18, Q23, Q31, Q40, Q42	Q53, Q58, Q66, Q75, Q77	
Consequences (4)	Q14, Q24, Q32, Q47, Q45	Q49, Q59, Q67, Q82, Q80	
Task			
Management (3)	Q17, Q21, Q29, Q38, Q47	Q52, Q56, Q64, Q73, Q82	
Self			
Personal (2)	Q20, Q26, Q30, Q41, Q46	Q55, Q61, Q64, Q76, Q81	
Informational (1)	Q19, Q27, Q28, Q39, Q48	Q54, Q62, Q63, Q74, Q83	
Unconcerned (0)	Q16, Q25, Q34, Q36, Q43	Q51, Q60, Q69, Q71, Q78	

Note. Survey instrument is located in Appendix D.

Table 10

Questionnaire Breakdown for Dependent Variable Related Questions SoCQ

Item	Variable	Scale Type	Data Type	Coding Method		Topic Examined
13-48	DV	Likert Scale	Ordinal	1	Stage 0	PD Peak SoC for IM
				2	Stage 1	
				3	Stage 2	
				4	Stage 3	
				5	Stage 4	
				6	Stage 5	
				7	Stage 6	
			Dichotomous	0	Lower Peak SoC	
				1	Higher Peak Soc	
52-87	DV	Likert Scale	Ordinal	1	Stage 0	PD Peak SoC for ID
				2	Stage 1	
				3	Stage 2	
				4	Stage 3	
				5	Stage 4	
				6	Stage 5	
				7	Stage 6	
			Dichotomous	0	Lower Peak SoC	
				1	Higher Peak Soc	

Note. Survey instrument is located in Appendix D.

Independent Variables. The independent variables were categorized as follows: (a) personal demographics (see Table 6), (b) academic demographics (see Table 7), and (c) innovation characteristics (see Table 8). Personal demographics contained two independent variables: gender and age range. Academic demographics included six independent variables: tenure status, rank, advanced degree, average course load, teaching experience, and basic Carnegie level. Innovation characteristics had five independent variables: definition of instructional technology, level of experience with instructional media, level of experience with instructional design, prior training in instructional media, and prior training in instructional design. The Southwest Educational Development Laboratory (SEDL) provided the researcher with the ability to modify the SoCQ to create specified groups for analysis. The researcher added specific questions to the SoCQ to measure the each of these independent variables. The researcher utilized subgroup analysis for each of the independent variables.

Reliability and validity. Hall and George (1979) preformed reliability testing on the SoCQ. The researchers utilized a stratified sample of 830 teachers and professors to determine internal reliability of the SoCQ. The alpha coefficients for the seven scales ranged from 0.64 to 0.83, as shown in Table 11. Two weeks later, a subset of 171 teachers was asked to complete the SoCQ again. The 132 teachers that completed the second round of the SoCQ returned correlations of 0.65 to 0.86 (see Table 12). Hall and George felt these statistics indicated satisfactory reliability levels for the SoCQ.

Table 11

Coefficients of Internal Reliability for Stages of Concerns Questionnaire.

Stage	0	1	2	3	4	5	6
Alpha	0.64	0.78	0.83	0.75	0.76	0.82	0.71

Note. *N* = 830 (Hall et al., 1977, p. 7)

Table 12

Test-retest Correlations on the Stages of Concern Questionnaire

Stage	0	1	2	3	4	5	6
Alpha	0.65	0.86	0.82	0.81	0.76	0.84	0.71

Note. *N* = 132 (Hall et al., 1977, p. 7)

The construct validity of the SoCQ has been studied by a number of researchers. Cheung, Hattie, and NG (2001) reported on the psychometric and conceptual problems of the SoCQ. The researchers first address the psychometric issues of the SoCQ looking at the reliability as reported by Hall et al. (1977; see Table 11). The group points to a number of studies demonstrating low reliability in particular with Stage 0 and Stage 6 (see Table 12). Cheung, Hattie and Ng (2001) also reported discrepancies in the reliability of the measurement tool as well (see Table 13). The researchers cited the work of Bailey and Palsha (1990), Holloway, Eros, and Lerr (1980), and Shotsberger and Crawford (1996) to demonstrate the underlying issues with reliability (Cheung et al., 2001). The group states that “the exact dimensionality of the concerns construct is unclear and empirical support for the construct validity of the SoCQ data has yet to be determined (p. 228).

Table 13
Alpha Reliability Coefficients Reported in Past Studies

	Subscale						
Study	0	1	2	3	4	5	6
Hall et al. (1977, N = 830)	0.64	0.78	0.83	0.75	0.76	0.82	0.71
Bailey & Palsha (1992, N = 142)	0.42	0.67	0.77	0.64	0.79	0.77	0.61
Jibaja-Rusth et al. (1991, N = 00)	0.12	0.48	0.78	0.86	0.88	0.61	0.54
Shotsberger& Crawford (1996, N = 376)	0.45	0.66	0.72	0.69	0.60	0.77	0.52
Shotsberger& Crawford (1996, N = 273)	0.42	0.58	0.71	0.63	0.64	0.74	0.48

(Cheung et al., 2001)

Cheung et al. (2001) investigated the construct of other models of the SoC that developed alternate models with differing numbers of stages. The researchers pointed to three conclusions from their analysis. The first of which was none of the models evaluated yielded a fit to the data observed indicating the “uncritical use of any of the models in education research could be dangerous” (Cheung et al., 2001, p. 235). The group found that their research supported Hall’s conceptualization of SoCQ, but it appeared to fit better with a five stage model rather than the proposed seven stages. The five stage construct proposed by Cheung et al. utilized 22 items and created a better fit for the data but still produced anomalies in stage zero. This discrepancy in stage one may be irrelevant in the change process. As a result, the researchers do not recommend their five stage model of the SoC as a replacement for the Hall's original work, but rather caution researchers to evaluate the process thoroughly.

Hall et al. (1977) discussed the difficulty of validating the SoCQ due to the unavailability of other measures of concerns. The group used the Cronbach and Meehl's strategy to determine validity of the instrument. The group utilized "intercorrelation matrices, judgment of concerns based on interview data, and confirmation of expected group difference and change over time [were] used to investigate the validity of the SoCQ scores" (Hall et al., 1977, p. 12) to provide validation to the questionnaire early in its' utilization. Eight hundred and thirty two teachers and professors completed the 35-question SoCQ, and the results were correlated in a fashion that they had expected when designing the experimental models (see Figure 8). Hall and George refer to the data as displaying a simplex pattern; scales closer to each other are more related than those at a distance (Hall & George, 1979) aligning with the hypothesized order of the SoCs (see Figure 8).

		Stages					
		1	2	3	4	5	6
Stages	0	0.48	0.39	0.13	-0.27	-0.30	-0.16
	1		0.81	0.32	0.19	0.18	0.17
	2			0.47	0.23	0.18	0.25
	3				0.24	0.12	0.37
	4					0.58	0.57
	5						0.59

Figure 8. Intercorrelation of 35 item Stages of Concern questionnaire scale scores (Hall & George, 1979, p. 15)

Data Collection Procedures

Permissions. The researcher submitted a request to the Institutional Review Board (IRB) of the University of Alabama to receive permission to complete this study. The researcher also sought permission from the SEDL to use the SoCQ. Both provided approval to the study (see Appendix A).

The primary researcher made changes to the original IRB application following a low response rate. The changes included modifications to the recruitment strategy, content of recruitment materials, and wording to the consent document to allow an additional contact with non-participants. A change request was submitted to the IRB of the University of Alabama who approved the changes and gave the primary investigator permission to pursue additional contact with non-respondents.

In addition, the unique design of the survey and request of SEDL to house the instrument also led to recruitment issues. The appearance of the instructional media and instructional design versions of SoCQ may have caused confusion in the subject population and lead to a premature discontinuation of the study. To address this issue the primary investigator asked for permission to contact individuals that did not complete the third and final portion of the instrument. The IRB of the University of Alabama gave the primary investigator permission to contact individuals that did not successfully complete the survey instrument.

Internet administration. The Internet delivery method was chosen over traditional methods to increase convenience, security and privacy. The SEDL also recommended the utilization of the online version of the SoCQ. The electronic version of the SoCQ provided an increased convenience to the respondents and the survey administrator. Respondents were able to complete the survey from any location with an Internet connection and at times convenient to them. The administrator was able to complete the study more efficiently in comparison to typical paper-based versions (Dillman & Bowker, 2001). Security and privacy were also increased by decreasing the number of individuals that interacted with the survey. Individualized invitations ensured that only invited individuals completed the survey.

Internet construction of the survey was completed using the guidelines set forth by the SEDL. The second section of the survey utilized customized questions to ascertain the independent variables of the study: (a) personal demographics (see Table 6), (b) academic demographics (see Table 7), and (c) innovation characteristics (see Table 8). The “innovation” component of the SoCQ was changed to “instructional media” in the third section and “instructional design” in the fourth section of the survey. The online version of the SoCQ was designed by SEDL so that individuals need no more than basic computer skills to complete the survey.

Pilot Study. A pilot study was conducted to evaluate the survey for ease of use by participants. The study was piloted by six individuals with varying backgrounds in ATEPs, including clinical coordinators, ATEPs non-PD faculty, and graduate doctoral assistants affiliated with an ATEP. Participants were given two weeks to complete the pilot survey. Respondents reported that the study took between eight to 19 minutes to complete. The primary researcher used this time frame to establish an approximate amount of time to complete the study of 20 minutes. The initial online links between the three components of the survey instrument were incorrect and navigated respondents away from the instrument. The primary researcher corrected the problem and re-engaged the pilot group. After the correction in navigation, all participants reported no problems with completing the survey. Respondents did not report any further complications in completing the survey.

Solicitation of responses. All correspondences for this survey were completed electronically. All communications were aligned with recommendations by Dillman and Bowker

(2001) and Dillman, Smyth, and Christian (2009). As stated by Dillman et al., a variety of different features can be utilized to increase response rates. The primary researcher used the guidelines set by the group to design a tailored approach to the solicitation of participation. Included in this design were a variety of stimuli used over time to encourage participation. Dillman et al. stated that it is "important to change the look, fell, and content" (p. 33) of subsequent correspondences to transmit a more informal and personal side to the survey that subsequently increases response rates. To address this, the primary researcher crafted five different correspondences for the solicitation of participation (see Appendix B).

Using the recommendations of Dillman (2000, 2009), and de Leeuw et al. (2008) this survey utilized five correspondences: pre-notification, main invitation, two follow-up communications, and a thank you. The pre-notification informed participants of the relevance and legitimacy of the survey. It also prepared the participants for the main invitation, which could be overlooked as spam. Dillman stated that a pre-notification "should be brief, personalized, positively worded, and aimed at building anticipation" (2000, p. 156) for the survey. The main survey invitation provided participants with the necessary information to complete the survey. The text of the main invitation was intended to be short and specific. This correspondence conveyed the purpose of the study, the researchers, and how the participants were selected for this study. Additionally, participants were given the option to contact the primary investigators to opt out of the study. Two follow-up communications served as reminders to non-respondents. The purpose of the follow-up communications was to increase response rates. After respondents completed the study they were directed to a final contact thanking them for their participation in the study. It also provided them with contact information to follow-up with outcomes of the study if they desired to.

The timetable for the different contacts was expedited in comparison to traditional survey mediums. Dillman (2000, 2009) reported that a decreased time interval was necessary due to the characteristics of electronic communication and online surveys. The pre-notification contact was sent out during on the 15th of August 2011. The main invitation contact was sent out on the 22nd of August, 2011 to correspond with the start of the fall semesters at universities and colleges. Follow-up contacts were mailed on August 29, 2011, and the final contact was sent on September 9, 2011.[1]

The approved changes to the original IRB request allowed for two additional contacts. The primary researcher used an additional follow-up correspondence on October 18, 2011 to give non-respondents a chance to complete the survey. A new correspondence was also sent to participants that had not completed the survey instrument in its entirety on that same date. This correspondence was also sent out during the third week of October.

Data Entry and Scoring

Data Entry. After completing the online survey, the respondents selected the submit button and the following actions occurred:

1. The participants were taken to a thank-you page that thanked them for participation in the study.
2. The respondents' answers were stored and maintained in SEDL's database.
3. The pre-notification, main contact, follow-up contacts, and final contact were stored in an Excel spreadsheet that was maintained by the primary researcher.

The primary researcher constructed and maintained an Excel spreadsheet with all information pertaining to the study. Personal identification numbers (PINs) were utilized to maintain the anonymity of the respondents. These PINs also helped expedite the data

[1] All correspondences are located in Appendix C.

management and analysis processes. The spreadsheet provided contact dates, completion dates, demographic information, item-by-item responses to the SoCQ, and the raw scores for each SoC. The complete data source was imported into the Statistical Package for the Social Sciences (SPSS) 19. Non-numerical responses were coded into numerical values for the purpose of analysis. All nominal and ordinal information were coded into numerical values. Interval variables were coded as value ranges and given a numeric representation.

Scoring. The raw scores from the SoCQ were retrieved from SEDL. The raw scores were downloaded into an Excel spreadsheet format to increase compatibility with the study's primary spreadsheet maintained by the primary researcher. SEDL provided the primary investigator with scoring of the instrument. The peak and secondary stage score for each respondent and independent variables were noted and inserted into a separate Excel spreadsheet. The mean scores for each of these seven subscale scores were used for descriptive statistical analysis. In addition, independent variables associated with (a) personal demographics (see Table 6), (b) academic demographics (see Table 7), and (c) innovation characteristics (see Table 8) were utilized for statistical procedures including independent *t*-test, multivariate analysis of variance, and bivariate statistics.

Screening. Following the collection of the data, the dataset was screened for normality. A histogram was constructed for each of the SoCQ measures to observe normality. In addition, the skewness and kurtosis of the data was analyzed. Vogt (1999) defines skewness as being "the degree to which measures or sources are bunched on side of a central tendency and trail out (become pointy, like a skewer) on the other" (p. 267). Skewness of the data was used to identify how evenly the data were distributed. A typical cause of skewness can be related to outliers. Kurtosis was defined by Vogt as being the "shape (degree of peakness) of a curve that is a graphical representation of a frequency distribution" (1999, p. 151). The level of peak or flatness of a distribution displays how the scores fall around the mean of a study. The more peaked a distribution is the more scores that are piled up around the mean.

Homoscedasticity is described by Vogt as being the "homogeneity of variance" (1999, p. 133). Parametric statistical tests assume that data maintain homoscedasticity as violations can challenge the validity of the data. Homoscedasticity is directly related to normality of data; if normality is confirmed, then homoscedasticity should be achieved. Violation of homoscedasticity can lead to an increase in Type I error and an increase in the Type II error rate. To determine homoscedasticity a scatter plot was created and visually inspected to ensure that the data points were distributed equally around a zero point.

The data were analyzed for multicollinearity of the independent variables. Multicollinearity is defined as the phenomenon of two independent variables being highly correlated to each other. Grewal, Cote, and Baumgartner (2004) discussed potential problems with multicollenearity as "inaccurate estimates of coefficents and standard errors as well as inference errors" (p.520). To detect, these researchers suggest the utilization of a correlation matrix. Those variables that were highly correlated were excluded from the study.

Data Analysis

To answer the research questions, descriptive statistics, correlations, independent *t*-tests, MANOVAs, and bivariate statistics were conducted. The dependent variables were acquired from each respondent's instructional media SoC and instructional design SoC (see Table 9) as calculated by SoCQ. The independent variables were (a) personal demographics (see Table 6), (b) academic demographics (see Table 7), and (c) innovation characteristics (see Table 8).

RQ #1. What is the peak SoC for PDs of ATEPs with the innovation of instructional media?

The first research question focused on the determination of the respondents' peak SoC for instructional media. Statistical analysis included the identifying of the descriptive statistics: mean, frequencies, and standard deviations. Descriptive statistics were defined by Vogt as being "procedures for summarizing, organizing, graphing, and, in general, describing quantitative information" (1999, p. 79). The dependent variable of the peak SoC was calculated from the SoCQ utilizing guidelines of George et al.'s (2006) technical manual for the innovation of instructional media. The primary investigator used the scoring matrix (see Figure 9) provided by Hall et al. (1977) to obtain the raw scores for each SoC. The raw scores were then converted using the SoCQ guidelines (George et al., 2006), displayed in Figure 10. The highest percentage was the peak SoC for each PD.

Stage 0		Stage 1		Stage 2		Stage 3		Stage 4		Stage 5		Stage 6	
3	______	6	______	7	______	5	______	1	______	5	______	2	______
12	______	14	______	13	______	8	______	11	______	10	______	9	______
21	______	15	______	17	______	16	______	19	______	18	______	20	______
23	______	26	______	28	______	25	______	24	______	27	______	22	______
30		35		33		34		32		29		31	

Figure 9. Stages of Concern Questionnaire scoring matrix (Hall et al., 1977).

RQ #2. What is the second highest SoC for PDs of ATEPs with the innovation of instructional media?

The second research question focused on the determination of the respondents' secondary peak SoC for instructional media. Statistical analyses were completed identifying the descriptive statistics: mean, frequencies, and standard deviations. The dependent variable of secondary peak SoC was calculated from the SoCQ utilizing guidelines of George et al.'s (2006) technical manual for the innovation of instructional media. The primary investigator used the scoring matrix (Figure 8) provided by Hall et al. (1977) to obtain the raw scores for each SoC. The raw scores were then converted using the SoCQ guidelines (George et al., 2006), displayed in Figure 9. The second highest percentage will be the secondary peak SoC for each PD. Use of first and second highest scores provided insight into the dynamics of concerns. It was expected that the second highest score would be adjacent to the highest. This relationship allowed the investigator to evaluate the general pattern of the data.

Five Item Raw Scale Score	Stage 0	Stage 1	Stage 2	Percentile for Stage 3	Stage 4	Stage 5	Stage 6
0	0	5	5	2	1	1	1
1	1	12	12	5	1	2	2
2	2	16	14	7	1	3	3
3	4	19	17	9	2	3	5
4	7	23	21	11	2	4	6
5	14	27	25	15	3	5	9
6	22	30	28	18	3	7	11
7	31	34	31	23	4	9	14
8	40	37	35	27	5	1	17
9	48	40	39	30	5	12	20
10	55	43	41	34	7	14	22
11	61	46	45	39	8	16	26
12	69	48	48	43	9	19	30
13	75	51	52	47	11	22	34
14	81	54	55	52	13	25	38
15	87	57	57	56	16	28	42
16	91	60	59	60	19	31	47
17	94	63	63	65	221	36	52
18	96	66	67	69	24	40	57
19	97	69	70	73	27	44	60
20	98	72	72	77	30	48	65
21	99	75	76	80	33	52	69
22	99	80	78	83	38	55	73
23	99	84	80	85	43	59	77
24	99	88	83	88	48	64	81
25	99	90	85	90	54	68	84
26	99	91	87	92	59	72	87
27	99	93	89	94	63	76	90
28	99	95	91	95	66	80	92
29	99	96	92	97	71	84	94
30	99	97	94	97	76	88	96
31	99	98	95	98	82	91	97
32	99	99	96	99	86	83	98
33	99	99	96	99	90	95	99
34	99	99	97	99	92	97	99
35	99	99	99	99	96	98	99

Figure 10. Percentile conversion for the SoCQ (Hall et al., 1977).

RQ #3. Are there significant differences between the (a) personal demographics, (b) academic demographics, and (c) innovation characteristics and the SoCs of PDs in ATEPs with the innovation of instructional media?

HO1. There is no significant difference in peak SoC for (a) personal demographics, (b) academic demographics, and (c) innovation characteristics and the SoCs of PDs.

Research question three used multivariate analysis to focus on statistical differences between the dependent variable of peak SoC and each of the independent variables: (a) personal demographics, (b) academic demographics, and (c) innovation characteristics. The analysis included the means and standard deviations for the dependent and independent variables. Eleven MANOVAs were conducted to compare the means of each of the independent variables. Tabachnick and Fidell (1996) concluded that MANOVAs are more powerful than separate ANOVAs due to the consideration of the impact of the independent variable on a collection of dependent variables. Factorial MANOVAs were not completed because the number of subjects in this study was insufficient to meet the requirements for that type of procedure. The assumptions of linearity, homogeneity of variance-covariance (Box's M statistic of $p > .001$ used due to unequal sample sizes) and normality were met. To determine statistical significance the Wilks Lambda statistic was used. Significance was determined at the 0.05 level. Follow-up one-way analysis of variance (ANOVA) was completed on each MANOVA procedure that demonstrated statistical significant relationships between the independent variables and the dependent variables. The ANOVAs were used to determine statistically significant differences in the mean.

RQ #4. What is the relationship between (a) personal demographics, (b) academic demographics, and (c) innovation characteristics and the SoCs of PDs in ATEPs with the innovation of instructional media?

HO2. No contributions to a linear composite will be significantly related to the SoCs of PDs in ATEPs with the innovation of instructional media in terms of (a) personal demographics, (b) academic demographics, and (c) innovation characteristics.

To answer RQ4 the primary researcher had intended to utilize logistic regression to analyze the relationships between the dependent variable of PDs' Peak SoC and the independent variables: (a) personal demographics, (b) academic demographics, and (c) innovation characteristics. Dependent variables were reduced to Higher (Stages 4, 5, and 6) and Lower (Stages 0, 1, 2, and 3) after the primary researcher noted a small number of PDs in Stages 2, 3, 4, 5, and 6. A number of other studies have reported their findings utilizing the confines of Higher and Lower Stages (Adams, 2002; Casey & Rakes, 2002; Dobbs, 2004; Hope, 1997; Overbaugh & Lu, 2008; Vaughn, 2002; Sumuer & Yakin, 2007). The alternate classification is based on the combining of Stages 0-2 (Self based concerns) and Stage 3 (Task based concerns) into the new Lower Concerns category. The reclassification resulted in noninterval variables that violated the assumptions of Ordinary Least Squares (OLS) so linear regression could not be completed. The resulting binary dependent variable calls for a logistic regression. However, binary logistic regressions could not be completed due to the sample size. Peduzzi, Concato, Kemper, Holford, and Feinstein (1996) evaluated the effects of events per variable on logistic regression based research. The research found that event values of ten and less can cause both positive and negative bias in the results.

Bivariate statistics were not included in the original research design, but the primary researcher decided to explore the relationship between each of the independent variables and the PDs' Peak SoC. A chi-square test of independence was completed to determine the independence of the independent variables from the bivariate dependent variable of PD's Peak SoC (Higher or Lower Stages).

RQ #5. What is the peak SoC for PDs of ATEPs with the innovation of instructional design?

The fifth research question focused on the determination of the respondents' peak SoC for instructional design. Descriptive statistics (mean, frequencies, and standard deviations) were used for statistical analysis. The dependent variable of the peak SoC was calculated using the same criteria described previously. The highest percentage was the peak SoC for each PD.

RQ #6. What is the second highest SoC for PDs of ATEPs with the innovation of ID?

The sixth research question focused on the determination of the respondents' secondary peak SoC for instructional design. Statistical analyses were completed identifying the descriptive statistics: means, frequencies, and standard deviations. The dependent variable of the secondary peak SoC was calculated utilizing the same procedures as described previously. Again, using the first and second highest scores provided further insight into the dynamics of concerns surrounding instructional design. The second peak SoC was expected to be adjacent to the peak SoC. This relationship allowed the investigator to evaluate the general pattern of the data.

RQ #7. Are there significant differences between the (a) personal demographics, (b) academic demographics, and (c) innovation characteristics, and the SoCs of PDs in ATEPs with the innovation of instructional design?

HO3. There is no significant difference in peak SoC for (a) personal demographics, (b) academic demographics, and (c) innovation characteristics and the SoCs of PDs.

Research question seven used multivariate analysis to focus on statistical differences between the dependent variable of peak SoC and each of the independent variables: (a) personal demographics, (b) academic demographics, and (c) innovation characteristics. The analysis included the means and standard deviations for the dependent variables and independent variables. Eleven MANOVAs will be utilized to compare the means of each of the independent variables. Assumptions of linearity, homogeneity of variance-covariance, and normality were met. The Wilks Lambda statistic was used to determine statistical significance at the 0.05 level. Follow-up one-way analysis of variance (ANOVA) was completed on each MANOVA procedure that demonstrated statistical significant relationships between the independent variables and the dependent variables. The ANOVAs were used to determine statistically significant differences in the mean.

RQ #8. What is the relationship between (a) personal demographics, (b) academic demographics, and (c) innovation characteristics, and the SoCs of PDs in ATEPs with the innovation of ID?

HO4. No contributions to a linear composite will significantly relate to the SoCs of PDs in ATEPs with the innovation of instructional design in terms of (a) personal demographics, (b) academic demographics, and (c) innovation characteristics.

The primary researcher intended to utilize logistic regression to analyze the relationships between the dependent variable of PDs’ Peak SoC and the independent variables: (a) personal demographics, (b) academic demographics, and (c) innovation characteristics to answer RQ#8. Dependent variables were reduced to Higher (Stages 4, 5, and 6) and Lower (Stages 0, 1, 2, and

3) to accommodate for a small number of participants being distributed across the stages. This reclassification resulted in noninterval variables and violates the assumptions of OLS and linear regression could not be completed. The resulting binary dependent variable calls for a logistic regression. However, binary logistic regressions could not be completed due to the sample size of the study.

The primary researcher again decided to utilize bivariate statistics to explore the relationship between each of the independent variables and the PDs' Peak SoC. A chi-square test of independence was completed to determine the independence of the independent variables from the bivariate dependent variable of PD's peak SoC (Higher or Lower Stages).

RQ #9. Is there a significant difference between the peak scores of the individual components of instructional technology, the innovations of instructional media or ID, as identified by PDs of ATEPs?

HO5.

There is no significant difference in the peak score for the innovation of instructional media and the peak score for the innovation of instructional design for PDs.

Research question nine focuses on the statistical difference between the peak SoC for both instructional media and instructional design. The primary investigator analyzed descriptive statistics for both and completed an independent *t*-test. The results will allow the researcher to determine a difference between the peak SoC for PDs.

Limitations of the Study

This study, while designed with intentionality and careful consideration, possesses several limitations. These limitations are based on the use of the survey instrument, study participants, delivery, and design of the study.

Survey instrument. Since this survey-based study was self-administered, there is potential for bias on the part of the respondent. Also, the primary researcher recognizes that there was potential for possible misrepresentation of the respondents' utilization of instructional technology. The survey only evaluated PDs in ATEPs and this factor may have led to limited results regarding the utilization of instructional technology since it did not evaluate the opinions of students and administrators.

The construct of the SoCQ also contributed to the potential limitations of this study. The SoCQ is designed to allow a quick and easy diagnostic of PDs' concerns. However, it is not designed to provide respondents the opportunity to respond with additional information to the survey instrument. It is designed using closed questions and does not provide the opportunity for explanation on respondent choices. The survey also does not allow for respondents to ask specific questions about the instrument itself, which could lead to misinterpretation of questions and impact the overall results of the study.

Design of the study. Limitations of this study can also be attributed to the fact it was a cross-sectional study. This type of research is conducted at one specific time and does not fully represent the views of the participants over a continuum.

The utilization of two unique SoCQ also limited the results of this study. Southwest Educational Development Laboratory required the utilization of their online SoCQ platform for both innovations. The only difference between the two sections was the "innovation" placeholder, instructional media in the first and instructional design in the second. The delivery of the two SoCQ in succession could have led to confusion and early termination of the survey by respondents that did not recognize differences in the SoCQ.

Participants. The results of the survey could also be limited by personal conflicts that may arise during the administration of the survey. There was no attempt by the primary investigator to control the physical or mental states of the participants and or the environment in which the survey was administered.

Chapter Summary

This chapter described the methodology that the primary researcher used in this study. The study employed a cross-sectional survey design investigating PDs at 367 CAATE accredited undergraduate and post certification level ATEPs. The subject response rate was 15.5%. The instrument used was a modified version of the SoCQ portion of the CBAM. The SoC for instructional media and instructional design served as the dependent variables. The independent variables were (a) personal demographics (see Table 6), (b) academic demographics (see Table 7), and (c) innovation characteristics (see Table 8). Statistical analyses were conduct to determine significance between means of the various levels of the independent variables. Descriptive statistics were evaluated for all nine of the research questions. MANOVAs were completed on RQ#3 and RQ#7. In order to accurately evaluate for significance for research questions two and four, a Tukey post hoc analysis was conducted. Chi-square tests of independence were completed to determine the independence of the independent variables from the bivariate dependent variable in RQ#4 and RQ#8. This analysis provided the primary researcher the ability to determine relationships between the data. Research question nine was addressed utilizing a *t*-test to examine differences between the SoC for instructional media and instructional design.

CHAPTER 4

RESULTS

This study examined program directors' (PDs) concerns with instructional technology by investigating the innovations of instructional media and instructional design. It employed the Stage of Concerns Questionnaire (SoCQ; George et al., 2006) to determine PDs Stage of Concern (SoC) with each of the innovations. Demographic data were also collected in the following subcategories: (a) personal demographics, (b) academic demographics, and (c) innovation characteristics. This chapter presents the research findings.

Sample

The final sample in this study consisted of 57 program directors at CAATE accredited institutions. These respondents were drawn from a population of 326 directors; 130 agreed to participate yielding an assumed response rate of 39.8%. Of the 130 agreed participants, 73 surveys were incomplete. However, 109 of the respondents submitted enough information to describe the use of SoCQ for instructional media and 66 for the SoCQ for instructional design. The final 57 respondents who provided completed surveys and upon whom most of the inferential analysis is based represented a completed response rate of 17.5% of the pool of 326 directors.

Demographic Data

Participants were asked during the survey to provide three types of demographic information: personal, academic, and technology. Personal demographics were represented as gender and age. The personal demographics are displayed in Table 14 accounting for both actual responses and bivariate composites of the responses. Academic demographics included the following: tenure status, academic rank, advanced degree, average course load, teaching experience, and Basic Carnegie level of the participants. The responses and bivariate composites of the responses for academic demographics are reported in Table 15. Technology based demographics included: definition of instructional technology, level of experience with instructional media, level of experience with instructional design, prior training in instructional media, and prior training in instructional design. Table 16 displays the technology demographics in both actual responses and bivariate composites of the responses.

Table 14
Personal Demographics of Respondents

Characteristics	N	%
Gender		
Female	30	52.6
Male	27	47.4
Age		
30-39 years old	22	38.6
40-49 years old	23	40.4
50 years old and older	12	21.1
Age (Bivariate)		
30-39 years old	22	38.6
40 years old and older	35	61.4

A correlation matrix was constructed using Pearsons Product Movement to assess multicollinearity. The purpose for the procedure was to determine the strength of linear dependence between the independent variables (personal, academic, and technology demographics) and exclude redundancy from the study. The Pearson’s r was calculated for the independent variables assessing personal and academic demographics. The results are displayed in Table 17. The statistical procedure found a positive correlation between Teaching Experience and Age, $r = .784$, $n = 57$, $p = .000$. This strong positive correlation indicates that age increases

Table 15
Academic Demographics of Respondents

Characteristics	N	%
Tenure		
Clinical or Non-Tenure	16	28.1
Tenure-Track	20	35.1
Tenured	21	36.8
Tenure (Bivariate)		
Clinical or Non-Tenure	16	28.1
Tenure-Track or Tenured	41	71.9
Highest Degree		
Non-terminal Degree	24	42.1
Terminal Degree	33	57.9
Average Course Load		
10-12 hours per semester	20	35.1
7-9 hours per semester	20	35.1
0-6 hours per semester	17	29.8
Average Course Load (Bivariate)		
7-12 hours per semester	40	70.2
0-6 hours per semester	17	29.8
Basic Carnegie Level		
Bachelor's Granting	10	17.5
Master's Granting	31	54.4
Doctorate Granting	16	28.1
Basic Carnegie Level (Bivariate)		
Bachelor's or Master's Granting	41	71.9
Doctorate Granting	16	28.1

Table 16
Innovation Characteristics of Respondents

Characteristics	N	%
Definition of Instructional Technology		
Tools (Instructional Media)	9	15.8
Process (Instructional Design)	5	8.8
Tools and Process (Instructional Technology)	43	75.4
Definition of Instructional Technology (Bivariate)		
Tools (Instructional Media) or Process (Instructional Design)	14	24.6
Tools and Process (Instructional Technology)	43	75.4
Level of Experience with Instructional Media		
Non-user or Novice	5	8.8
Intermediate	32	56.1
Experienced	20	35.1
Level of Experience with Instructional Media (Bivariate)		
Non-user or Novice	5	8.8
Intermediate or Experienced	52	91.2
Prior Training in Instructional Media		
Yes	54	97.7
No	3	5.3
Level of Experience with Instructional Design		
Non-user or Novice	20	35.1
Intermediate	25	43.9
Experienced	12	21.1
Level of Experience with Instructional Design (Bivariate)		
Non-user or Novice	20	35.1
Intermediate or Experienced	37	64.9
Prior Training in Instructional Design		
Yes	43	75.4
No	14	24.6

similarly as teaching experience. The primary researcher decided to exclude teaching experience form the study as it can be explained by Age.

Table 17
Pearson Correlation Matrix Among Independent Variables

	Sex	Tenure	Academic Rank	Course Load	Teaching Experience	Carnegie Level	Degree
Age	-.12	.433*	.450*	.072	.784*	-.138	.132
Sex		-.060	.265	.150	.120	-.202	.097
Tenure			.528*	-.184	.409*	-.083	.404*
Academic Rank				.029	.515*	.021	.499*
Course Load					.097	.337	.298
Teaching Experience						-.138	.234
Carnegie Level							.348*

*$p < 0.01$

Survey Instrument

Internal reliability. The primary investigator determined internal reliability by using SPSS to calculate Cronbach's alpha. A higher value for the Cronbach's alpha supports that a certain grouping of items measure an underlying construct. DeVellis (1991) reports that alpha's between .70 and .80 are respectable while alphas of .60 to .70 are minimally acceptable. Table 18 depicts the Cronbach's alpha for both instruments in this study. Stage 6 of the Instructional Media SoCQ cronbach's alpha was .59 and considered unacceptable on DeVellis' (1991) scale. This result is similar to research completed by Jibaja-Rusth et al. (1991) on a population of 22 respondents with cronbach's alpha of .54 on Stage 6. The internal reliabilities of all the other stages were consistent with previous research and acceptable using DeVillis' (1991) criteria.

Data Analysis

Program directors stage of concern with instructional media. Part of this research was intended to determine the peak Stages of Concern (SoC) and second highest SoC for the respondents in regard to the use of instructional media. Frequency counts were made to determine the peak and secondary peak SoC of PDs and the results were used to answer the following two research questions.

Table 18
Coefficients of Internal Reliability for Each Stage of Concern

		Subscale						
Study	N	Stage 0 (N = 5)	Stage 1 (N = 5)	Stage 2 (N = 5)	Stage 3 (N = 5)	Stage 4 (N = 5)	Stage 5 (N = 5)	Stage 6 (N = 5)
Hall et al., 1979	830	.64	.78	.83	.75	.76	.82	.71
Kolb, 1983	718	.75	.87	.72	.84	.79	.81	.82
Jordan-Marsch, 1985	214	.50	.78	.77	.82	.77	.81	.65
Jibaja-Rusth et al., 1991	22	.12	.48	.78	.86	.88	.61	.54
Bailey & Palsha, 1992	142	.42	.67	.77	.64	.79	.77	.61
Instructional Media SoCQ	57	.636	.671	.812	.662	.741	.861	.590
Instructional Design SoCQ	57	.768	.768	.807	.796	.817	.860	.764

RQ#1. What is the peak SoC for PDs of ATEPs with the innovation of instructional media?

To address RQ#1, respondents were asked to complete the SoCQ for the innovation of instructional media. The SoCQ consist of 35 items that represent possible concerns that respondents may experience. Each respondent marks each item on a scale of zero (irrelevant) to seven (very true) as it related to him or her. The 35 questions are categorized into seven SoCs: (a) unconcerned, (b) informational, (c) personal, (d) management, (e) consequence, (f) collaboration and (g) refocusing (Hall et al., 1986).[2] The SoC were provided by SEDL and verified through calculations completed using Microsoft Excel.

The means, standard deviation, and ranges of SoC were calculated for the entire sample. The highest mean score for the sample was the consequences stage (Stage 4; M = 21.53, SD = 6.03). The second highest mean score for the sample was located on collaboration (Stage 6; M =

[2] Table 5 includes the questions that compromise each stage.

18.68, SD = 7.49). The means, standard deviation, and range for all seven SoC are reported in Table 19.

Table 19
Mean Stage of Concern Scores for all Respondents for the Innovation of Instructional Media

Stage of Concern	*N*	*M*	*SD*	*Range*
Unconcerned (stage 0)	57	14.12	5.38	4 to 27 (23)
Informational (stage 1)	57	18.72	5.73	7 to 30 (23)
Personal (stage 2)	57	16.95	7.58	2 to 31 (29)
Management (stage 3)	57	17.89	6.43	3 to 29 (26)
Consequences (stage 4)	57	21.53	6.03	9 to 34 (25)
Collaboration (stage 5)	57	18.68	7.49	5 to 35 (30)
Refocusing (stage 6)	57	17.93	4.97	5 to 31 (26)

SoCQ data were analyzed by means of identifying the peak SoC for each individual. The interpretation of the peak score was determined by looking at the frequency of the highest percentile score, which indicates the relative intensity of each stage (George et al., 2006), of each respondent. Peak scores are not absolute rather they are relative to the other scores for each respondent. SPSS was utilized to analyze the frequency of respondents with peak scores in each of the SoC. Table 20 displays the peak scores for the sample. The peak SoC for the largest percent of responders (54.4%) was unconcerned (Stage 0). The next largest percent of responders (14.0%) was management (Stage 3).

Table 20
Frequency of Peak Stage of Concern for Program Directors for the Innovation of Instructional Media

	Peak Stage of Concern							
	0	1	2	3	4	5	6	Total
N	31	5	6	8	1	5	1	57
%	54.4	8.8	10.5	14.0	1.8	8.8	1.8	100

RQ#2. What is the second highest SoC for PDs of ATEPs with the innovation of instructional media?

The second highest SoC can be used along with the highest concern stage to develop further insight into the dynamics of a group concerns (George et al., 2006). In typical situations the secondary peak SoC will be adjacent to the peak SoC. This relationship is based on the developmental nature of concerns. SPSS was utilized to analyze the frequency of respondents with peak scores and secondary peak scores in each of the SoC. Table 21 cross-tabulates each individual's highest and second highest SoC. A majority, 54.4% of respondents (N = 31), fall in the unconcerned (Stage 0) with a 39.8% of those respondents (N = 18) displaying a secondary high concern of informational (Stage 1).

Table 21
Percent Distribution of Second Highest Stage of Concern in Relation to Peak Stage of Concern of Program Directors for the Innovation of Instructional Media

Peak Stage of	Second Highest Stage of Concern								
Concern	0	1	2	3	4	5	6	Row %	N
0 Unconcerned	0	18	4	7	0	0	2	54.4	31
1 Informational	1	0	2	0	2	0	0	8.8	5
2 Personal	1	2	3	0	0	0	0	10.5	6
3 Management	2	2	2	0	0	0	2	14.0	8
4 Consequence	0	0	0	0	0	1	0	1.8	1
5 Collaboration	0	2	1	0	1	0	1	8.8	5
6 Refocusing	0	1	0	0	0	0	0	1.8	1
								Total	57

An additional part of this research was intended to complete hypothesis testing on the differences and relationships between personal, academic, and innovation characteristics. Multivariate analysis and chi squares were conducted and the data were used to answer the following two research questions about the innovation of instructional media.

RQ#3. Are there significant differences between the (a) personal demographics, (b) academic demographics, and (c) innovation characteristics and the SoCs of PDs in ATEPs with the innovation of instructional media?

HO1. There is no significant difference in peak SoC for (a) personal demographics, (b) academic demographics, and (c) innovation characteristics and the SoCs of PDs.

To answer RQ#3 MANOVA procedures were completed to determine if there was a statistically significant difference in SoCs and (a) personal demographics, (b) academic demographics, and (c) innovation characteristics and the SoCs of PDs. Tabachnick and Fidell (1996) concluded that MANOVAs are more powerful than separate ANOVAs because of the impact of the independent variable on a collection of dependent variables. Factorial MANOVAs were not completed because the number of subjects in this study was insufficient to meet the requirements for this type of procedure. The assumptions of linearity, homogeneity of variance-covariance (Box's M statistic of $p > .001$ used due to unequal sample sizes), and normality were met.

To determine statistical significance, the Wilks Lambda statistic was used. Significance was determined at the 0.05 level. MANOVAs producing statistical significance resulted in a subsequent one-way analysis of variance (ANOVA) being completed. The ANOVA examined whether mean differences were statistically significant.

The primary researcher used the raw scores for each of the seven SoCs. George et al. (2006) recommend the use of the raw scores in statistical analysis over the percentile scores. Each of the scores was entered into SPSS as subject scores for each of the SoC (dependent variables). The tests of significance were then applied.

The main effect of age did not yield statistical significance $F(14,96) = 1.253$; Wilks γ ratio of $F = 1.253$, $p = 0.252$, η^2 0.154. This statistic indicates that no statistical significance exists between age groups of 30-39 years old, 40-49 years old and 50 years old and above, that is, age was not a predictor of the SoC. Follow-up ANOVAs were not needed. Mean percentile comparisons based upon age are displayed in Figure 11.

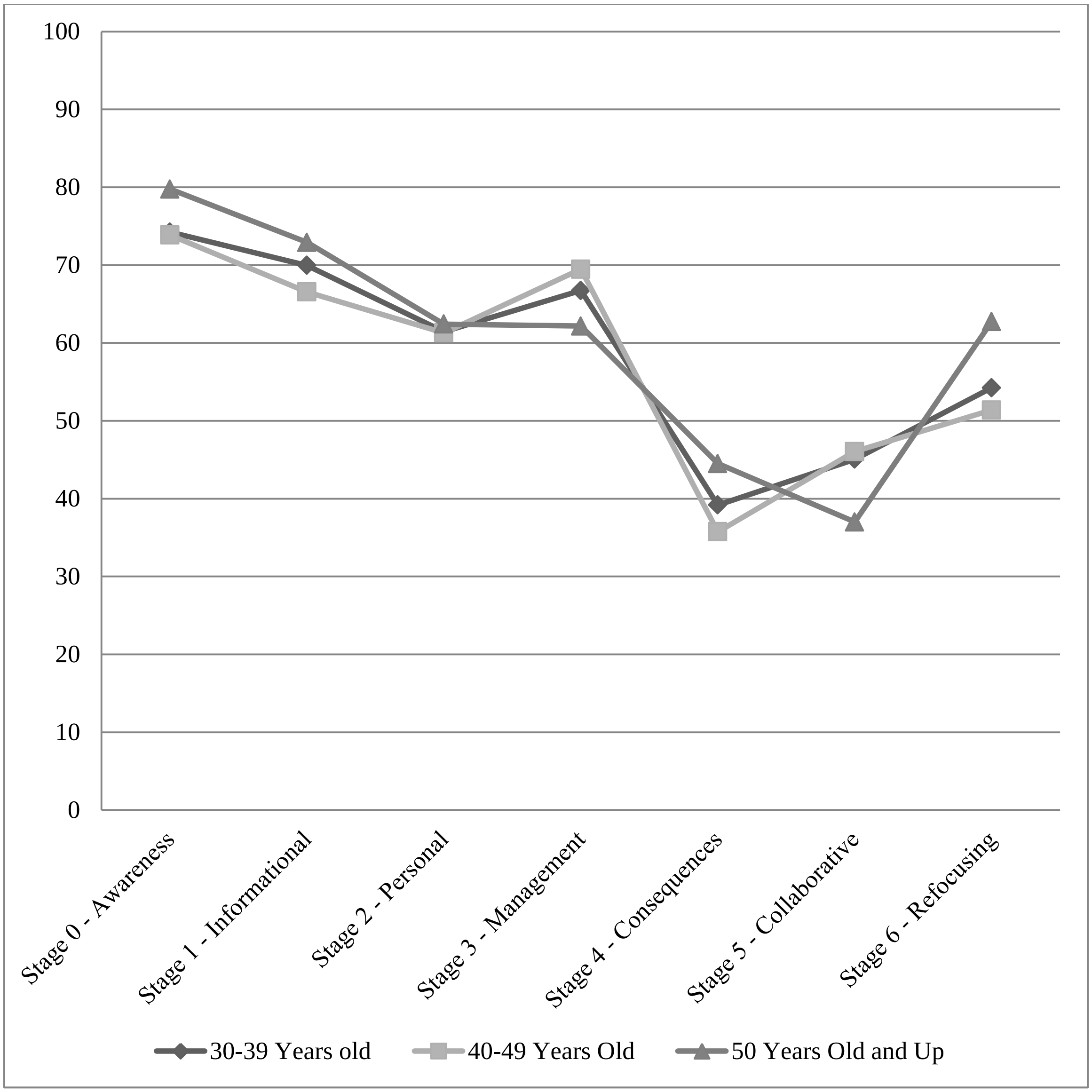


Figure 11. Mean percentile Stage of Concern Scores for instructional media comparison by age.

The main effect of sex did not yield statistical significance $F(14,96) = .718$; Wilks γ ratio of F = .718, $p = 0.657$, η^2 0.093. This statistic indicates that no statistical significance exists between females and males, that is, sex of respondent was not related to SoC. Follow-up

ANOVAs were not needed. Mean percentile comparisons based upon gender are displayed in Figure 12.

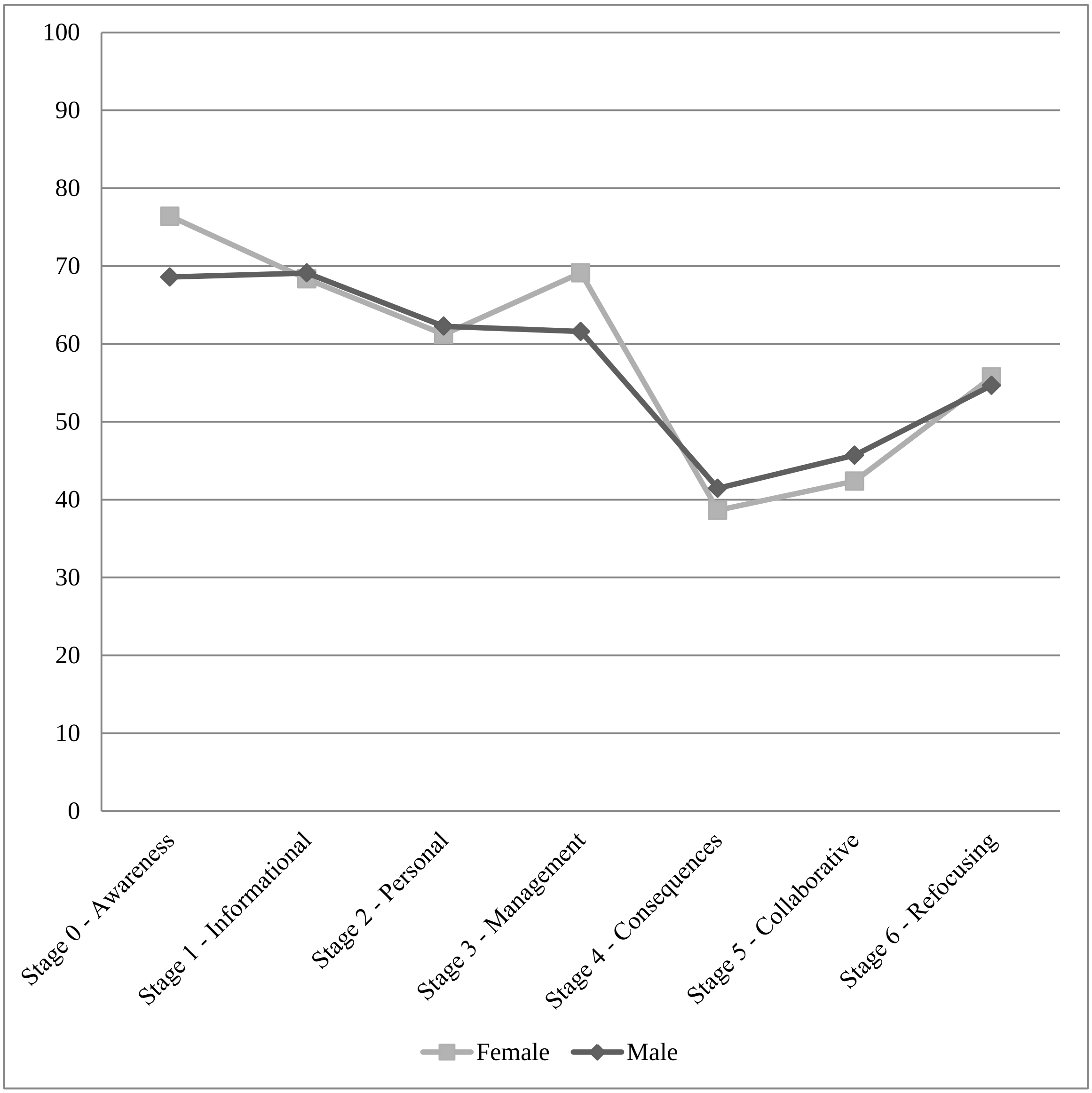


Figure 12. Mean percentile Stage of Concern scores for instructional media comparison by gender.

The main effect of tenure did not yield statistical significance $F(14,96) = .692$; Wilks γ ratio of $F = .692$, $p = 0.777$, η^2 0.092. Clinical or non-tenure, tenure track, or tenured status of PDs was not related to SoC. Follow-up ANOVAs were not needed. Mean percentile comparisons based upon level of tenure are displayed in Figure 13.

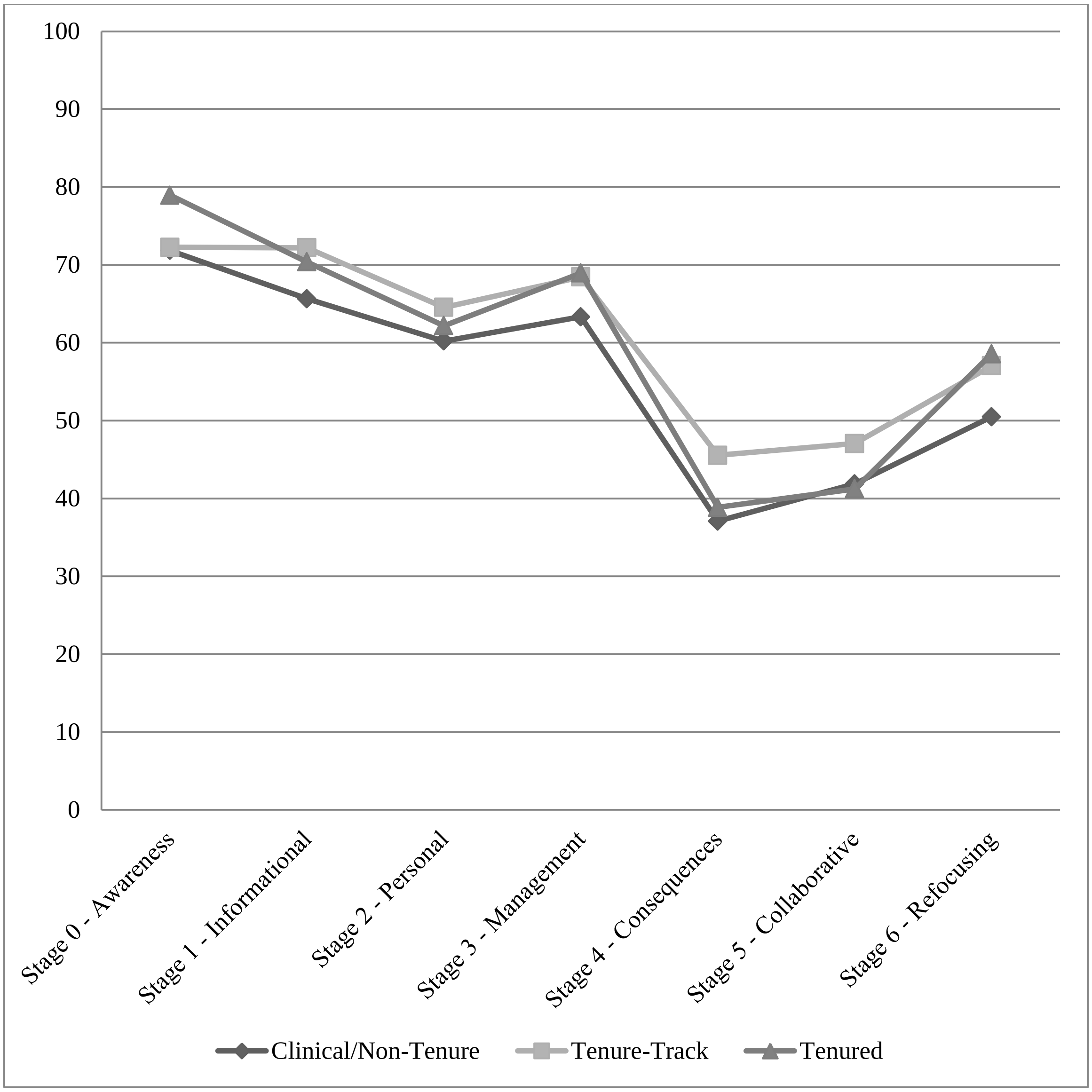


Figure 13. Mean percentile Stage of Concern scores comparison by level of tenure for instructional media.

The main effect of degree did not yield statistical significance $F(14,96) = .876$; Wilks γ ratio of $F = .876$, $p = 0.532$, η^2 0.111. Possessing a terminal degree versus a non-terminal degree was not a predictor of SoC. Follow-up ANOVAs were not needed. Mean percentile comparisons based upon highest earned degree are displayed in Figure 14.

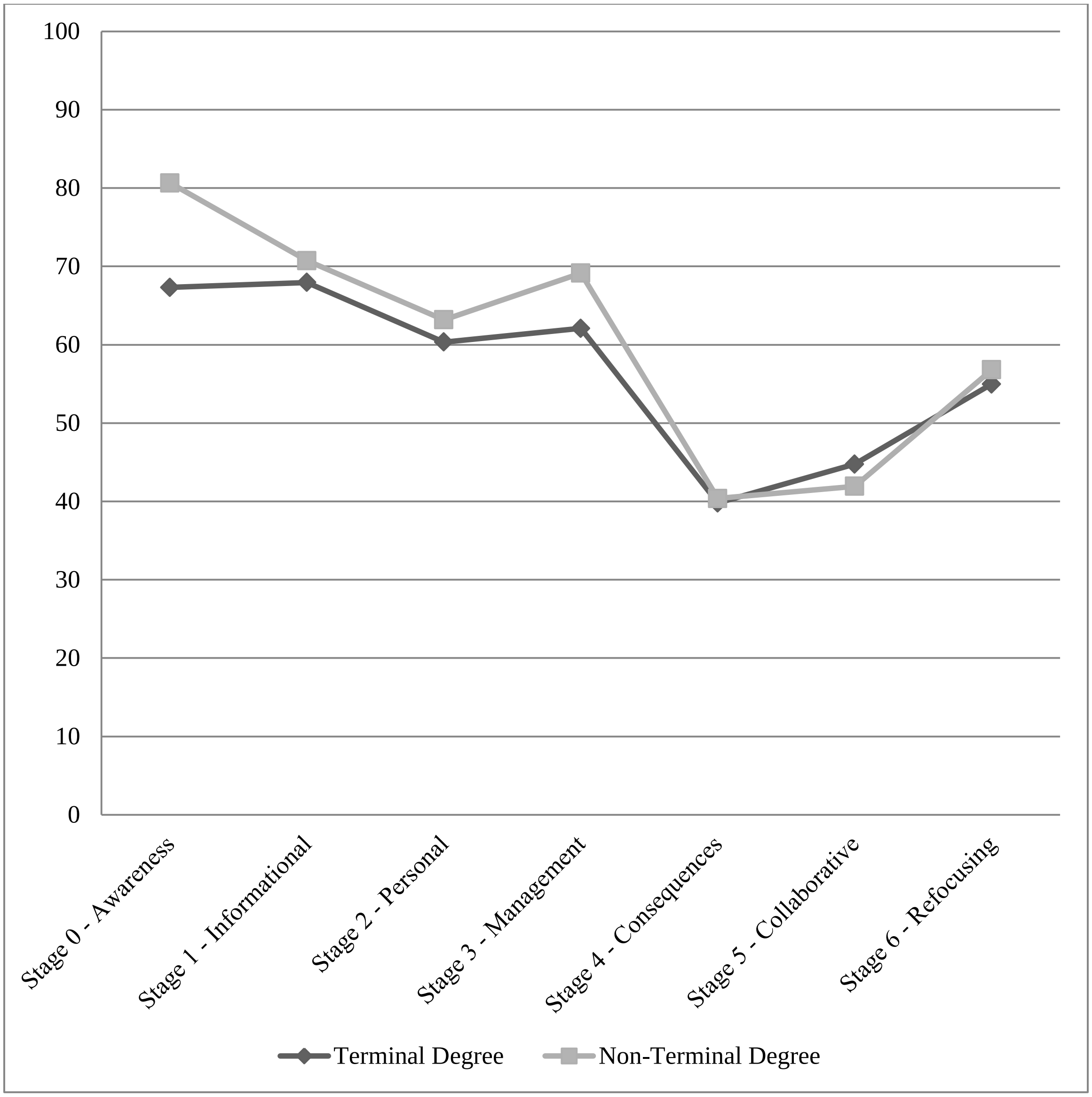


Figure 14. Mean percentile Stage of Concern scores for instructional media comparison by highest earned degree.

The main effect of course load did not yield statistical significance $F(14,96) = .745$; Wilks γ ratio of F = .745, $p = 0.724$, η^2 0.098. Course loads of 0-6 credit hours, 7-9 credit hours, and 10-12 credit hours of PDs were not related to SoC. Follow-up ANOVAs were not needed. Mean percentile comparisons based upon course load are displayed in Figure 15.

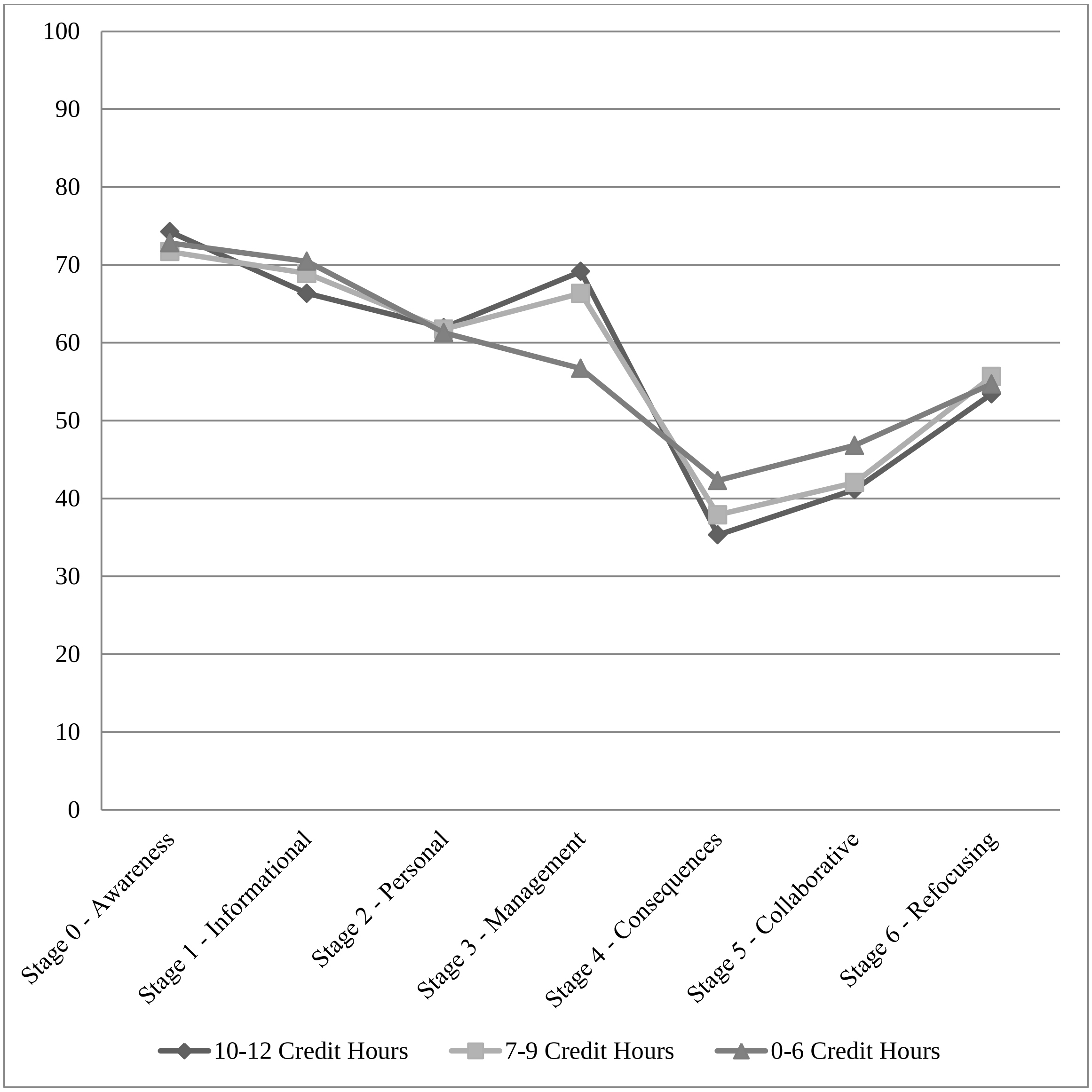


Figure 15. Mean percentile Stage of Concern scores for instructional media comparison by course load.

The main effect of an institution's basic Carnegie level did not yield statistical significance F (14,96) = .728; Wilks γ ratio of F = .728, p = 0.741, η^2 0.096. Basic Carnegie levels of bachelors granting, masters granting, and doctoral granting were not predictors of SoC for PDs. Follow-up ANOVAs were not needed. Mean percentile comparisons based upon Basic Carnegie Level are displayed in Figure 16.

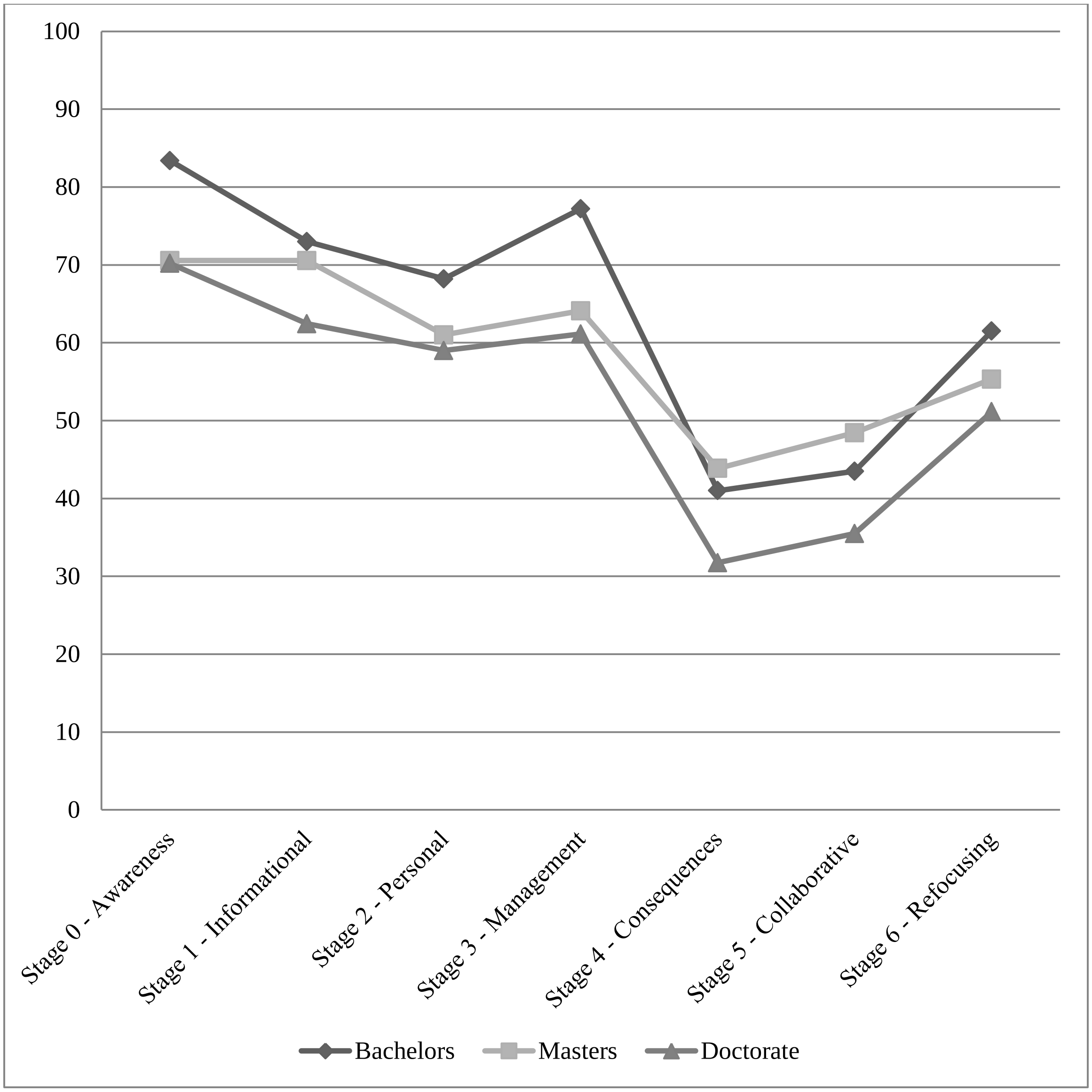


Figure 16. Mean percentile Stage of Concern scores for instructional media comparison by basic Carnegie level.

The main effect of definition did not yield statistical significance $F(14,96) = 1.635$; Wilks γ ratio of $F = 1.635$, $p = 0.083$, η^2 0.209. PDs definition of instructional technology (instructional media, instructional design, and instructional technology) was not related to the SoC. Follow-up ANOVAs were not needed. Mean percentile comparisons based upon definition are displayed in Figure 17.

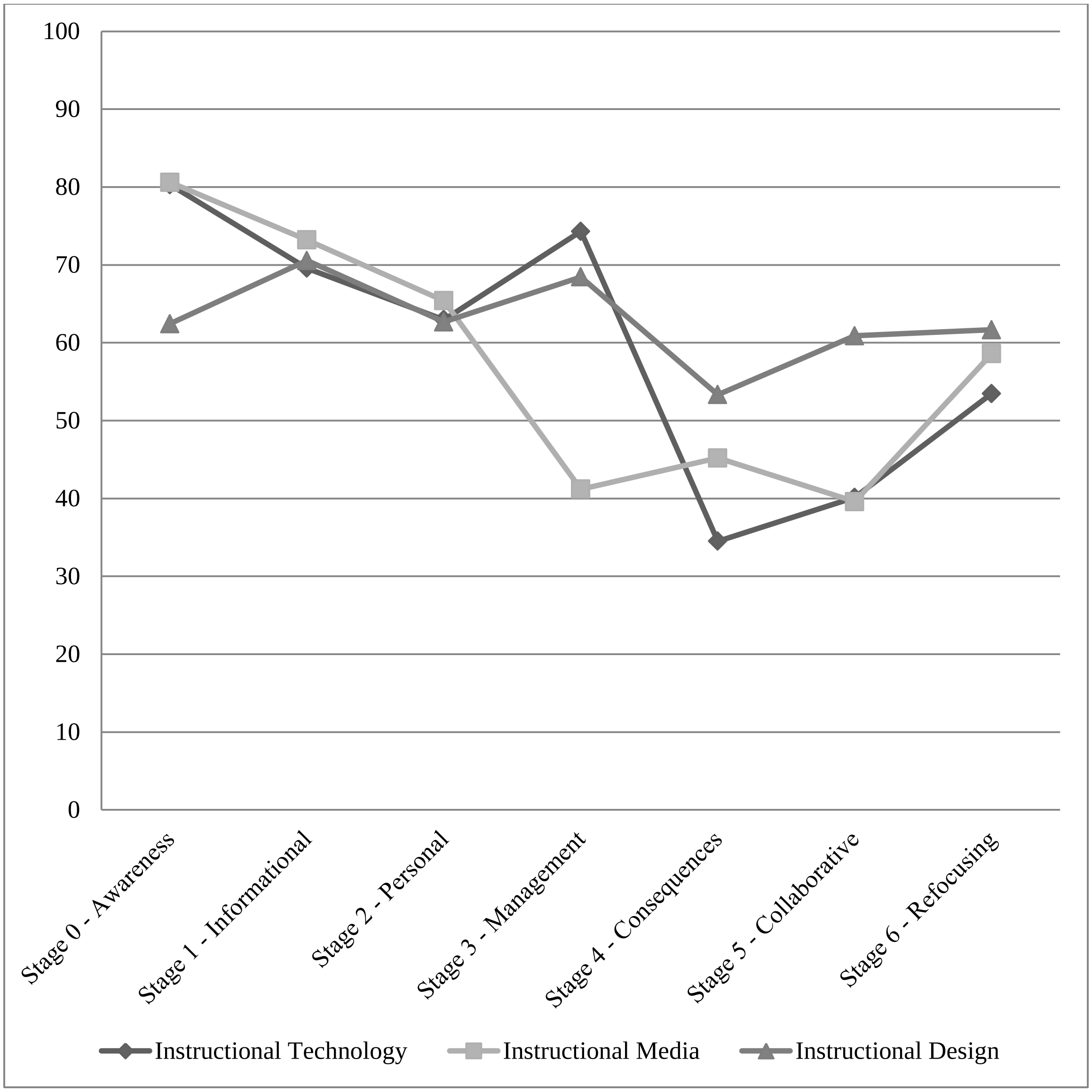


Figure 17. Mean percentile Stage of Concern scores for instructional media comparison by definition of instructional technology.

The main effect of self-identified expertise did not yield statistical significance $F(14,96) = 1.403$; Wilks γ ratio of F = 1.403, $p = 0.167$, η^2 0.170. PDs self-identification as being novice or non-users, intermediate users, or experienced users was not related to SoC. Follow-up ANOVAs were not needed. Mean percentile comparisons based upon self-identified expertise are displayed in Figure 18.

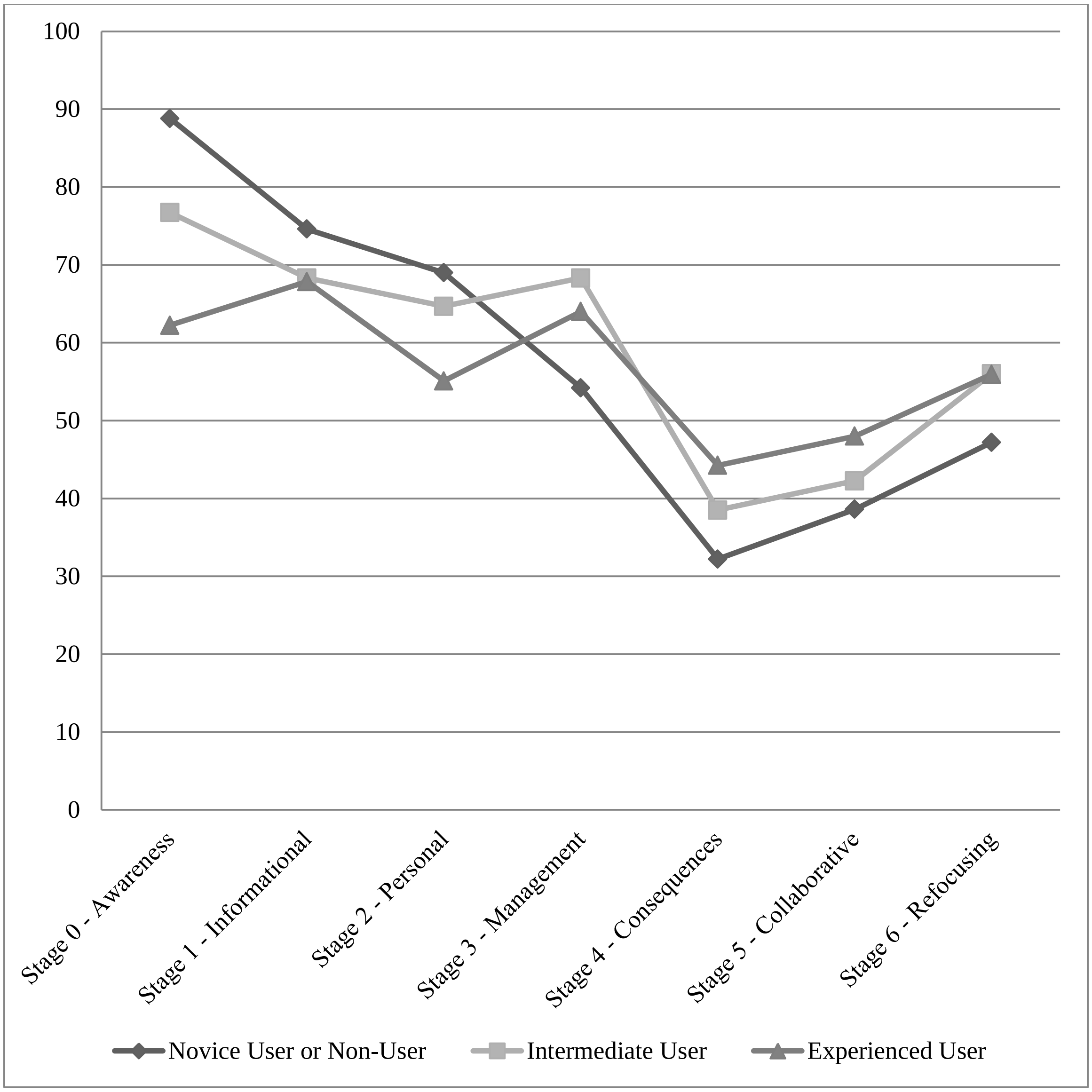


Figure 18. Mean percentile Stage of Concern scores for instructional media comparison by self-identified expertise.

RQ #4. What is the relationship between (a) personal demographics, (b) academic demographics, and (c) innovation characteristics and the SoCs of PDs in ATEPs with the innovation of instructional media?

HO2. No contributions to a linear composite will be significantly related to the SoCs of PDs in ATEPs with the innovation of instructional media in terms of (a) personal demographics, (b) academic demographics, and (c) innovation characteristics.

To answer RQ#4 multinomial logistic regression and binary logistic regressions were not used due to the sample size. Peduzzi et al.'s (1996) research evaluated the effects of events per variable in logistic models. The research found that values of 10 and less can attributed to bias in the results in both a positive and negative direction. To accommodate for low event rates in the dependent variables of all of the SoCs except for Stage 0, the primary researcher converted all data into bivariate categories (see Tables 6, 7, and 8). The conversion of the SoC to High (Stages 4-6) and Low (Stages 0-3) bivariate categories (see Table 22) did not produce enough events to allow for a binary regression to be used without producing bias in the results.

Table 22
Frequency of Low (Stage of Concerns 0-3) and High (Stage of Concerns 4-6) for Program Directors and the Innovation of Instructional Media

	Highest Stage of Concern		
	Low (0-3)	High(4-6)	Total
N	50	7	57
%	87.7	12.3	100

Bivariate statistics were not included in the original research design but it was decided to explore the relationship between each of the independent variables and the PDs' Peak SoC. A chi-square test of independence was completed to determine the independence of the independent variables from the bivariate dependent variable of PD's peak SoC (high or low).

A Pearson's chi-square was used to examine the difference in distribution between age and PD's Peak SoC (bivariate categories of High, Stages 4-6, and Low, Stages 0-3). The sample included 22 respondents who were 30-39 years old and 35 who were 40 years old and up. No significant relationship was found, χ^2 (1, N = 57) = 0.61, p = .805. Age appears to not be related to PD's peak SoC.

A Pearson's chi-square was used to examine the difference in distribution between gender and PD's peak SoC (bivariate categories of High, Stages 4-6, and Low, Stages 0-3). The sample included 30 respondents who were female and 27 were male. No significant relationship was found, χ^2 (1, N = 57) = 1.853, p = .173. Gender did not appear to be related to PD's peak SoC.

A Pearson's chi-square was used to examine the difference in distribution between tenure status and PD's peak SoC (bivariate categories of High, Stages 4-6, and Low, Stages 0-3). The sample included 16 respondents were non-tenure track or clinical faculty and 41 were tenured or tenured tracked. No significant relationship was found, χ^2 (1, N = 57) = .864, p = .353. Tenure status appears to not be related to PD's peak SoC.

A Pearson's chi-square was used to examine the difference in distribution between highest earned degree and PD's peak SoC (bivariate categories of High, Stages 4-6, and Low, Stages 0-3). The sample included 24 respondents with non-terminal degrees and 33 individuals with terminal degrees. No significant relationship was found, χ^2 (1, N = 57) =.002, p = .966. Highest earned degree appears to not be related to PD's peak SoC.

A Pearson's chi-square was used to examine the difference in distribution between course load and PD's peak SoC (bivariate categories of High, Stages 4-6, and Low, Stages 0-3). The sample included 40 respondents who were instructing 7-12 credit hours and 17 who were instructing 0-6 credit hours. No significant relationship was found, χ^2 (1, N = 57) = 2.845, p = .092. Course load appears to not be related to PD's peak SoC.

A Pearson's chi-square was used to examine the difference in distribution between an institution's basic Carnegie level and PD's peak SoC (bivariate categories of High, Stages 4-6, and Low, Stages 0-3). The sample included 41 respondents were from bachelor's or master's granting institutions and 16 were from doctoral granting institutions. No significant relationship was found, χ^2 (1, N = 57) = .751, p = .386. An institution's basic Carnegie level appears to not be related to PD's peak SoC.

A Pearson's chi-square was used to examine the difference in distribution between respondent's definition of instructional technology and PD's peak SoC (bivariate categories of High, Stages 4-6, and Low, Stages 0-3). The sample included 14 respondents identified with a definition of instructional media or instructional design and 43 identified with the definition of instructional technology. No significant relationship was found, χ^2 (1, N = 57) = .1.442, p = .230. Definition of instructional technology status did not appear to be related to PD's peak SoC.

A Pearson's chi-square was used to examine the difference in distribution between self-reported level of use and PD's peak SoC (bivariate categories of High, Stages 4-6, and Low, Stages 0-3). The sample included five respondents identified as non-user or inexperienced while 52 identified as intermediate or experienced users. No significant relationship was found, χ^2 (1, N = 57) = .767, p = .381. Self-reported level of use appears to not be related to PD's peak SoC.

Program directors stage of concern with instructional design. Part of this research was intended to determine the peak Stages of Concern (SoC) and Secondary Peak SoC for the respondents with respect to the use of instructional design. Frequency counts were made to determine the peak and secondary peak SoC PDs made and the data were used to answer to following two research questions.

RQ #5: What is the peak SoC for PDs of ATEPs with the innovation of instructional design?

To address RQ5, respondents were asked to complete the SoCQ for the innovation of instructional design. The SoCQ consist of 35 items that represent possible concerns that respondents may experience. Each respondent marks each item on a scale of zero (irrelevant) to seven (very true) as it related to him or her. The 35 questions are categorized into seven SoCs: (a) unconcerned, (b) informational, (c) personal, (d) management, (e) consequence, (f) collaboration, and (g) refocusing (Hall et al., 1986).[3] The SoC scores were calculated using Microsoft Excel.

The means, standard deviations, and ranges of SoC were calculated for the entire sample. The highest mean score for the sample was the informational stage (stage 1; M = 19.28, SD = 6.57). The second highest mean score was located on the management stage (Stage 2; M = 18.72, SD = 6.93). The means, standard deviation, and range for all seven SoC are reported in Table 23.

Table 23
Mean Stage of Concern Scores for all Respondents for the Innovation of Instructional Design

Stage of Concern	N	Mean	SD	Range
Unconcerned (Stage 0)	57	16.68	6.96	2 to 34 (32)
Informational (Stage 1)	57	19.28	6.57	3 to 33 (30)
Personal (Stage 2)	57	17.72	6.86	5 to 33 (31)
Management (Stage 3)	57	18.72	6.93	5 to 35 (30)
Consequences (Stage 4)	57	17.21	6.33	5 to 32 (27)
Collaboration (Stage 5)	57	16.28	7.23	5 to 35 (30)
Refocusing (Stage 6)	57	15.00	6.11	2 to 28 (26)

SoCQ data was analyzed by means of identifying the peak SoC for each individual. The interpretation of the peak score was determined by looking at the frequency of the highest percentile score, which indicates the relative intensity of each stage (George et al., 2006), of each respondent. Peak scores are not absolute rather they are relative to the other scores for each respondent. SPSS was utilized to analyze the frequency of respondents with peak scores in each of the SoC. Table 24 displays the peak scores for the sample. The peak SoC for the largest percent of responders (61.4%) was unconcerned (Stage 0). The next greatest percent of responders (17.5%) was located on the informational stage (Stage 3).

[3] The questions that compromise each stage can be found in Table 5.

RQ #6. What is the second highest SoC for PDs of ATEPs with the innovation of instructional design?

Table 24
Frequency of Peak Stage of Concern for Program Directors for the Innovation of Instructional Design

	Peak Stage of Concern							
	0	1	2	3	4	5	6	Total
N	35	10	6	4	1	1	0	57
%	61.4	17.5	10.5	7.0	1.8	1.8	0	100

The second highest SoC can be used along with the highest concern stage to develop further insight into the dynamics of a group concerns (George et al., 2006). In typical situations the secondary peak SoC will be adjacent to the peak SoC. This relationship is based on the developmental nature of concerns. SPSS was utilized to analyze the frequency of respondents with peak scores and secondary peak scores in each of the SoC. Table 25 cross-tabulates each individual's highest and secondary highest SoC. A majority, 61.4% of respondents (31), fall in the highest concern stage of unconcerned (Stage 0). The group displayed a split secondary high SoC with 51.4% of the respondents (18) displayed a secondary high concern of management (Stage 3) and 45.7% of them (16) in the informational (Stage 1) concern.

Table 25
Percent Distribution of Second Highest Stage of Concern in Relation to Peak Stage of Concern of Program Directors

Peak Stage of Concern	Second Highest Stage of Concern								*N*
	0	1	2	3	4	5	6	Row %	
0 Unconcerned	0	16	1	18	0	0	0	61.4	35
1 Informational	2	0	7	0	1	0	0	17.5	10
2 Personal	1	4	0	1	0	0	0	10.5	6
3 Management	0	1	3	0	0	0	0	7.0	57
4 Consequence	0	0	0	0	0	1	0	1.8	1
5 Collaboration	1	0	0	0	0	0	0	1.8	1
6 Refocusing	0	0	0	0	0	0	0	0	0
								Total	57

An additional part of this research was intended to complete hypothesis testing on the differences and relationships between personal, academic, and innovation characteristics. Multivariate analysis and chi squares were completed and the data were used to answer to following two research questions about the innovation of instructional design.

RQ #7. Are there significant differences between the (a) personal demographics, (b) academic demographics, and (c) innovation characteristics, and the SoCs of PDs in ATEPs with the innovation of instructional design?

HO3. There is no significant difference in peak SoC for (a) personal demographics, (b) academic demographics, and (c) innovation characteristics and the SoCs of PDs.

To answer RQ#7 multivariate analysis of variance (MANOVA) procedures were completed to determine whether statistical significance SoCs and (a) personal demographics, (b) academic demographics, and (c) innovation characteristics and the SoCs of PDs. Tabachnick and Fidell (1996) concluded that MANOVAs are more powerful than separate ANOVAs due to the consideration of the impact of the independent variable on a collection of dependent variable. Factorial MANOVAs were not completed because the number of subjects in this study was insufficient to meet the requirements for this type of procedure. The assumptions of linearity, homogeneity of variance-covariance (Box's M statistic of $p > .001$ used due to unequal sample sizes) and normality were met.

To determine statistical significance, the Wilks Lambda statistic was used by the primary researcher. Significance was determined at the 0.05 level. MANOVAs producing statistical significance resulted in a subsequent one-way analysis of variance (ANOVA) being completed. The ANOVA examined whether mean differences were statistically significant.

The primary researcher used the raw scores for each of the seven SoCs. George, Hall, Steigelbauer (2006) recommend the use of the raw scores in statistical analysis over the percentile scores. Each of the scores was entered into SPSS as subject scores for each of the SoC (dependent variables). The tests of significance were then applied.

The main effect of age did yield statistical significance $F(14,96) = 2.534$; Wilks γ ratio of $F = 2.534$, $p = .004$, η^2 0.270.The age of PDs (30-39 years old, 40-49 years old and 50 years old and above) was related to SoC. Follow-up ANOVAs were completed after the check for homogeneity of variance was complete by checking Levene's Test for Equality of Error Variance ($p > .05$). The Bonferroni correction was used to account for the use of multiple ANOVAs, statistical significance set at $p < 0.007$. ANOVAs revealed significant differences in the mean only in Stage 0 (see Table 26).[4]

Table 26
Analysis of Variance for age and Stage 0 for the Innovation of Instructional Design

Source	*Df*	SS	MS	*F*	*p*
Between Groups	2	557.841	278.920	6.978	.002*
Within-group error	54	2158.475	39.72		
Total	56	2716.316			

*$p < 0.007$.

Post hoc comparisons on Stage 1 utilizing the Tukey HSD test indicated that the mean score for the respondents 50 years and older (M = 21.633, SD = 7.037) was significantly different than the score of respondents between the ages of 30-39 (M = 13.14, SD = 5.994). However, the age group of 40-49 (M = 17.65, SD =6.249) showed no significant difference from the other two groups. Table 27 provides descriptive statistics for Stage 0.

[4] Mean percentile comparisons based upon age are displayed in Figure 19

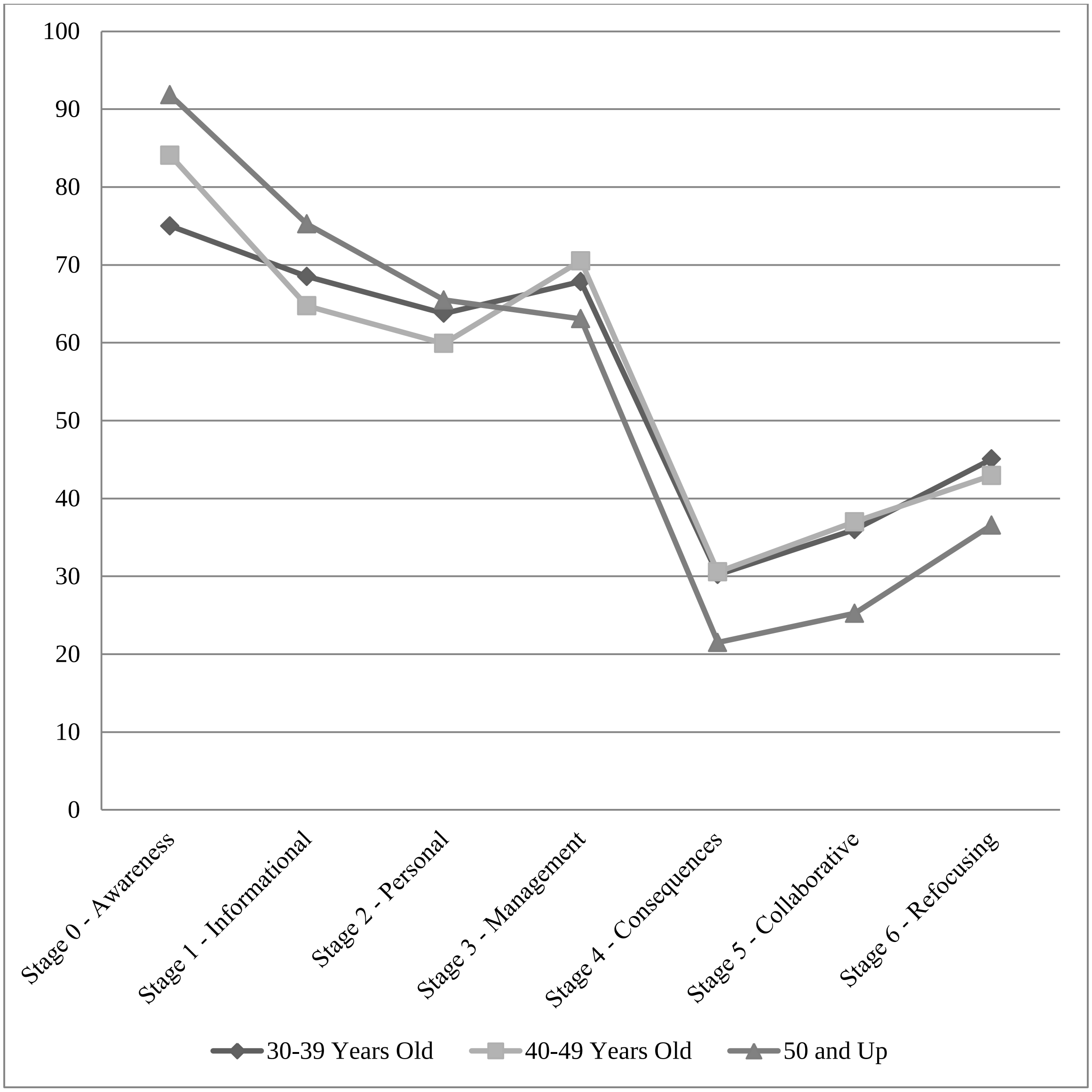


Figure 19. Mean percentile Stage of Concern scores for instructional design comparison by age

The main effect of sex did not yield statistical significance $F(7,49) = 1.055$; Wilks γ ratio of F =1.055, $p = 0.406$, η^2 0.131. Gender of PDs was not predictors of SoC. Follow-up ANOVAs were not needed. Mean percentile comparisons based upon gender are displayed in Figure 20.

Table 27
Mean Differences in Stage 0 for the Innovation of Instructional Design

Source	*N*	M	SD
30-39 years old	22	13.14	5.994
40-49 years old	23	17.65	6.249
50 years and older	12	21.633	7.037

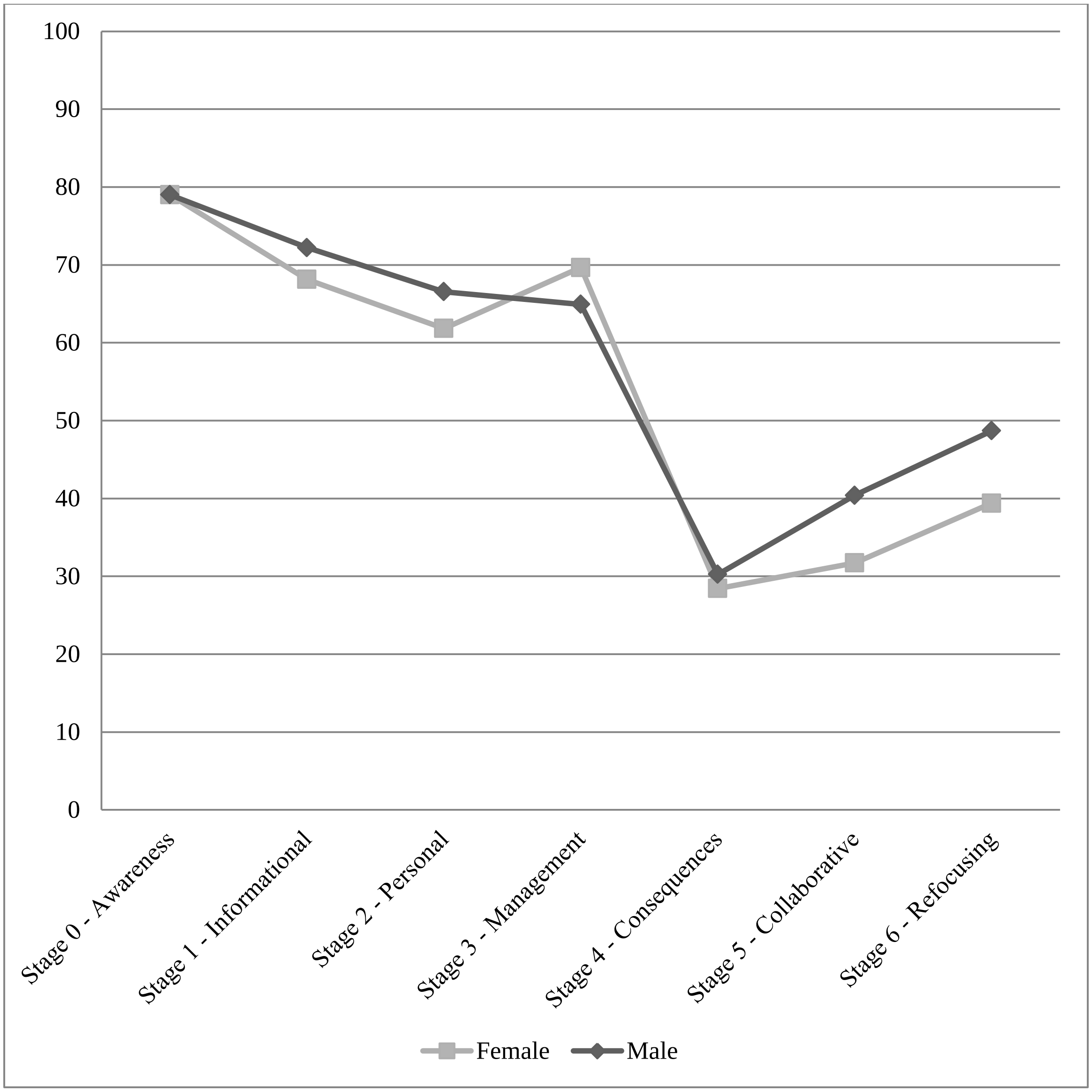


Figure 20. Mean percentile Stage of Concern scores for instructional design comparison by gender

The main effect of tenure yielded statistical significance $F(14,96) = 1.926$; Wilks γ ratio of F = 1.926, $p = 0.033$, η^2 0.219. Clinical or non-tenure, tenure track, or tenured status of PDs was related to SoC. Follow-up ANOVAs were completed after checking Levene's Test for Equality of Error Variance ($p > .05$). The Bonferroni correction was used to account for the use of multiple ANOVAs, statistical significance set at $p < 0.007$. ANOVAs revealed significant differences in the mean only in Stage 0 (see Table 28). Mean percentile comparisons based upon tenure are displayed in Table 28.

Table 28
Analysis of Variance for Age and Stage 0 for the Innovation of Instructional Design

Source	*df*	SS	MS	*F*	*p*
Between Groups	2	455.726	227.863	5.443	.007*
Within-group error	54	2260.590	41.863		
Total	56	2716.316			

*$p < 0.007$.

Post hoc comparisons on Stage 0 utilizing the Tukey HSD test indicated that the mean score for tenured respondents (M = 20.38, SD = 6.289) was significantly different than the scores of both the respondents that were tenure track (M = 14.70, SD = 6.40) and respondents that were clinical or non-tenure (M = 14.31, SD = 6.789). However, there was no statistically significant difference between respondents in the tenure track group and the clinical or non-tenure group. Table 29 provides descriptive statistics for Stage 0.

Table 29
Mean Differences in Stage 0 for the Innovation of Instructional Design

Source	*N*	*M*	*SD*
Clinical or Non-tenure	16	14.31	6.789
Tenure-Track	20	14.70	6.40
Tenured	21	20.38	6.289

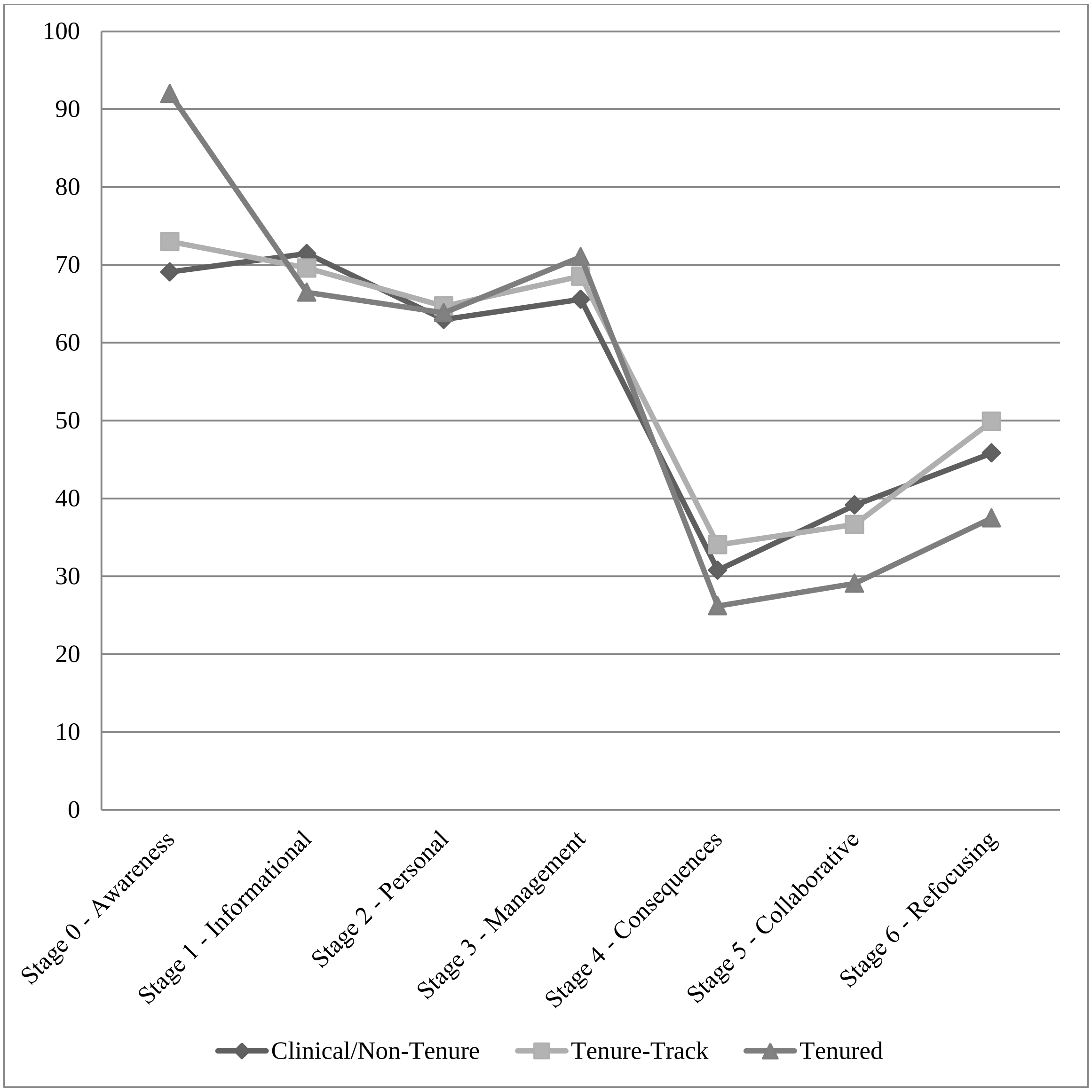


Figure 21. Mean percentile Stage of Concern scores for instructional design comparison by level of tenure

The main effect of highest earned degree did not yield statistical significance $F(7,49) = 1.090$; Wilks γ ratio of $F = 1.090$, $p = 0.384$, η^2 0.135. Possessing a terminal degree versus a non-terminal degree was not a predictor of states of concern. Follow-up ANOVAs were not needed. Mean percentile comparisons based upon highest earned degree are displayed in Figure 22.

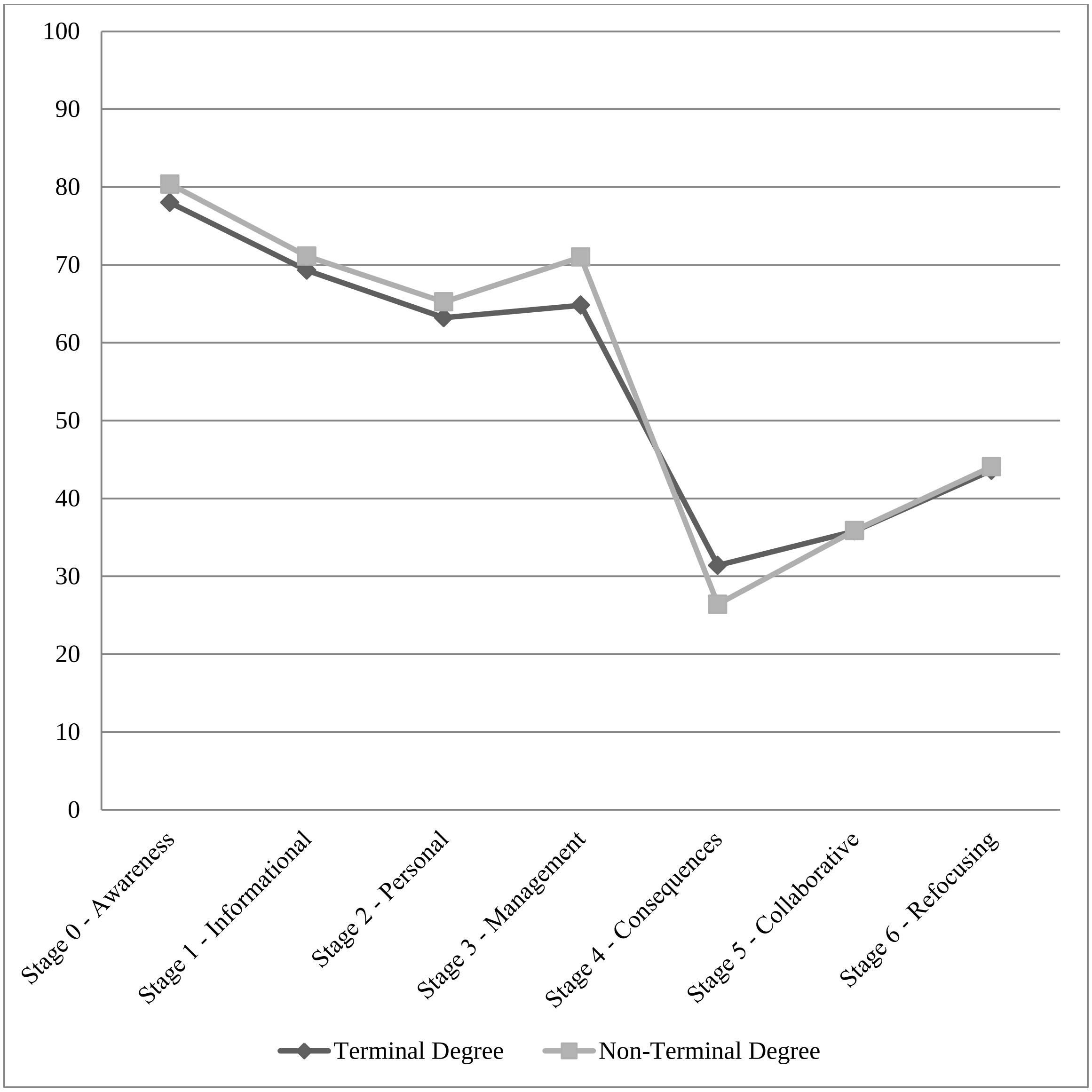


Figure 22. Mean percentile Stage of Concern scores for instructional design comparison by highest earned degree

The main effect of course load did not yield statistical significance $F(14,96) = 1.746$; Wilks γ ratio of $F = 1.746$, $p = 0..059$, η^2 0.202. Program directors' course load, 0-6 credit hours, 7-9 credit hours, or 10-12 credit hours, was not a predictor of SoC. Follow-up ANOVAs were not needed. Mean percentile comparisons based upon course load are displayed in Figure 23.

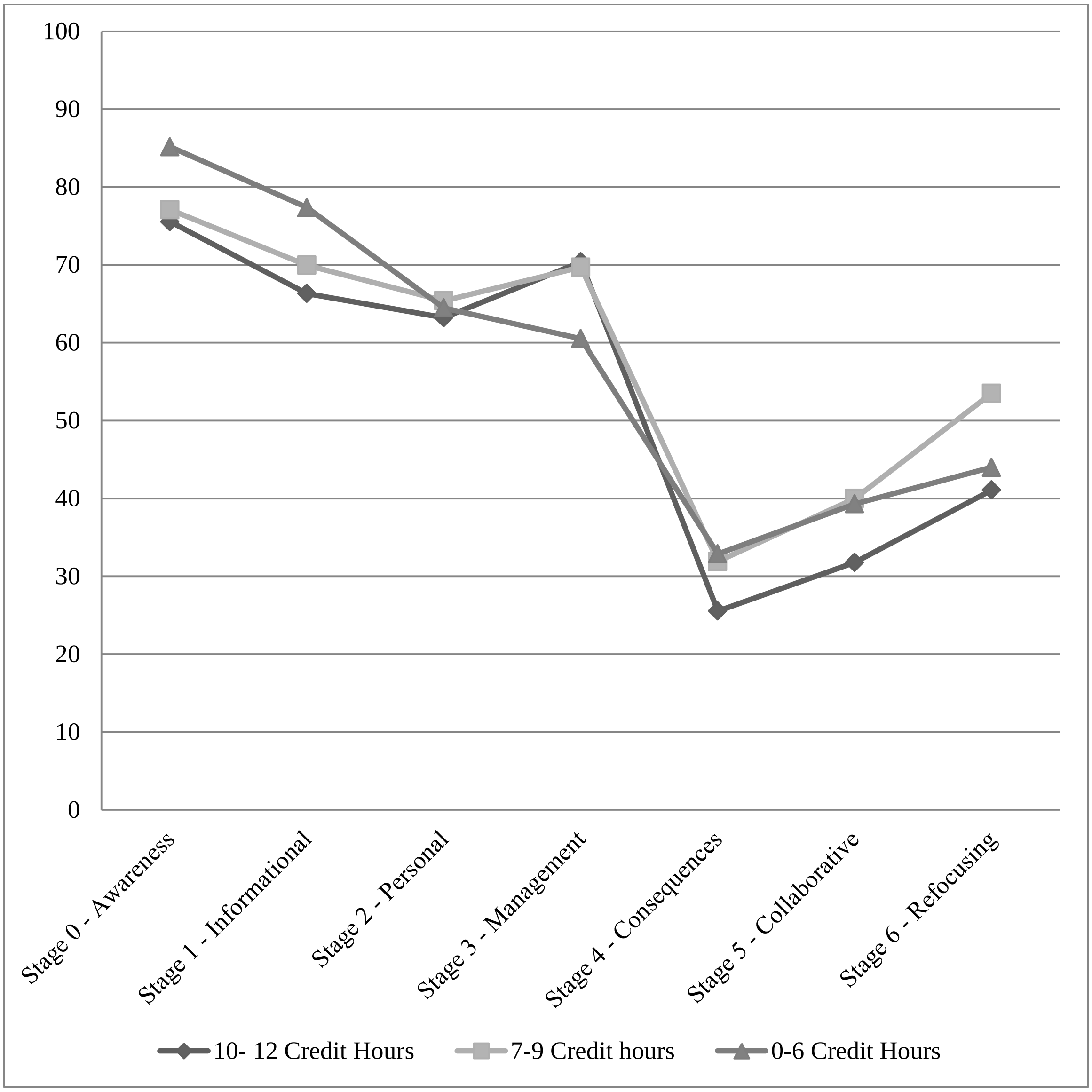


Figure 23. Mean percentile Stage of Concern scores for instructional design comparison by course load.

The main effect of an institution's basic Carnegie level did not yield statistical significance $F(14,96) = 1.409$; Wilks γ ratio of F = 1.409, $p = 0.164$, η^2 0.164. The Carnegie level (bachelor's, master's, and doctoral granting) of the PD was not a predictor of SoC. Follow-up ANOVAs were not needed. Mean percentile comparisons based upon Basic Carnegie Level are displayed in Figure 24.

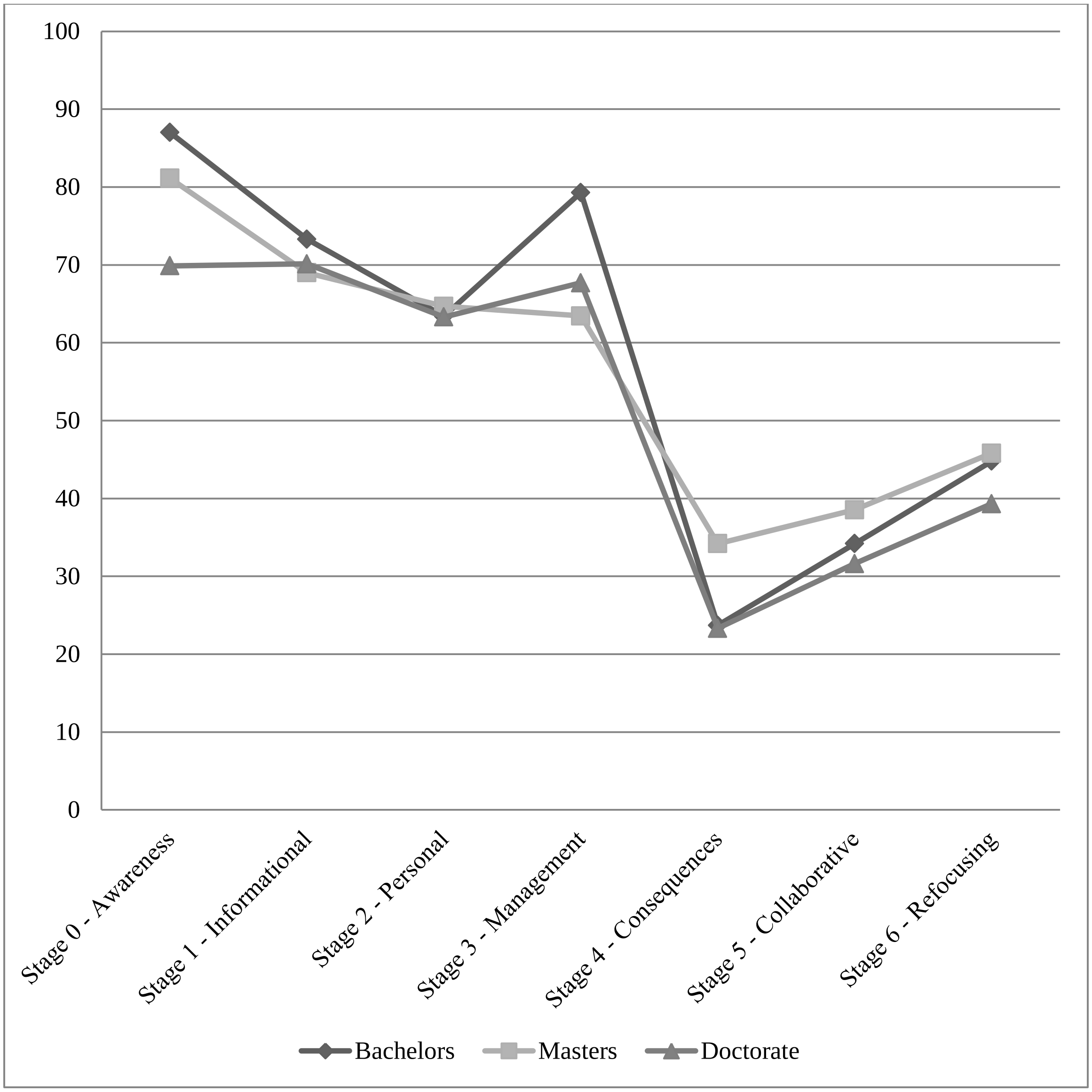


Figure 24. Mean percentile Stage of Concern scores for instructional design comparison by basic Carnegie level.

The main effect of definition yielded statistical significance $F(14,96) = 1.809$; Wilks λ ratio of $F = 1.809$, $p = 0.043$, η^2 0.209. A PD's definition of instructional technology (instructional media, instructional design, and instructional technology) was a predictor of SoC. Follow-up ANOVAs were completed after the check for homogeneity of variance was complete by checking Levene's Test for Equality of Error Variance ($p > .05$). The Bonferroni correction was used to account for the use of multiple ANOVAs, statistical significance set at $p < 0.007$.

Individual ANOVAs did not reveal significant differences at the p >.007 level. Mean percentile comparisons based upon Basic Carnegie Level are displayed in Figure 25.

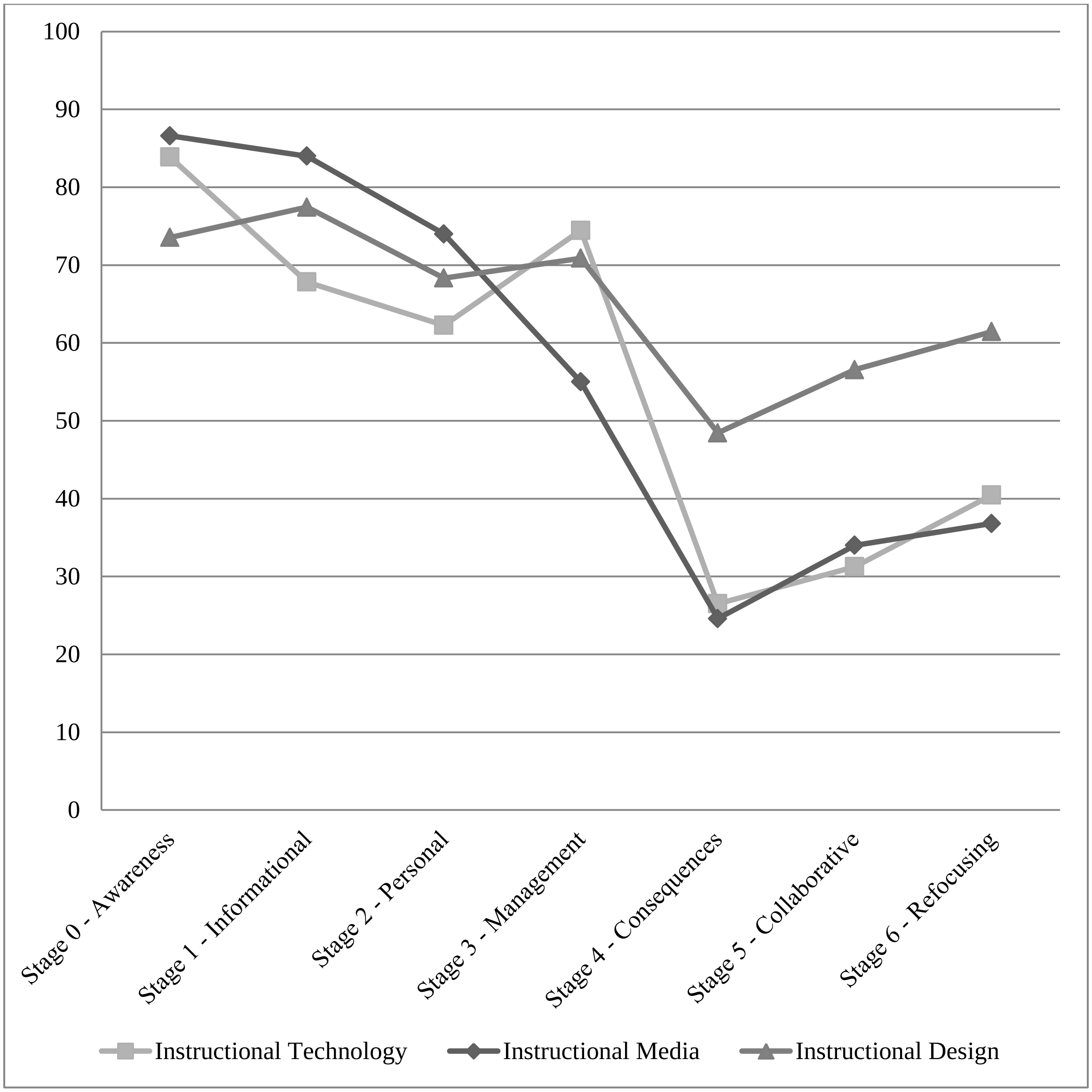


Figure 25. Mean percentile Stage of Concern scores for instructional design comparison by definition of instructional technology.

The main effect of self-identified expertise did yield statistical significance $F(14,96) = 2.220$; Wilks γ ratio of $F = 2.220$, $p = 0.12$, η^2 0.245. Self-identified level of use (novice or non-users, intermediate users, or experienced users) by PDs was related to SoC. Follow-up ANOVAs were completed after checking Levene's Test for Equality of Error Variance ($p > .05$). The

Bonferroni correction was used to account for the use of multiple ANOVAs, statistical significance set at $p < .007$. Individual ANOVAs did not reveal significant differences at the $p > .007$ level. Mean percentile comparisons based upon basic Carnegie level are displayed in Figure 26.

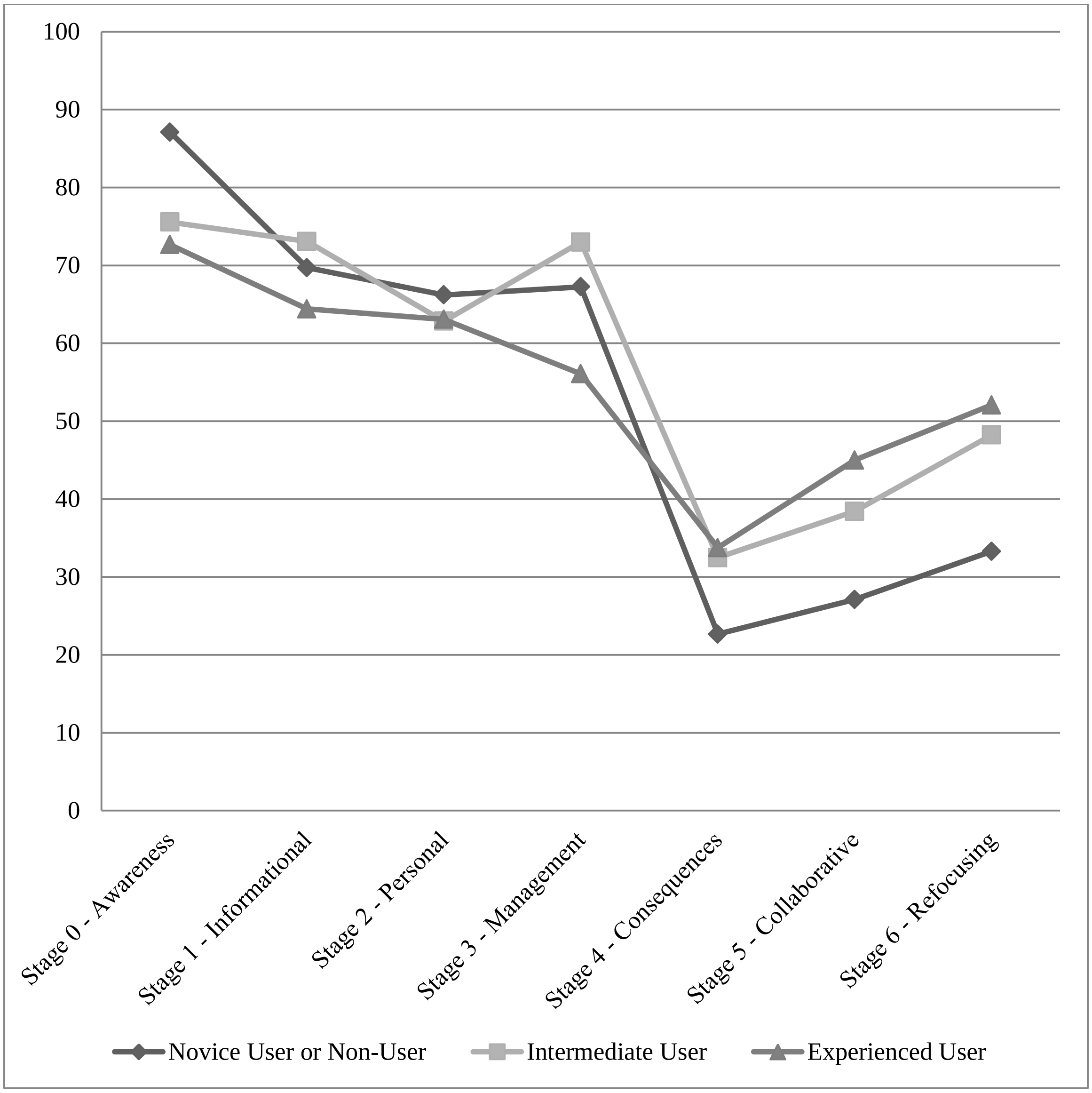


Figure 26. Mean percentile Stage of Concern scores for instructional design comparison by self-identified expertise.

RQ #8. What is the relationship between (a) personal demographics, (b) academic demographics, and (c) innovation characteristics, and the SoCs of PDs in ATEPs with the innovation of instructional design?

HO4. No contributions to a linear composite will significantly relate to the SoCs of PDs in ATEPs with the innovation of instructional design in terms of (a) personal demographics, (b) academic demographics, and (c) innovation characteristics,

To answer RQ8 multinomial logistic regression and binary logistic regressions were not conducted due to the sample size. Peduzzi et al.'s (1996) research evaluated the effects of events per variable in a logistic model. The research found that values of ten and less can cause bias in the results in both a positive and negative direction. To accommodate for low event rates in the dependent variables of all of the SoCs except for Stage 0, the primary researcher converted all data into binary categories (see Tables 6, 7, and 8). The conversion of the SoCs to High (4-6) and Low (0-3) binary categories (see Table 30) did not produce enough events to allow for a binary regression to be used without producing bias in the results.

Table 30
Frequency of Low (Stage of Concerns 0-3) and High (Stage of Concerns 4-6) for Program Directors and the Innovation of Instructional Design

	Highest Stage of Concern		
	Low (0-3)	High(4-6)	Total
N	55	2	57
%	96.5	3.5	100

Bivariate statistics were not included in the original research design but it was decided to explore the relationship between each of the independent variables and the PDs' peak SoC. A chi-square test of independence was completed to determine the independence of the independent variables from the bivariate dependent variable of PD's peak SoC (High or Low).

A Pearson's chi-square was used to examine the difference in distribution between age and PD's peak SoC (bivariate categories of High, Stages 4-6, and Low, Stages 0-3). The sample included 22 respondents who were 30-39 years old and 35 who were 40 years old and older. No significant relationship was found, χ^2 (1, N = 57) = 1.303, *p* = .254. Age did not appear to be related to PD's peak SoC.

A Pearson's chi-square was used to examine the difference in distribution between gender and PD's peak SoC (bivariate categories of High, Stages 4-6, and Low, Stages 0-3). The sample included 30 respondents were female and 27 were male. No significant relationship was found, χ^2 (1, N = 57) = .006, *p* = .940. Gender appears to not be related to PD's peak SoC.

A Pearson's chi-square was used to examine the difference in distribution between tenure status and PD's peak SoC (bivariate categories of High, Stages 4-6, and Low, Stages 0-3). The sample included 16 respondents were non-tenure track or clinical faculty and 41 were tenured or tenured tracked. No significant relationship was found, χ^2 (1, N = 57) = .494, *p* = .482. Tenure status appears to not be related to PD's peak SoC.

A Pearson's chi-square was used to examine the difference in distribution between highest earned degree and PD's peak SoC (bivariate categories of High, Stages 4-6, and Low, Stages 0-3). The sample included 24 respondents with non-terminal degrees and 33 individuals with terminal degrees. No significant relationship was found, χ^2 (1, N = 57) = .053, *p* = .818. Highest earned degree appears to not be related to PD's peak SoC.

A Pearson's chi-square was used to examine the difference in distribution between course load and PD's peak SoC (bivariate categories of High, Stages 4-6, and Low, Stages 0-3). The sample included 40 respondents were instructing 7-12 credit hours and 17 were instructing 0-6 credit hours. No significant relationship was found, χ^2 (1, N = 57) = .881, p = .348. Course load appears to not be related to PD's peak SoC.

A Pearson's chi-square was used to examine the difference in distribution between an institution's basic Carnegie level and PD's peak SoC (bivariate categories of High, Stages 4-6, and Low, Stages 0-3). The sample included 41 respondents from Bachelors or Masters granting institutions and 16 were from doctoral granting institutions. No significant relationship was found, χ^2 (1, N = 57) = .809, p = .368. An institution's basic Carnegie level appears to not be related to PD's peak SoC.

A Pearson's chi-square was used to examine the difference in distribution between respondent's definition of instructional technology and PD's peak SoC (bivariate categories of High, Stages 4-6, and Low, Stages 0-3). The sample included 14 respondents identified with a definition of instructional media or instructional design and 43 identified with the definition of instructional technology. A significant relationship was found, χ^2 (1, N = 57) = 6.366, p = .012. Definition of instructional technology status appears to be related to PD's peak SoC. Respondents identifying with the Instructional Technology Definition are more likely to be in the Lower SoCs.

A Pearson's chi-square was used to examine the difference in distribution between self-reported level of use and PD's peak SoC (bivariate categories of High, Stages 4-6, and Low, Stages 0-3). The sample included 5 respondents identified as non-user or inexperienced while 52 identified as intermediate or experienced users. No significant relationship was found, χ^2 (1, N = 57) = 1.120, p = .290. Self-reported level of use appears to not be related to PD's peak SoC.

Comparison of SoC profiles of instructional media and instructional technology. The final piece of this research was designed to test the hypothesis of differences between the

SoC for instructional design and instructional media. Dependent *t*-tests were used to answer RQ9.

RQ #9. Is there a significant difference between the scores of the individual components of instructional technology, the innovations of instructional media or instructional design, as identified by PDs of ATEPs?

HO5. There is no significant difference in the score for the innovation of instructional media and the peak score for the innovation of instructional design for PDs.

To answer RQ#9 paired *t*-tests were used to compare the means of each of the seven SoC from the sample. The assumptions of the data being either interval or ratio levels and normally distributed were met. Seven paired *t*-tests were completed using SPSS. The results of the paired *t*-tests can be found in Table 31. Figure 27 displays the Mean percentile comparison of the SoCQ for Instructional Media and the SoCQ for Instructional Design. Program directors had significantly higher scores in the unconcerned stage (Stage 0) for the innovation of instructional design (M = 16.68, SD = 14.12) than for the innovation of instructional media (M = 14.12, SD = 5.386), t(56) = 3.483, $p = .001$. They also exhibited significantly lower scores in the consequences stage (Stage 4) for the innovation of instructional design (M = 18.21, SD = 6.33) than for the innovation of instructional media (M = 21.53, SD = 6.03), t(56) = -4.24, $p = .000$. PDs also scored significantly lower in the collaboration stage (Stage 5) for the innovation of instructional design (M = 16.28, SD = 7.23) than for the innovation of instructional media (M = 18.68, SD = 7.49), t(56) = -3.33, $p = .002$. When evaluating the refocusing stage (Stage 6), PDs were significantly lower for the innovation of instructional design (M = 15.00, SD = 6.11) than for the innovation of instructional media (M = 17.93, SD = 4.97), t(56) = -3.853, $p = .000$.

Table 31

Comparison of Stage of Concern Means for Instructional Media and Instructional Design

		Stage of Concern Score				95% Confidence Interval	
	N	Instructional Design	Instructional Media	*T*	*df*	Lower Bound	Upper Bound
Unconcerned (stage 0)	57	16.68 (6.95)	14.12 (5.385)	3.483**	56	1.088	4.034
Informational (stage 1)	57	19.28 (6.57)	18.72 (5.73)	.719	56	-1.004	2.126
Personal (stage 2)	57	17.72 (6.86)	16.95 (7.58)	1.229	56	-.487	2.031
Management (stage 3)	57	18.72 (6.93)	17.89 (6.48)	1.378	56	-.374	2.023
Consequences (stage 4)	57	18.21 (6.33)	21.53 (6.03)	-4.246**	56	-4.880	-1.752
Collaboration (stage 5)	57	16.28 (7.23)	18.68 (7.49)	-3.333*	56	-3.848	-.959
Refocusing (stage 6)	57	15.00 (6.11)	17.93 (4.97)	-3.853**	56	-4.453	-1.407

Note. * = $p < 0.05$, ** = $p < 0.001$. *Standard deviations appear in parentheses below means.*

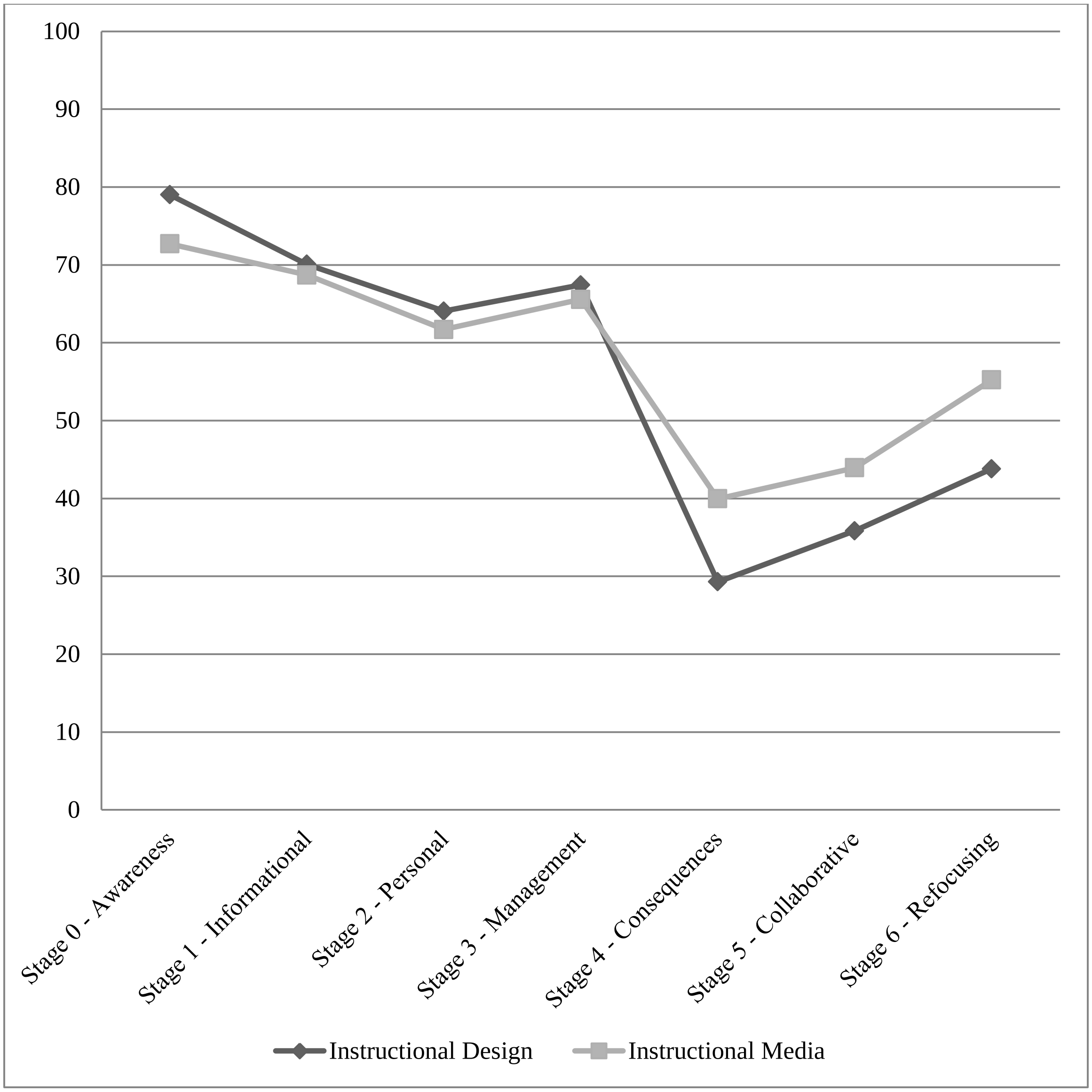


Figure 27. Mean percentile comparison of the SoCQ for instructional media compare to SoCQ for instructional design.

CHAPTER 5

DISCUSSION OF RESULTS

This study examined the concerns of program directors (PDs) with the innovations of instructional media and instructional design. The purpose of this study was to determine PDs' peak and secondary Stages of Concerns (SoCs) with the innovations of instructional media and instructional design. This study also sought to investigate (a) personal demographics, (b) academic demographics, and (c) innovation characteristics and the influence they had on the SoC of PDs.

Theoretical Framework

This study used the Concerns Based Adoption Model (CBAM) as its framework. CBAM was designed to assess the value of a given innovation. With CBAM, Hall and Hord (1987) sought to understand the process that educators experienced while adopting and implementing innovations. The key to adoption centers on change as a process and not an event. Change facilitators understand that change is affected by the concerns of individuals (Hall & Hord, 1987). The CBAM is composed of three dimensions: the SoC, Level of Use (LoU), and Innovation Configuration (IC). For this study, the SoC was used to evaluate the personal side of change for PDs with the innovations of instructional media and instructional design. The SoC has four basic areas of concerns: (a) Impact (Stages 4-6) – focus is on the effect the innovation has and how to increase outcomes, (b) Task (Stage 3) – focus is on management of the innovation (e.g. time, logistics, and scheduling), (c) Self (Stages 1&2) – focus is on personal feelings and impact of innovation on the adopter, and (d) Unconcerned (Stage 0) – adopters are focused on other concerns than those of the innovation. The objective in understanding the SoC profile is to develop a holistic perspective of the concerns of the individual. Evaluating the peak and secondary peak SoC can provide change facilitators with insights to PDs' concerns and their position in the adoption process (George et al., 2006).

Analysis for this study centered on two separate SoC Questionnaires (SoCQ), one for the innovation of instructional media and the other for the innovation of instructional design. From the SoCQ a concerns profile, a graphical representation of the concerns of the individual as they relate to a given concern was created. In this study, the SoC profiles for the group of PDs were evaluated. The SoC profiles provided further understanding to the underlying progression of adoption and diffusion of an innovation beyond that which is gained from the peak and secondary peak SoC. The classification of SoC profiles is based on peaks and valleys within the profile. Some typical examples include the nonuser profile (high relative intensities, Stages 0-2), management concern profile (peak SoC on Stage 3), and a consequences concern profile (high relative intensities on Stages 4-6).

Program Directors Stage of Concern with Instructional Media

The peak SoC (RQ #1) for PDs of ATEPs with the innovation of instructional media was Stage 0, unconcerned. The secondary peak SoC for PDs (RQ #2) with the innovation of instructional media revealed a relatively high intensity on Stage 1 (informational). According to Hall et al. (1979), these values align the PDs with the profile of a nonuser with high relative intensities on Stages 0, 1, and 2 (low level concerns). Individuals with nonuser profiles most closely align with Fuller's (1969) description of the self-concerned individual. The peak SoC, Stage 0, suggests that the PDs are preoccupied with a number of different tasks, taking concentration away from instructional media. The secondary peak indicates that individuals are searching for information on the innovation. Additional insight provided by the profile is a dramatic rise in the relative intensity of Stage 6 over that of Stage 5. This phenomenon is referred to as “tailing up” and means that PDs believe there are better options to utilizing instructional media and hold an overall negative feeling about the adoption of instructional media.

In this study approximately 77% (n = 42) of the PDs were identified in the low level concerns (Stage 0, 1, and 2). These findings are similar to findings by Shoepp (2004), investigating technology rich environments, and Newhouse (2001), examining laptop use among instructors. In both studies non-user profiles emerged for 66.7% and 53% of respondents, respectively.

Newhouse (2001) investigated participants over four years and found that they remained nonuser regardless of the available technology. Similar to the Newhouse study, Fincher and Wright (1996) reported that approximately 50% of PDs were nonusers. Fifteen years later this current study found that 77% of PDs were nonusers. It is expected that individuals engaged with the change process would progress from low level concerns (Stage 0, 1, and 2) towards high level concerns (Stage 4, 5, and 6) and ultimately adoption (Hall & Hord, 2006). In this study, however, PDs were stagnant in the adoption process, meaning that either the environment or the interventions have not been appropriate to decrease the lower level concerns while promoting the adoption of instructional media.

Research question three (RQ #3) investigated the influences of (a) personal demographics, (b) academic demographics, and (c) innovation characteristics on the SoCs of PDs with the innovation of instructional media. Personal demographics of respondents have shown previously to have little to no effect on adoption rates of instructional technology (Rogers, 2003; Sahin & Thompson, 2007; Zayim et al., 2006). In this study it was found that PDs' personal demographics (gender and age) did not impact their SoCs.

Similar results were seen in academic demographics (tenure, highest degree, average course load, and basic Carneige level) where PDs also displayed no significant differences when compared with SoCs. Zayim et al. (2006) and Li and Linder (2007) both investigated academic demographics and found no significant influences on SoC. Contrary to the current study and previous work, Al-Rawajfih (2010) found that less experienced teachers (1-5 years) were more advanced (lower relative intensities on SoC 0-2 and higher level intensities on SoC 4-6) than more experienced teachers (6-10 years, 11-15 years, and 16-10 years).

Innovation characteristics in this study (level of experience with instructional media, definition of instructional technology, and previous training with instructional media) were also found to have no significant influence on SoCs. This was not a surprise due to the extreme polarity of responses from PDs: 91.2% (n = 52) of the respondents identified as being intermediate or experienced with instructional media, 97.7% (n = 54) had received some type of training, and 75.4 (n = 43) identified with the tools and process definition. In this study PDs assertion of being at the intermediate or experienced level is inconsistent with their associated nonuser profile (high relative intensities on Stage 0, 1, and 2). It is expected that intermediate or experienced users would be concentrating on the impact of instructional media as signified by a SoC profile that exhibits peaks in the high level concerns (SoC 4-6). The finding that previous training had no statistical impact on SoCs is inconsistent with previous research (Bitner & Bitner, 2002; Howland & Wedman, 2004; Jaber & Moore, 1999), which showed a positive impact of training on the adoption process. For two innovation characteristics (level of experience and previous training with instructional media) outcomes were different than expected. Program directors in this study indicated they are experts and have been receiving sufficient training to interact with instructional media. Both of these traits are identified in populations that have been favorable to adoption (Bitner & Bitner, 2002; Howland & Wedman, 2004; Jaber & Moore, 1999). However, the SoC profile of PDs in this study designates a group that is very early in the adoption process, nowhere near adoption. As indicated by the SoCQ, the PDs are seeking more information and trying to understand how instructional media affects them.

The fourth research question (RQ #4) evaluated the relationships between the SoCs and (a) personal demographics, (b) academic demographics, and (c) innovation characteristics. Originally this question was to be analyzed with logistical regression to evaluate the effects of each of the variables, however, low response rates inhibited the researcher's ability to complete this analysis. Bivariate analysis was substituted to explore possible underlying relationships that might impact SoCs for PDs. To complete this analysis SoCs were converted to either low concerns (Stage 0-3) or high concerns (Stage 4-6) concerns. Similar to the research completed by Palmore (2011) on the integration of technology, this study found no significant relationships between any of the variables and high or low level SoCs. These findings are consistent with research evaluating personal and academic demographics (e.g., Bitner & Bitner, 2002; Dusick, 1998; Howland & Wedman, 2004; Jaber & Moore, 1999; Peluchette & Rust, 2005; Reznich, 1997). Previous research on the relationship of innovation characteristics to personal and academic demographics (Bitner & Bitner, 2002; Dusick, 1998; Howland & Wedman, 2004; Jaber & Moore, 1999; Peluchette & Rust, 2005; Reznich, 1997) suggested that user experience and prior training would have a positive relationship SoC for instructional media, however, that was not the case in this study.

The results of this study for the innovation of instructional media revealed that PDs SoC profiles are those of a nonuser. In contrast to previous research, this study found that PDs beliefs toward instructional media (intermediate or expert user) and prior training did not correlate with the typical developmental nature of SoCs and their expected high level concerns (Stage 4-6). In fact, PDs remain at low level concerns (Stage 0-3) indicating a resistance to the adoption process. This is even more intriguing when considering previous research complete by Fincher and Wright (1996) that suggest that over half of PDs were engaged with instructional technology. Using the framework of the CBAM as a guide, it was expected that PDs would have moved towards adoption over a five-year period (Hall & Hord, 2006). This study shows this is not the case and 77% of PDs remain nonuser after a period of 15 years.

Program Directors Stage of Concern with Instructional Design

The peak SoC (RQ #5) for PDs of ATEPs with the innovation of instructional design was Stage 0 (unconcerned). Investigation of the secondary peak SoC for PDs (RQ #6) with the innovation of instructional design revealed a split in the population. Program directors exhibited relatively high intensities on Stage 3, management (n = 18), and Stage 1, informational (n = 16), SoCs. Even with the split in the secondary peak SoC, the high relative intensities on Stages 0, 1, and 2 (low level concerns) still align with the profile of a nonuser (Hall et al., 1979). The split suggest two strong concerns. Stage 1 concerns align with Fuller's (1969) description of the self-concerned individual. Program directors in this group are seeking more information about instructional design. Program directors in the Stage 3 group are focused on the management of instructional design. These individuals are typically very busy, either engaging with the innovation itself or other job demands. The "tailing up" phenomenon is present for instructional design, suggesting that PDs believed there are better options to utilize than instructional design and hold an overall negative feeling about the adoption of instructional design.

In this study, approximately 89% (n = 51) of the PDs were identified in the low level concerns (Stage 0, 1, and 2) with the innovation of instructional design. These results are similar to those of the innovation of instructional media presented earlier. When evaluating educational innovations several researchers (e.g., Newhouse, 2001; Shoepp, 2004) discovered populations with similar profiles concentrated with low level concerns (Stage 0, 1, and 2). Current research in athletic training has not evaluated the innovation of instructional design.

Research question seven (RQ #7) investigated the influences of (a) personal demographics, (b) academic demographics, and (c) innovation characteristics on the SoCs of PDs on the innovation of instructional design. Previous research has demonstrated little to no effect of personal or academic demographic information on adoption rates of instructional technology (Rogers, 2003; Sahin & Thompson, 2007; Zayim et al., 2006). However, no previous research has looked at their influence on instructional design, a component of instructional technology. Similar to the outcomes for the instructional media component of this study, personal demographics (gender), academic demographics (highest degree, average course load, and basic carnegie level), and innovation characteristics (level of experience and previous training with instructional media) had no influence on SoCs.

Contrary to previous research, age and tenure status did influence SoCs of PDs in this study. Statistically significant was observed in the variable of age on Stage 0 concerns of PDs with the innovation of instructional design. This finding is contrary to evidence presented by Zayim et al. (2006) and Li and Linder (2007) that found age did not impact the SoC of study participants. In this study, program directors over the age of 50 had statistically significant higher relative intensities than their younger counterparts (39 years and younger) on Stage 0 concerns. This study's findings were similar to Al-Rawajfih's (2010) study that found less experienced teachers (1-5 years) were at more advanced SoCs (higher level – Stages 4-6) than more senior teachers (6-10 years, 11-15 years, and 16-10 years) with the innovation of e-learning.

The second area of significance discovered was in the variable of tenure status (academic demographics) and the relative intensity of Stage 0 concerns. A number of previous studies (Li and Linder, 2007; Zayim et al., 2006;) had not shown an influence of tenure on SoC. Contrary to those studies, Petherbridge (2007) found that tenure influenced the concerns of faculty. It was demonstrated that tenured faculty had lower relative intensities on low level concerns (Stage 0-2) (Petherbridge, 2007). In contrast to them all, this study demonstrated statistically significant differences between tenured PDs (n = 21) and both clinical or non-tenure (n = 16) and tenure-track (n = 20) PDs. While all three groups had high relative intensities on Stage 0, tenured PDs exhibited statistically significantly higher concerns in Stage 0 (unconcerned). These results are more in line with the work of Jacobson and Weller (1987) that found that full professors had less interest in the utilization of computer technology than assistant professors. Shea (2007) reported similar findings when evaluating the utilization of online courses. Shea's research found that younger individuals were more likely to engage with the innovation as it was seen to be beneficial to the tenure and promotion process.

The eighth research question (RQ #8) weighed the relationships between the SoCs and (a) personal demographics, (b) academic demographics, and (c) innovation characteristics. Due to a low return rate the researcher had to modify the analysis used for RQ #8. The initial blueprint for this study employed logistical regression. To maintain the objective of RQ #8 bivariate analyses were substituted to explore possible underlying relationships that might impact

SoCs for PDs. To complete this analysis SoCs were converted to either low concerns (Stage 0-3) or high concerns (Stage 4-6) concerns. Similar to the research completed by Palmore (2011) on the integration of technology, this study found no significant relationships between any of the variables and high or low level SoC. These findings are consistent with research investigating the utilization of educational technologies (Bitner & Bitner, 2002; Dusick, 1998; Howland & Wedman, 2004; Jaber & Moore, 1999; Peluchette & Rust, 2005; Reznich, 1997) with the exception of innovation characteristics. Earlier research (Bitner & Bitner, 2002; Dusick, 1998; Howland & Wedman, 2004; Jaber & Moore, 1999; Peluchette & Rust, 2005; Reznich, 1997) suggests that user experience and prior training has a positive relationship to the SoCs for instructional design; however, that was not observed in this study.

In summary, the results of this study for the innovation of instructional design revealed that PDs' SoC profiles are those of a nonuser. In a divergence from similar studies, it was demonstrated that age and tenure influenced the relative intensity of PDs' concerns on Stage 0 (unconcerned). Tenured PDs and PDs over the age of 50 had statistically significantly higher relative intensities in comparison to their respective counterparts (clinical or non-tenure and tenure track; 39 years and younger). Similar to the outcomes seen with the innovation of instructional media, it was observed that PDs beliefs toward instructional design (intermediate or expert user) and prior training did not correlate with the typical developmental nature of SoCs and anticipated higher level concerns (Stage 4-6). This suggests that PDs believe they are intermediate or expert users of instructional design when in reality they are yet to fully understand the impact of the innovation. This disconnect could be problematic in the implementation of instructional design.

Influence of PDs' Definition of Instructional Technology on SoC Profiles

This study investigated the PDs understanding of instructional technology by assessing their selection of a definition for instructional technology from three options: (a) system definition of instructional technology, (b) instructional media (tools) or (c) instructional design (process). The variable of definition was utilized in the analysis of RQ#3 (influence on SoC for instructional media), #4 (relationship with SoC for instructional media), #7 (influence on SoC for instructional design), and #8 (relationship with SoC for instructional design). Statistical significance was only observed when examining the relationships between the definition of instructional technology and concerns with the innovation of instructional design. Program directors that identified with the systemic definition of instructional design were more likely to be profiled in low level concerns (Stage 0-2). This result could mean that PDs are unable to differentiate instructional design from instructional media. This sense of unawareness in turn equates to higher relative intensities on low level concerns (Stage 0-2). No previous research has evaluated the impact of an individual's definition of instructional technology on his or her concerns with the use of either instructional media or instructional design.

Comparison of SoC Profiles of Instructional Media and Instructional Technology

Current research in both athletic training education and allied health professions has focused solely on the instructional media component of instructional technology (Fincher & Wright, 1996, Petherbridge, 2007; Rogers, 2003; Sahin & Thompson, 2007; Zayim et al., 2006). The present study evaluated both constructs of instructional technology: (a) instructional media and (b) instructional design. Research question nine focused on the two respective SoC profiles and analyzed them for statistically significant differences. Paired *t*-tests revealed statistical significance at four of the SoC: Stage 0 (unconcerned), Stage 4 (consequences), Stage 5 (collaboration), and Stage 6 (refocusing). Analysis of Stage 0 (unconcerned) demonstrated that

PDs had statistical significantly higher relative intensity for the innovation of instructional design when compared with those of instructional media. Higher relative intensities on low level concerns (Stage 0-2) insinuate that PDs are less familiar with instructional design and seeking more information, if they are concerned at all. The final three SoCs represent high level concerns or impact-centered concerns. Program directors had statistical significantly lower relative intensity for instructional design than for instructional media. This finding demonstrates that PDs are less likely to have adopted or implemented instructional design into their personal practices. Both profiles exhibit the characteristics of a nonuser; however, PDs' concerns with instructional design are stronger in low level concerns (Stage 0-2) and weaker in high level concerns (Stage 4-6) than PDs' concerns with instructional media when comparing SoC profiles. When employing the CBAM for either SoC profile, change facilitators must concentrate on addressing the low level (Stage 0-2) or self-based concerns. Through focused interventions change facilitators can help alleviate low level concerns and facilitate higher level concerns as the PDs move through the adoption process.

Conclusions

The findings from this study improve the understanding of PDs' concerns related to the innovations of instructional media and instructional design. The findings indicate that PDs SoC profiles for both the innovation of instructional media and instructional design resemble that of a nonuser. Both profiles exhibited high relative intensities on low level concerns (Stage 0-2) and indicate individuals focused on self-based concerns. Results of this study also suggest that PDs' definition of instructional technology, their age and their gender influenced their concerns with the innovation of instructional design.

Three conclusions about instructional technology use by PDs in ATEPs can be drawn from the findings:

1) The diffusion of both instructional media and instructional design by PDs is stagnant. Fincher and Wright (1996) reported that approximately 50% of PDs were utilizing instructional media; 17 years later, this study finds that PDs are still considered nonusers.

2) There is a disconnect between PDs' self-reported level of use of the innovation of instructional technology and their SoC profiles. Contrary to other studies (Bitner & Bitner, 2002; Dusick, 1998; Howland & Wedman, 2004; Jaber & Moore, 1999; Peluchette & Rust, 2005; Reznich, 1997) linking high self-efficacy to adoption, this study found that program directors self-identified as intermediate or expert users of both instructional media and instructional design while exhibiting a SoC profile of a non-user.

3) PDs do not understand the innovation of instructional design as well as they understand the innovation of instructional media. This study found that the PDs' definition of instructional technology also impacted SoC profiles for instructional design, but not their SoC profiles for instructional media.

Implications for Practice

Findings suggest that change facilitators develop options for PDs to immerse themselves in instructional technology. Interventions should be designed to provide PDs with answers (Stage 1 concerns) and support (Stage 2 concerns) as they relate to both instructional media and instructional design. The adoption and ultimately the diffusion of instructional technology through ATEPs is guided by the individual. Kagima and Hausafus (2000) indicated that institutions would be better suited to invest not only in the tangible (instructional media) but contribute time, resources, support, expertise, and access to the individual as he or she engages with the change process. Hall (2010) describes the Achilles tendon of technology as a lack of understanding how to help faculty integrate and implement technology in their courses. Change facilitators, CAATE and/or administrators, in turn must understand the individual's concerns to engage the adoption process. This study categorized PDs as nonusers with high relative intensities on low level concerns (Stage 0-2), identifying a need for change facilitators to develop targeted interventions focused on the self-based concerns.

Change is a process and not an event so change facilitators should develop interventions that monitor and address PDs' concerns as they progress through the adoption process. Change facilitators should avoid an event mentality when designing interventions to encourage adoption of instructional technology. Change facilitators have to understand that change is a process and that development of a competent user takes time (Hall et al., 1973). Hall and Hord (2006) suggested that this period of adoption can take up to five years and acknowledges that some individuals may not ever progress beyond current concerns regardless of intervention. Successful interventions will engage the concerns of the individual, moving towards resolution of their lower level concerns. As low level concerns (Stage 0-2) are resolved individuals will move through the developmental progression of the SoC. Constant monitoring of concerns through utilization of the SoCQ will help change facilitators understand the progress of an intervention and help them alter it as necessary. Hall and Hord (2001) suggests that for change to occur successfully there needs to be continuing communication, ongoing training, on-site coaching, and time for implementation.

Targeted interventions should be utilized to bridge the gap between the expectations of technology used outside of the classroom and those currently utilized in the classroom (Hall, 2010). The inherit nature of technology leads to an accelerated rate of advancements and new practices which change facilitators must accommodate when developing interventions to address PDs' concerns. Adding additional conflict to the change process is that technology based innovations typically continue to evolve over time (e.g., desktop computer, laptop, iPad). In this study, age and tenure were found to influence SoC for instructional design. Similar to other research (Roberts, Kelley, & Medlin, 2007; Shea, 2007), the achievement of tenure changed the focus of faculty member. Shea (2007), similar to this research, found that non-tenured younger faculty members were more likely to engage with the innovation than their counterparts. Additional research (Al-Rawajfih, 2010; Fletcher & Deeds, 1994; Todd, 1993) points to the concept of immersion. The impact of age, and to extent tenure, can be explained by younger PDs recently being exposed to new ideas in instructional design during their preparatory curriculum. Older PDs that have no reference point or previous use of an innovation in turn will exhibit high relative intensities on low level concerns (Hall & Hord, 1997). Targeted interventions will allow change facilitators to incorporate the personal side of change and promote the adoption process (Hall, 2010).

Change facilitators should develop interventions that provide faculty with the opportunity to understand and interact with both instructional media and instructional design. Through exposure to both components of instructional technology PDs can begin to relieve low level concerns (Stage 0-2) and move toward high level concerns (stage 4-6) by focusing on the impact of instructional technology. This research explored the constructs of instructional technology by evaluating PDs concerns with instructional design and instructional media. In both cases PDs' concerns were centered on the individual and the impact they would have on them. The interesting finding in comparing both SoC profiles was that PDs concerns were stronger for instructional design than instructional media when looking at low level (Stage 0-2) concerns and weaker when looking at high level (Stage 4-6) concerns. While, both profiles are still that of nonusers this finding demonstrates PDs are integrating instructional media more freely into their practices than instructional design. Change facilitators should be concerned with this finding. PDs subscribing to the systemic definition of instructional technology are more comfortable in the tools (instructional media) but not the process (instructional design). This finding indicates that PDs may be integrating instructional technology without understanding the process (instructional design) to engage the tools (instructional media) or evaluate outcomes.

Program directors should be integrated in the adoption process by actively engaging them with both group and individual based SOC profiles. This information can provide PDs with a greater self-understanding of their concerns with instructional technology. Exposing individuals to their SoCs can engage them in the change process. In this study, PDs identified as being intermediate or expert users with both components of instructional technology while their SoC profiles exhibited the concerns of a nonuser. Awareness of one's concerns may help him or her engage more openly in interventions by understanding where they lie in the adoption process. Empowering PDs with their SoC profiles may enable individuals to engage in opportunities that will help them attain higher level SoCs on the road to adoption and ultimately diffusion of instructional technology.

Implications for Future Research

This study identified the SoC of PDs in ATEP with the innovations of instructional media and instructional design. The findings of this research lead to the following research recommendations for future research:

1. The study should be replicated to include additional faculty interacting with the ATEP, including clinical coordinators, adjunct instructors, and preceptors. PDs

represent the individual responsible for the operations of the ATEP, however, many more individuals are involved in the core instruction of an ATEP. Understanding their concerns with the two constructs of instructional technology will further the efforts of change facilitators.

2. Additional research should utilize the SoCQ in a longitudinal method to assess the progress of the interventions as well as gauge current concerns of the ATEP educators. Using guidelines provided by Hall and Hord (2006), this study should be replicated over periods of one, three, and five years demonstrating the developmental nature of the SoC. As change facilitators work to address the concerns of PDs with instructional technology, the developmental nature of the SoCs will result in the progression of the natural development curve of the SoC. As the PDs' concerns change from self to task to impact so must the interventions to successfully progress through the adoption process.
3. Future studies should investigate instructional media and instructional design separately. Distinct SoCQs can help increase survey respondent participation and decrease early termination.
4. Future research should examine PDs' levels of competence, use, and practice of integration with instructional media and instructional design. Comparatives evaluating both SoC and PDs' practices can give a richer understanding of the adoption process.

Summary of Study

The purpose of this study was to determine the concerns PDs have with the innovations of instructional media and instructional design. Data indicate that with both innovations, PDs display a nonuser SoC profile. Program directors, overall, were unconcerned with either innovation and were focused on what impact they would have on them, not the overarching impact of the innovation on outcomes. This study, when compared to Fincher and Wright (1996) also found that PDs have remained stagnant over the last 15 years in the adoption and diffusion process with instructional media. Further results of this study demonstrated that age and tenure status of faculty influenced the relative intensity of PDs on Stage 0 concerns with the innovation of instructional design. Program directors concerns with instructional design were also related to the identification of the systemic definition of instructional technology. Respondents selecting the systemic definition of instructional technology were more likely to be centered on low level concerns (Stage 0-2) for instructional design, indicating that PDs understand the tools portion of the definition but are not as clear on the impact of the process component of instructional technology. This study also found that PDs, presenting nonuser profiles for both innovations, were further along in the adoption process for instructional media than for instructional design. The findings of this study can be used (a) to guide future research into the concerns of PDs as they relate to the adoption and diffusion of instructional technology through ATEPs and (b) to direct change facilitators involved with ATEPs to address barriers to the adoption and diffusion of instructional technology.

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APPENDIX

Appendix A - SEDL Agreement

SEDL License Agreement

To: Jeremy Searson (Licensee)
669 Cornerstone Circle
Irmo, SC 29063

From: Nancy Reynolds
Information Associate
SEDL
Information Resource Center—Copyright Permissions
4700 Mueller Blvd.
Austin, TX 78723

Subject: License Agreement to reproduce and distribute SEDL materials

Date: May 5, 2010

Thank you for your interest in using the *Stages of Concern Questionnaire* (SoCQ 075) published by SEDL and written by Archie A. George, Gene E. Hall, and Suzanne M. Stiegelbauer in 2006 as Appendix A, pages 79-82 in *Measuring Implementation in Schools: The Stages of Concern Questionnaire*, as a PDF document on an accompanying CD-ROM, in electronic format as SEDL's *Stages of Concern Questionnaire (SoCQ) Online* and published on pages 48-49 in the SEDL publication *Taking Charge of Change*, revised ed., published in 2006, 2nd printing, 2008, that was written by Shirley M. Hord, William L. Rutherford, Leslie Huling, and Gene E. Hall.

This instrument will be referred to as the "work" in this License Agreement. SEDL is pleased to grant permission to the Licensee who will administer the work at the University of South Carolina and the University of Alabama for doctoral research and will include the work in his dissertation titled *Stages of Concern: Measuring Faculty Implementation of Instructional Innovation among Athletic Training Education Programs* from the University of Alabama in Tuscaloosa, AL. The following are the terms, conditions, and limitations governing this limited permission to reproduce the work:

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Fax: 512-476-2286
www.sedl.org
4700 MUELLER BLVD., AUSTIN, TX 78723

2. No adaptations, deletions, or changes are allowed with the exception of substituting the words "the innovation" with a word or phrase that will more appropriately reflect the implementation of a particular piece of software that participants will recognize and questions that can be added to identify demographic indicators for participants before or after the instrument, but otherwise, the wording and order of items cannot be changed. No additional derivative work based on or incorporating the work will be created without the prior written consent of SEDL.

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I'm e-mailing you a PDF of this agreement. Please print and sign one copy below, indicating that you understand and agree to comply with the above terms, conditions and limitations, and send the original back to me. If you wish to keep a copy with original signatures, please also print, sign, and return a second copy and, after I receive and sign the copies, I'll return one to you with both of our signatures.

Thank you, again, for your interest in using the *Stages of Concern Questionnaire (SoCQ)*. If you have any questions about this License Agreement, please contact me at 800-476-6861, ext. 6548 or 512-391-6548, or by e-mail at nancy.reynolds@sedl.org.

Sincerely,

______________________________ ____________________
Nancy Reynolds for SEDL — Date signed

Agreed and accepted:

Signature: __________________________ ____________________
Date signed

Printed Name: ________________________

Appendix B – IRB Approval

Office for Research

Institutional Review Board for the Protection of Human Subjects

THE UNIVERSITY OF ALABAMA
RESEARCH

April 22, 2011

Jeremy Searson
College of Education
The University of Alabama

Re: IRB # 11-OR-139 "Concerns of Program Directors of Athletic Training Education Programs with the Innovations of Instructional Media and Instructional Design"

Dear Mr. Searson:

The University of Alabama Institutional Review Board has granted approval for your proposed research.

Your application has been given expedited approval according to 45 CFR part 46. You have also been granted the requested waiver of written documentation of informed consent for the online survey participants. Approval has been given under expedited review category 7 as outlined below:

(7) Research on individual or group characteristics or behavior (including, but not limited to, research on perception, cognition, motivation, identity, language, communication, cultural beliefs or practices, and social behavior) or research employing survey, interview, oral history, focus group, program evaluation, human factors evaluation, or quality assurance methodologies.

Your application will expire on April 21, 2012. If the study continues beyond that date, you must complete the IRB Renewal Application. If you modify the application, please complete the Modification of an Approved Protocol form. Changes in this study cannot be initiated without IRB approval, except when necessary to eliminate apparent immediate hazards to participants. When the study closes, please complete the Request for Study Closure form.

Should you need to submit any further correspondence regarding this application, please include the assigned IRB application number.

Good luck with your research.

Sincerely,

Signature Omitted

Director & Research Compliance ~~Officer~~ Officer
Office for Research Compliance
The University of Alabama

152 Rose Administration Building
Box 870117
Tuscaloosa, Alabama 35487-0117
(205) 348-8461
FAX (205) 348-8882
TOLL FREE (877) 820-3066

October 12, 2011

Office for Research

Institutional Review Board for the
Protection of Human Subjects

THE UNIVERSITY OF
ALABAMA
RESEARCH

Jeremy Searson
ELPTS
College of Education
The University of Alabama

Re: IRB# 11-OR-139 (Revision): "Concerns of Program Directors of Athletic Training Education Programs with the Innovations of Instructional Media and Instructional Design"

Dear Mr. Searson:

The University of Alabama Institutional Review Board has reviewed the revision to your previously approved expedited protocol. The board has approved the change in your protocol.

Please remember that your approval period expires one year from the date of your original approval, 4/22/11, not the date of this revision approval.

Should you need to submit any further correspondence regarding this proposal, please include the assigned IRB application number. Changes in this study cannot be initiated without IRB approval, except when necessary to eliminate apparent immediate hazards to participants.

Good luck with your research.

Signature Omitted

358 Rose Administration Building
Box 870127
Tuscaloosa, Alabama 35487-0127
(205) 348-8461
FAX (205) 348-7189
TOLL FREE (877) 820-3066

CONSENT TO PARTICIPATE IN RESEARCH

CONCERNS OF PROGRAM DIRECTORS OF ATHLETIC TRAINING EDUCATION PROGRAMS WITH THE INNOVATIONS OF INSTRUCTIONAL MEDIA AND INSTRUCTIONAL DESIGN

Jeremy R. Searson, MS, ATC
Clinical Coordinator, Athletic Training Education Program – University of South Carolina
Doctoral Student –University of Alabama

Dr. Angela Benson, Associate Professor
Program Coordinator, Instructional Technology Department of Educational Leadership, Policy, and Technology Studies – University of Alabama

You are being asked to take part in a research study.

Description of Study

Jeremy R. Searson, MS, ATC, Principal Investigator and a doctoral degree candidate at The University of Alabama, is conducting a study under the direction of Dr. Angela Benson. The study will identify program directors' definition of instructional technology, peak and secondary peak stages of concern, personal demographics, academic demographics, and innovation characteristics as they relate to instructional technology.

Taking part in this study involves completing a web survey that will take about twenty (20) minutes. This survey contains questions about your utilization of instructional technology within your athletic training education program and demographic information.

Procedures

If you volunteer to participate in this study, you will be asked to utilize a unique personal identifier to access and complete an online survey which will take approximately twenty (20) minutes.

Benefits of Participation

There will be no direct benefits to you for completing this survey. The findings will be useful to change facilitators within athletic training and higher education for understanding the concerns that Program Directors have with the utilization of instructional technology.

Risks of Participation

The unique identifier allows the Primary Investigator to connect the three unique survey sections of the study for analysis. The unique identifier will be kept in a secure location on a password protect computer and only the Primary Investigator will have access to this file. After the project window has closed the file containing contact information and the unique personal identifiers will be destroyed prior to the start of data analysis.

Confidentiality

Your confidentiality will be protected throughout this study. Participants will be asked to provide the unique personal identifier three times during the survey allowing the investigators to confirm completion and final data analysis. We will not collect your IP address at any point. The list of names, email addresses, and unique personal identifier will be stored electronically in a password protected folder. The primary investigator will destroy all files containing the unique identification numbers at the conclusion of the study. You may be contacted if a portion of the study was not completed to ensure it was not accidental bypassed. Only summarized data will be presented at meetings or in publications. All information gathered in this study will be kept completely confidential and secure. No reference will be made that could link you to this study.

Cost /Compensation

The study will take approximately twenty (20) minutes of your time. No compensation will be provided for your participation in the study.

UNIVERSITY OF ALABAMA IRB
CONSENT FORM APPROVED: 10/12/2011
EXPIRATION DATE: 4/21/2012

Contact Information

If you have questions about this study, please contact Jeremy R. Searson at 803.777.7175 or by email to searsojr@mailbox.sc.edu. This research is being conducted under the direction of Dr. Benson and she may also be contacted at 204-348-7824 or via email to abenson@bamaed.ua.edu.

If you have any questions about your rights as a research participant, you may contact Ms. Tanta Myles, The University of Alabama Research Compliance Officer, at 205-348-8461 or toll free at 1-877-820-3066.

Voluntary Participation

Your participation in this study is voluntary. You may refuse to participate in this study or in any part of this study. You may withdraw at any time without prejudice to your relations with the university. You are encouraged to ask questions about this study at the beginning or any time during the research study.

If you understand the statements above, are at least 19 years old, and freely consent to be in this study, click on the (NEXT) button to begin.

UNIVERSITY OF ALABAMA IRB
CONSENT FORM APPROVED: 10/12/2011
EXPIRATION DATE: 4/21/2012

Office for Research

Institutional Review Board for the
Protection of Human Subjects

THE UNIVERSITY OF
ALABAMA
R E S E A R C H

April 20, 2012

Jeremy Searson
Department of ELPTS
College of Education
Box 870302

Re: IRB#: 11-OR-139-R1 "Concerns of Program Directors of Athletic Training Education Programs with the Innovations of Instructional Media and Instructional Design"

Dear Mr. Searson

The University of Alabama Institutional Review Board has granted approval for your renewal application.

Your protocol has been given expedited approval according to 45 CFR part 46. Approval has been given under expedited review category 7 as outlined below:

(7) Research on individual or group characteristics or behavior (including, but not limited to, research on perception, cognition, motivation, identity, language, communication, cultural beliefs or practices, and social behavior) or research employing survey, interview, oral history, focus group, program evaluation, human factors evaluation, or quality assurance methodologies.

Your application will expire on April 19, 2013. If your research will continue beyond this date, complete the relevant portions of the IRB Renewal Application. If you wish to modify the application, complete the Modification of an Approved Protocol Form. Changes in this study cannot be initiated without IRB approval, except when necessary to eliminate apparent immediate hazards to participants. When the study closes, complete the appropriate portions of the IRB Request for Study Closure Form.

Should you need to submit any further correspondence regarding this proposal, please include the above application number.

Good luck with your research.

Signature Omitted

358 Rose Administration Building
Box 870127
Tuscaloosa, Alabama 35487-0127
(205) 348-8461
FAX (205) 348-7189
TOLL FREE (877) 820-3066

Appendix C - Correspondences

Invitation to participate.

Dear [FirstName] [LastName],

My name is Jeremy R. Searson and I am currently a doctoral degree candidate at The University of Alabama completing research under the direction of Dr. Angela Benson. I am contacting you today to inform you of an upcoming study I will be completing on the concerns of program directors in athletic training education programs with the utilization of instructional technology. The results of this study, excluding individual information, may be published for the benefit of not only educators in the field of athletic training but also our colleagues across the spectrum of higher education.

This study is based upon the Concern-Based Adoption Model. Utilizing the Stages of Concerns Questionnaire, an online survey, we will collect information on each individual program director's level of concern while engaged with the innovation of instructional technology. The information gained can provide athletic training educators, the National Athletic Training Association, the Commission on Accreditation of Athletic Training Education, and higher education administrators with information to tailor professional development opportunities in instructional technology and allow the field to reflect on the adoption and growth process as it pertains to instructional technology.

We will be most grateful if you take the time to complete the survey when it arrives. Your responses will be treated as confidential and your information will not be linked to your name. There is minimal risk associated with your participation in this survey. You participation will be voluntary and you will be able to discontinue participation at any point in time during the process. You may contact the primary investigator to opt out of the study if you do not wish to participate.

We appreciate your consideration to participate in this study and will be pleased to answer any questions you may have about the study. At the conclusion of the study we will also make findings available to all interested parties. If you have any questions please contact me via phone at 803.777.7175 or email to searsojr@mailbox.sc.edu. You can also contact the faculty advisor for this research, Angela Benson, PhD at 205.348.7824 or email to abenson@bamaed.ua.edu.

We appreciate your time and assistance in participating in this study.

Sincerely,

[Signature Image]

Jeremy R. Searson, MS, ATC
Clinical Coordinator, The University of South Carolina Athletic Training Education Program
Doctoral Candidate – The University of Alabama Educational Leadership, Policy, and Technology Studies

THE UNIVERSITY OF SOUTH CAROLINA
ATHLETIC TRAINING EDUCATION

Athletic Training Education Programs

University of South Carolina
1300 Wheat Street
218-P Blatt PE Center
Columbia, SC 29208
searsojr@mailbox.sc.edu
Phone: (803) 777-7175
Fax: (803) 777-6250

Athletic Training Education Programs' Website

Faculty Advisor Contact Information
Angela Benson, PhD
Faculty Advisor – The University of Alabama Educational Leadership, Policy, and Technology Studies
abenson@bamaed.ua.edu
Phone: 205.348.7824

Initial correspondence to initiate study.

Dear **[FirstName] [LastName]**,

My name is Jeremy R. Searson and I am currently a doctoral degree candidate at The University of Alabama completing research under the direction of Dr. Angela Benson. I am inviting you to participle in survey research examining the concerns of program directors in athletic training education programs with the utilization of instructional technology. The results of this study, excluding individual information, may be published for the benefit of educators across higher education.

Program directors in athletic training education programs are being asked to participate in this research; however, your participation is voluntary and you have the right to choose not to participate or to discontinue participation at any time. The University of Alabama Institutional Review Board has reviewed and approved this project.

The survey, entitled Stage of Concern of Program Directors with the Innovation of Instructional Technology, consists of 85 questions, which will take about twenty (20) minutes to complete. Minimal risk is posed by participating in this study as confidentiality will be maintained.

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We appreciate your time and assistance in participating in this study.

Sincerely,

[Signature Image]

Jeremy R. Searson, MS, ATC
Clinical Coordinator, The University of South Carolina Athletic Training Education Program
Doctoral Candidate – The University of Alabama Educational Leadership, Policy, and Technology Studies

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ATHLETIC TRAINING EDUCATION

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Phone: (803) 777-7175
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Faculty Advisor Contact Information
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Faculty Advisor – The University of Alabama Educational Leadership, Policy, and Technology Studies
abenson@bamaed.ua.edu
Phone: 205.348.7824

Second correspondence to compete study.

Dear [FirstName] [LastName]**,**

My name is Jeremy R. Searson and I am currently a doctoral degree candidate at The University of Alabama completing research under the direction of Dr. Angela Benson. Approximately a week ago, I requested your participation in survey examining the concerns of program directors in athletic training education programs with the utilization of instructional technology. The results of this study, excluding individual information, may be published for the benefit of educators across higher education.

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Additional correspondence sent to non-respondents.

Dear [FirstName] [LastName]**,**

My name is Jeremy R. Searson, a doctoral degree candidate at The University of Alabama. I am inviting you to participate in survey examining program directors in athletic training education programs and their utilization of instructional technology. Your participation is voluntary and you have the right to choose not to participate or discontinue participation at any time. The University of Alabama Institutional Review Board has reviewed and approved this project. The survey will take approximately twenty (20) minutes to complete and there is minimal risk posed by participating in this study as confidentiality will be maintained. The unique survey ID provides linkage between the three (3) unique survey instruments that are utilized in this study.
Please complete this survey at your earliest convenience.

To participate in the online survey:

1. Take note of your unique survey ID: **[access_number]**
2. Utilize the following link to take you to the survey **[survey_link]**
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Correspondence for individuals only completing a portion of the survey.

Dear [FirstName] [LastName]**,**
We appreciate your previous work on this survey evaluating Program Directors utilization of Instructional Technology, however it was incomplete. We would like to give you the opportunity to complete the final section of the survey by Tuesday, November 11, 2011. The third portion of the survey, while similar in appearance to the second portion, evaluates the instructional design component of the study. If you can take the time to complete the last section of survey it would be greatly appreciated. IT should take approximately five (5) minutes to complete.
Please complete this survey at your earliest convenience.

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Appendix D - Survey Instrument

Personal demographic questions.

1. What is your Gender?

_____Male _____Female

2. What range best represents your age?

_____20-29 _____30-39 _____40-49 _____50-59 _____60-69

Academic demographic questions.

3. What is your current tenure status?

_____Clinical/Non-Tenure _____Tenure-Track _____Tenured _____Adjunct

_____Other

4. What is your current academic rank?

_____Adjunct Instructor _____Instructor _____Assistant Professor

_____Associate Professor _____Full Professor _____Other

5. What is the highest degree you have earned?

_____Bachelors' _____Masters' _____Doctorate _____Other

6. What is your average course load per semester over the last calendar year?

_____0-3 hours per semester _____3-6 hours per semester

_____7-9 hours per semester _____10-12 hours per semester

_____13-15 hours per semester _____Other

7. How much teaching experience do you have at the collegiate or university level?

_____0-5 years _____6-10 years _____11-20 years

_____21-30 years _____31- higher years

7. What is the Basic Carnegie Level of your institution?

_____*RU/VH*: Research Universities (very high research activity)

_____*RU/H*: Research Universities (high research activity)

_____*DRU*: Doctoral/Research Universities

_____*Master's L*: Master's Colleges and Universities (larger programs)

_____*Master's M*: Master's Colleges and Universities (medium programs)

_____*Master's S*: Master's Colleges and Universities (smaller programs)

_____*Bac/A&S*: Baccalaureate Colleges--Arts & Sciences

_____*Bac/Diverse*: Baccalaureate Colleges--Diverse Fields

_____*Bac/Assoc*: Baccalaureate/Associate's Colleges

_____I do not know

Innovation characteristic questions.

9. Which definition best describes the field of Instructional Technology?

_____Instructional technology is a field that is concerned with the design, development, utilization, management, and evaluation of the processes and resources for learning.

_____Instructional technology is the physical means by which instruction is presented to learners.

_____Instructional technology is the analysis of instructional problems, and the design, development, implementation and evaluation of instructional procedures and materials intended to solve those problems.

10. In your use of instructional media, do you consider yourself to be a:

_____non-user _____novice _____intermediate _____old hand

_____ past user

11. In your use of instructional design, do you consider yourself to be a:

_____non-user _____novice _____intermediate _____old hand

_____ past user

12. Which of the following types of professional development/continuing education have you participated with instructional media as the focus?

_____audiotapes	_____Book Clubs	_____Videoconference
_____Podcast	_____Job Shadowing	_____Lecture
_____Satellite Broadcast	_____On-site Technical Assistance	_____Seminar
_____Study Group	_____Teleconferences	_____Television Course
_____Web-based Course	_____University Education Course	_____Workshop
_____ Regional Conference	_____ National Conference	_____ None

13. Which of the following types of professional development/continuing education have you participated with instructional design as the focus?

_____audiotapes	_____Book Clubs	_____Videoconference
_____Podcast	_____Job Shadowing	_____Lecture
_____Satellite Broadcast	_____On-site Technical Assistance	_____Seminar
_____Study Group	_____Teleconferences	_____Television Course
_____Web-based Course	_____University Education Course	_____Workshop
_____ Regional Conference	_____ National Conference	_____ None

SoCQ evaluating instructional media.

0	1	2	3	4	5	6	7
Irrelevant	Not True of me now		Somewhat true of me now			Very true of me now	

14. I am concerned about students' attitudes toward the INSTRUCTIONAL MEDIA.	0 1 2 3 4 5 6 7
15. I now know of some other approaches that might work better.	0 1 2 3 4 5 6 7
16. I am more concerned about another INSTRUCTIONAL MEDIA.	0 1 2 3 4 5 6 7
17. I am concerned about not having enough time to organize myself each day.	0 1 2 3 4 5 6 7
18. I would like to help other faculty in their use of the INSTRUCTIONAL MEDIA.	0 1 2 3 4 5 6 7
19. I have a very limited knowledge of the INSTRUCTIONAL MEDIA.	0 1 2 3 4 5 6 7

20. I would like to know the effect of reorganization on my professional status. 0 1 2 3 4 5 6 7

21. I am concerned about conflict between my interests and my responsibilities. 0 1 2 3 4 5 6 7

22. I am concerned about revising my use of the INSTRUCTIONAL MEDIA. 0 1 2 3 4 5 6 7

23. I would like to develop working relationships with both our faculty and outside faculty using this INSTRUCTIONAL MEDIA. 0 1 2 3 4 5 6 7

24. I am concerned about how the INSTRUCTIONAL MEDIA affects students. 0 1 2 3 4 5 6 7

25. I am not concerned about the INSTRUCTIONAL MEDIA at this time. 0 1 2 3 4 5 6 7

26. I would like to know who will make the decisions in the new system. 0 1 2 3 4 5 6 7

27. I would like to discuss the possibility of using the INSTRUCTIONAL MEDIA. 0 1 2 3 4 5 6 7

28. I would like to know what resources are available if we decide to adopt the INSTRUCTIONAL MEDIA 0 1 2 3 4 5 6 7

29. I am concerned about my inability to manage all that the INSTRUCTIONAL MEDIA requires. 0 1 2 3 4 5 6 7

30. I would like to know how my teaching or administration is supposed to change. 0 1 2 3 4 5 6 7

31. I would like to familiarize other departments or persons with the 0 1 2 3 4 5 6 7

progress of this new approach.

32. I am concerned about evaluating my impact on students.	0 1 2 3 4 5 6 7
33. I would like to revise the INSTRUCTIONAL MEDIA's approach.	0 1 2 3 4 5 6 7
34. I am preoccupied with things other than the INSTRUCTIONAL MEDIA.	0 1 2 3 4 5 6 7
35. I would like to modify our use of the INSTRUCTIONAL MEDIA based on the experiences of our students.	0 1 2 3 4 5 6 7
36. I spend little time thinking about the INSTRUCTIONAL MEDIA.	0 1 2 3 4 5 6 7
37. I would like to excite my students about their part in this approach.	0 1 2 3 4 5 6 7
38. I am concerned about time spent working with nonacademic problems related to the INSTRUCTIONAL MEDIA.	0 1 2 3 4 5 6 7
39. I would like to know what the use of the INSTRUCTIONAL MEDIA will require in the immediate future.	0 1 2 3 4 5 6 7
40. I would like to coordinate my efforts with others to maximize the INSTRUCTIONAL MEDIA's effects.	0 1 2 3 4 5 6 7
41. I would like to have more information on time and energy commitments required by the INSTRUCTIONAL MEDIA.	0 1 2 3 4 5 6 7
42. I would like to know what other faculty are doing in this area.	0 1 2 3 4 5 6 7
43. Currently, other priorities prevent me from focusing my attention on the INSTRUCTIONAL MEDIA.	0 1 2 3 4 5 6 7
44. I would like to determine how to supplement, enhance, or replace the INSTRUCTIONAL MEDIA.	0 1 2 3 4 5 6 7
45. I would like to use feedback from students to change the program.	0 1 2 3 4 5 6 7

46. I would like to know how my role will change when I am using the INSTRUCTIONAL MEDIA. 0 1 2 3 4 5 6 7

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

48. I would like to know how the INSTRUCTIONAL MEDIA is better than what we have now. 0 1 2 3 4 5 6 7

SoCQ evaluating instructional design.

0	1	2	3	4	5	6	7
Irrelevant	Not True of me now		Somewhat true of me now			Very true of me now	

49. I am concerned about students' attitudes toward the INSTRUCTIONAL DESIGN.	0 1 2 3 4 5 6 7
50. I now know of some other approaches that might work better.	0 1 2 3 4 5 6 7
51. I am more concerned about another INSTRUCTIONALDESIGN.	0 1 2 3 4 5 6 7
52. I am concerned about not having enough time to organize myself each day.	0 1 2 3 4 5 6 7
53. I would like to help other faculty in their use of the INSTRUCTIONALDESIGN.	0 1 2 3 4 5 6 7
54. I have a very limited knowledge of the INSTRUCTIONALDESIGN.	0 1 2 3 4 5 6 7
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60. I am not concerned about the INSTRUCTIONALDESIGN at this time.	0 1 2 3 4 5 6 7
61. I would like to know who will make the decisions in the new system.	0 1 2 3 4 5 6 7
62. I would like to discuss the possibility of using the INSTRUCTIONALDESIGN.	0 1 2 3 4 5 6 7
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