A STUDY OF ATHLETIC TRAINING EDUCATION FACULTY ATTITUDES’ TOWARD INSTRUCTIONAL TECHNOLOGY AND THEIR EXTENT OF UTILIZATION OF THAT TECHNOLOGY

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This dissertation entitled
A STUDY OF ATHLETIC TRAINING EDUCATION FACULTY ATTITUDES’ TOWARD INSTRUCTIONAL TECHNOLOGY AND THEIR EXTENT OF UTILIZATION OF THAT TECHNOLOGY

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Technology has become an integral part of American society, and its role in education has continued to increase. The purpose of this study is to examine athletic training educators’ attitudes toward instructional technology and their extent of utilization of that technology. Attitudes and extent of utilization are examined to determine whether differences exist among participants based on their gender and age.

Participants were certified athletic trainers teaching in entry-level athletic training education programs accredited by the Commission on Accreditation of Allied Health Education Programs (CAAHEP). Data were collected from 260 participants using an on-line questionnaire developed by the researcher. The questionnaire contained three sections, including demographic information, attitudes toward instructional technology and instructional technology use. Internal consistency of the attitude and extent of utilization sections yielded alpha coefficients of .90 and .91 respectively.
The research design was a two-way analysis of variance (ANOVA) utilizing summated scores for attitudes toward and extent of utilization of instructional technology as the dependent measures. The independent variables were gender and age. Data analyses revealed no statistically significant differences for each of the main effects of gender and age or for the interaction effect of gender and age and attitudes toward instructional technology. Additionally, data revealed no significant differences for each of the main effects of gender and age and extent of utilization of instructional technology. However, a significant finding is noted for the interaction of gender and age and extent of utilization. Further review indicates males 57 years of age and older utilize instructional technologies to a greater extent than females in the same age group. However, females between the ages of 46 and 56 utilize instructional technologies to a greater extent than males in the same age group.

Limitations, conclusions, practical implications, and recommendations for further study are provided.

Approved: Robert Young

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Chapter One: Introduction

*Background of the Study*

Technology has become an integral part of American society. It is increasingly being used for entertainment, business, and education (Hogle, 1999). Technology has developed into a way of life for younger and older adults, and has been advertised as a necessity for enhanced lifestyles, improved working environments, and enriched learning (Hogle, 1999; O'Banion, 1997b). Many individuals begin their day by "logging on" and checking to see whether they have received any new electronic mail (e-mail). In September 2001 the United States Census Bureau reported that 174 million people (66% of the population) in the United States used computers (United States Department of Commerce [USDC], 2002). Additionally, 143 million Americans (54% of the population) were using the Internet. “Not only are many more Americans using the Internet and computers at home, they are also using them at work, school, and other locations for an expanding variety of purposes” (USDC, p. 1).

Debate has long existed about the value of technology within the educational environment; however, the public has seemingly accepted its role in education (Hogle, 1999). Sales of educational software and home computers continue to rise. In a 1996 survey of the use of information technology in higher education Green, the founder and director of The
Campus Computing Project, reported increasing levels of computer ownership by college students and faculty (Green, 1996). The majority of incoming freshmen have had some type of computer training in high school. Furthermore, a report based on U. S. Census Bureau data from September 2001 stated that 90% of all children between the ages of five and 17 reported using computers (U. S. Department of Commerce, 2002). "Investments in instructional technology (IT) related software and hardware on college campuses were an estimated $400 per student in 1993," (Hogle, p. 1) with the value expected to continue to increase. Green (2001) reported nearly three-fourths of all college and university students across the United States own a desktop or laptop computer. Furthermore, many colleges and universities are mandating policies to ensure universal student access to technology. Some colleges and universities, including Sonoma State University, are requiring all incoming students to possess (either by owning or leasing) a computer (Oblinger, Resmer, & Mingle, 1998). Other colleges and universities, such as the University of Minnesota at Crookston and Wake Forest University, are providing notebook or desktop computers, along with training in the use of technology, for each student (Oblinger et al.).

Technological competence is increasingly becoming a requirement in the workplace (Beggs, 2000; Oblinger et al., 1998). The incorporation of technology into higher education and the learning process is important
to prepare students for the current and future workforce. In order for students to be ready for productive careers, higher education must provide them with suitable tools, techniques, and information (Oblinger et al.). In 1997, Oblinger and Rush reported that 65% of workers used some type of information technology in their jobs, and they further predicted this number would increase to 95% by the year 2000; however, no further updated data were found to corroborate this forecast.

Flatley and Hunter (1995) suggested technology is increasingly being utilized by academics to support intellectual tasks. They stressed the significance of technology in the classroom by stating following:

In writing about this new electronic age, one might use the analogy of the opening of the electronic frontier as being similar to the impact the railroad had in opening up the West or to the discovery of electricity or the invention of the automobile. In any case it is an exciting new territory that will capture students interest and give instructors one of the most powerful teaching tools ever (Flatley & Hunter, 1995, p. 74).

The emphasis placed on technology in higher education should be of increased importance, considering access to information is a large part of the educational process (Oblinger & Rush, 1997). However, faculty, as a group, have been slow to integrate instructional technologies (Ely,
1995; Hogle, 1999). Oblinger and Rush reported in 1997 that a formal plan for integrating technology into the curriculum existed at only one-fourth of institutions of higher education in the United States. Furthermore, they suggested less than 25% of classes used technology resources and only 10% used the Internet or World Wide Web.

Technology is a sophisticated and complex tool that incorporates the media of communication (Ely, 1995; O'Banion, 1997b). It can enhance and expand the learning environment, when technology supports current practices and a content-rich curriculum. “Since the application of motion picture technology in educational settings a hundred years ago, technology has provided teachers with increasingly powerful tools to enrich the learning environment” (Kizzier, 1995, p.12). These new educational tools can be utilized to improve the learning environment by providing means of obtaining and transmitting information combined with methods of enriching human interaction.

One specific area of technology in education is termed instructional technology. Instructional technology has been defined in several ways; however, a common link between definitions exists (Gentry, 1995). “Instructional technology involves two components: a media for communication and a process or means of applying resources to enhance learning” (Gentry, p. 7). New instructional technologies are continually
being introduced and old technologies are frequently being upgraded and are becoming more advanced.

This researcher was interested in determining attitudes toward and the extent of utilization of instructional technology in the higher education discipline of athletic training education. A survey developed by the researcher was utilized to gather information from faculty within entry-level athletic training education programs accredited by the Commission on Accreditation of Allied Health Education Programs (CAAHEP). The survey consisted of items to collect demographic information and attitudes toward instructional technology. Additionally, the survey included items to determine the extent to which particular forms of instructional technologies are being utilized.

In recent years, athletic training education has undergone significant educational reform. In part, this educational reform has resulted in an increased awareness of the importance of integrating technology into athletic training education. Additionally, current literature emphasizes the importance of technology within the athletic training profession. As Valerie Hunt (2003) stated, “in athletic training, technology plays a part in everything from how certified athletic trainers treat their patients to how they prepare their students” (p. 10).

During the 1980's, the National Athletic Trainers' Association (NATA) developed the Audiovisual Committee, now the NATA
Educational Multimedia Committee (NATA-EMC) (T. Lindley, personal communication, January 30, 2003). Part of the NATA-EMC’s mission includes providing NATA members with information regarding educational multimedia products, including videos and computer based software (JRC-AT: Joint Review Committee on Educational Programs in Athletic Training [JRC-AT], 2004; T. Lindley, personal communication, January 30, 2003). The development of this committee illustrates the importance of instructional technology within athletic training education programs.

Statement of the Problem and Purpose of the Study

Little research and few data existed regarding attitudes toward and the role of instructional technology in athletic training education programs. As a result, not enough was known about faculty attitudes’ toward and the extent of utilization of instructional technology. The purpose of this study was to determine athletic training educators’ attitudes toward and extent of utilization of instructional technology techniques in CAAHEP-accredited, entry-level athletic training education programs within the United States.

Research Questions

In this study the researcher gave consideration to the following research questions:
1. What are the demographics of the respondents (gender, highest degree earned, rank of current position, and age)?

2. What are athletic training educators’ attitudes toward instructional technology?

3. To what extent do athletic training educators utilize instructional technology in their teaching?

4. Is there a difference between male and female athletic training educators’ attitudes toward instructional technology?

5. Is there a difference between athletic training educators’ attitudes toward instructional technology based on age?

6. Is there an interaction effect between age and gender and attitudes toward instructional technology?

7. Is there a difference between male and female athletic training educators’ extent of utilization of instructional technology in their teaching?

8. Is there a difference between athletic training educators’ extent of utilization of instructional technology in their teaching based on age?

9. Is there an interaction effect between age and gender and extent of utilization of instructional technology?
Null Hypotheses

Descriptive statistics were provided for Questions One, Two, and Three. Additionally, the following null hypotheses were tested for Questions Four through Nine:

HO₁: There are no significant differences between male and female athletic training educators’ attitudes toward instructional technology. (Question Four)

HO₂: There are no significant differences in athletic training educators’ attitudes toward instructional technology based on age. (Question Five)

HO₃: There is no interaction effect between age and gender and attitudes toward instructional technology. (Question Six)

HO₄: There are no significant differences between male and female athletic training educators’ extent of utilization of instructional technology in their teaching. (Question Seven)

HO₅: There are no significant differences in athletic training educators’ extent of utilization of instructional technology in their teaching based on age. (Question Eight)

HO₆: There is no interaction effect between age and gender and extent of utilization of instructional technology. (Question Nine)
Significance

Technology is being used within higher education to assist in making teaching more efficient and effective (Gross Davis, 1993). Its influence and role in the profession of athletic training are ever expanding, including in the education sector (Hunt, 2003). Within athletic training education, faculty members are beginning to utilize instructional technology in designing and implementing their curriculum (Gould, Ransome, Conry, & Chan, 1995; Hunt; Speitel & Buxton, 1995; Wiksten, Spanjer & LaMaster, 2002). Additionally, research indicates that a top technology issue on several campuses nationwide is faculty integration of technology into instruction (Beggs, 2000; Green, 2001).

Little research has been done and hence few data exist regarding the diffusion of instructional technology within higher education in general and more specifically within the academic area of athletic training education (Hogle, 1999; Hunt, 2003). Extensive research utilizing ERIC, Digital Dissertations, Medline, Sports Discus, Wilson Select Plus, FirstSearch, ProQuest Databases, and Social Science Index yielded limited studies providing data on the extent of utilization of instructional technology by athletic training education faculty. In one particular study, researchers focused solely on the utilization of and faculty attitudes toward computer-based instruction (Fincher & Wright, 1996). In another study, researchers gathered baseline data
regarding the use of technology tools in the classroom, the use of
technology tools in administering the educational proficiencies, personal
comfort with technology, and personal awareness of on-campus
technology services (Hunt, 2003). This study provided useful
information, however, extent of utilization was limited and faculty
attitudes were not measured. Additional research focused on various
other aspects of technology within educational settings.

This researcher believed it was important to study attitudes toward
and extent of utilization of instructional technology in athletic training
education, in part to help determine strategies for the improvement of
athletic training education. Therefore, this study attempted to increase
the knowledge base regarding faculty attitudes toward the use of
instructional technology and the extent of utilization of that technology
in CAAHEP-accredited, entry-level athletic training education programs
in the United States. Information gained from this study yielded data
regarding faculty attitudes toward and extent of utilization of
instructional technology. Findings provided a baseline for further
research in this subject matter for athletic training educators.
Furthermore, findings from this study provided data regarding
differences and similarities among athletic training educators based on
demographic characteristics. Additionally, it is hoped that the
quantification of differences will lead to strategies to help reduce the
negative impact on implementation of technological innovations. Where no differences were determined, some of the obvious targets for explaining differences (i.e. gender and age) have been eliminated. Findings and conclusions from this research will be useful for all educators within the higher education setting when implementing instructional technology into curricula.

Delimitations of the Study

The study was subject to the following delimitations:

1. The study was delimited to individuals teaching within the 243 CAAHEP-accredited, entry-level athletic training education programs at institutions of higher education in the United States as of January 2004.

2. The study was delimited to educators who are athletic trainers certified by the National Athletic Trainers’ Association Board of Certification (NATA-BOC).

3. The study was delimited to educators teaching at least one athletic training course during the 2003-2004 academic year.

4. The study was delimited to educators who have a current e-mail address.

Limitations of the Study

1. Data were collected through a survey instrument and were limited to 260 responses as provided by those surveyed.
2. Using a survey with self-reporting assumes subjects will respond truthfully; therefore, it may only allow for limited accountability and honesty in individual responses.

*Definition of Terms*

The following terms are defined for clarity purposes:

*Athletic Training Education Programs:* Entry-level, degree-granting programs specializing in the discipline of athletic training that are accredited by CAAHEP in which, upon successful completion, students are eligible to sit for the NATA Board of Certification exam (NATA, 2003).

*Commission on Accreditation of Allied Health Education Programs (CAAHEP):* A non-profit agency that "...accredits programs representing 18 allied health professions recognizing over 1900 allied health education programs in more than 1300 institutions" (JRC-AT, 2004).

*Certified athletic trainer (ATC):* A highly educated and skilled professional specializing in athletic health care (Hillman, 2000).

*Instructional Technology:* "the systemic and systematic application of strategies and techniques derived from behavior and physical sciences concepts and other knowledge to the solution of instructional problems" (Gentry, 1995, p. 7).

*National Athletic Trainers’ Association (NATA):* The organizing body of athletic trainers in the United States, with a mission "...to enhance the quality of health care for athletes and those engaged in physical activity,
and to advance the profession of athletic training through education and research in the prevention, evaluation, management, and rehabilitation of injuries" (NATA, 2003).

**TELEform:** A high volume information capture tool. Its eForm option allows an individual to convert paper forms into online data collection forms (Cardiff, 2004).
Chapter Two: Review of the Literature

Introduction to the Literature

Many technological advances have been made during the past fifty years. As general advances have occurred, educators have looked to incorporate technology into the classroom setting, and research in this area has increased. This chapter will provide an overview of athletic training education and relevant literature on instructional technology. The review will begin with an introduction to the meanings and definitions of instructional technology. This will be followed by a review of the positive and negative aspects of utilizing instructional technology, faculty adoption and utilization of instructional technology, and uses and forms of instructional technology. Differences in attitudes and utilization among faculty will then be explored. Next, a review of research on attitudes toward and utilization of instructional technology on college and university campuses, at particular institutions of higher education and within specific academic disciplines will be provided. Finally, a summary of athletic training education and the use of instructional technology within this discipline will be explored.

Critical Review of Relevant Literature

Instructional Technology

Before beginning a critical review of instructional technology, it is important to discuss its definition. Several researchers provided varying
definitions and a shared, precise meaning has yet to be accepted, however, similarities in definitions do exist (Gentry, 1995).

The Commission on Instructional Technology provided two definitions of instructional technology in a 1970 Report. The first definition referred to instructional technology as "...the media born of the communications revolution which can be used for instructional purposes alongside the teacher, textbook, and blackboard" (p. 21). The second, broader definition of instructional technology was "...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 communication, and employing a combination of human and nonhuman resources to bring about more effective instruction" (p. 21). The first definition involves the actual technological implements used, while the second focuses more on process.

Likewise in 1972, David Engler provided two distinct definitions of instructional technology (Gentry, 1995). The first was hardware or implements of communication. Current examples for Engler's first definition include televisions, textbooks, blackboards, compact discs, scanners, projection devices, and the like. Secondly, Engler defined instructional technology, "...as a process by means of which we apply the research findings of the behavioral sciences to the problems of instruction" (Gentry, 1995, p. 5). Engler's definitions also involved
technology tools as well as a process of implementation and design into instruction.

Cass Gentry (1995) provided a more current interpretation of instructional technology by stating it is "the systemic and systematic application of strategies and techniques derived from behavior and physical sciences concepts and other knowledge to the solution of instructional problems" (p. 7). To Gentry, a specific meaning depends on what project is being focused on or what point is being made at the time. Finally, Ely (1995) emphasized the importance of applying scientific principles to solve practical problems when defining instructional technology.

Many focus on hardware and software when discussing instructional technology as opposed to systematic applications, techniques, and methods of instruction. For the sake of this project, the researcher has adapted a relatively broad view of instructional technology including both elements: equipment and techniques of instructional technology.

Positive Aspects of Instructional Technology

Advocates believe there are many advantages for the use of instructional technology. One advantage is flexibility (O'Banion, 1997b; Wiksten et al., 2002). Instructional technology offers flexibility in the structuring of academic courses, the gathering and presenting of course
information, and the methods of communication between instructors and students.

Students have diverse learning styles, thus faculty must employ various methods of instruction in order to maximize learning from all students. Instructional technology enables the instructor to incorporate several forms of teaching techniques and styles (O’Banion, 1997a; Passerini & Granger, 2000; Wiksten et al., 2002). When the instructor is able to combine several techniques, students are more likely to comprehend and utilize information to a greater extent. Incorporating several media types of instruction can maximize the benefits each medium offers the learning environment (Passerini & Granger).

"Technology can be used to individualize lessons, thus improving the quality of learning and for some students increasing the amount of education available in a given time frame" (Garland, 1995, p. 283). This concept is important when recognizing students have varying levels of intelligence and styles of learning. Instructors can direct instructional technology toward differences in students' abilities and improve the learning environment for every student.

In addition, research has indicated "...learners learn best by doing, by working on real problems in real environments" (O'Banion, 1997a, p. 81). Instructional technology can assist in providing a more realistic and
better-suited environment for students to learn. This in turn may have a
greater carry-over to applying knowledge to “real world” situations.

Doucette (1994) reported that technology could greatly enhance
communication between students and faculty and students and
students. Students less likely to speak up in class are offered a less
threatening means of expressing their opinions. Students have the
convenience of e-mailing faculty with questions whenever they think of
them (Oblinger et al., 1998). Additionally, instructors can address
questions and issues that come up outside of the classroom setting
through e-mail and discussion postings.

Technology can provide access to an enormous amount of
information and current sources (O'Banion 1997b). Information around
the world is easily accessible through means such as the World Wide
Web, therefore increasing material available for course development and
delivery. The ability of instructors to tailor educational resources to the
diverse needs of students combined with the availability and accessibility
of information through technology is believed to be important to
transforming the learning process from one of teacher-centered to one of
learner-centered or student-centered. This may allow the instructor's
role to shift from "knowledge dispenser" to "learning facilitator"
(Doucette, 1994; Kizzier, 1995; O'Banion, 1997b; Oblinger et al., 1998;
Wiksten et al., 2002). Students no longer have to store large amounts of
information in their minds (Doucette). They are freer to develop the ability to analyze, integrate, solve, apply, and essentially learn by using information.

Robert Kozma and Jerome Johnston (1991) presented literature to support the idea of information technology enhancing and transforming the teaching and learning environment. They identify seven methods that are summarized below:

1. Technology allows students to move from passive reception of information to active engagement in knowledge;
2. Technology helps decrease barriers between classroom and real world situations;
3. Technology expands the ability to express ideas from text to multiple representations;
4. Technology helps one go from simply covering information to mastering the information;
5. Technology has helped change the view of learning as an individual act toward learning as a collaborative effort;
6. Technology helps move past a concern with products of academic works towards a concern for the processes that create knowledge;
7. Technology provides a media for experimentation outside of the laboratory setting (Kozma & Johnston, 1991).
Negative Aspects of Instructional Technology

With the implementation of new technologies comes change. When change becomes an issue, uncertainty is often created (Garland, 1995). Resistance is often met when faculty are faced with uncertainty towards a new concept within an old tradition of learning and education. Resistance is enhanced when faculty believe things are working well "as is." Some may not be easily convinced that new, untried methods are worth the risk.

Faculty members oppose the use of technology in education for several reasons. These include "...loss of jobs, compensation for time spent in learning to use technology, intellectual property rights, institutional support for new projects, and workloads" (O'Banion, 1997b, p. 66). They are apprehensive about education becoming more depersonalized when personal interaction between students and instructors is de-emphasized. Additional worry lies in the quality of interaction that takes place. Non-supporters suggest technology decreases personal connections between instructors and students.

Critics of technology in higher education think it diminishes productivity while supporters suggest that productivity will be enhanced (O'Banion, 1997b). Productivity may increase by allowing the same number of faculty to teach to more students and/or allowing fewer faculty members to teach the same number of students. Green and
Gilbert (1995) argue that, "relatively few would claim-any real gains in instructional productivity. In that realm, as ever, we're still left with the 'promise' of technology" (p. 10).

The issue of cost is also a concern and can become a barrier to the acceptance of instructional technology (Garland, 1995). The availability of and access to equipment and software may be a problem. Furthermore, formal training and/or self-teaching are important in understanding and properly utilizing technology, thus, faculty must find time in their busy schedules to learn new techniques and design new teaching methods.

Faculty extend additional barriers to utilization of instructional technology. These include the possibility of students becoming distracted by the technology, insufficient hardware and software, inadequate facilities or support, and an underestimation of the difficulty in implementing technology into instruction (Baldwin, 1998; Garland, 1995).

*Faculty Adoption and Utilization of Instructional Technology*

Kozma and Johnston (1991) reported personal and collaborative preferences for adoption of instructional technology innovations. The majority of innovations were found to be personal adoptions, where individuals made a personal decision to incorporate technology. Typically, personal adoptions were motivated by factors including a
desire for promotion or a commitment to a particular teaching approach. Personal adoptions had a tendency to become discontinued or reduced when the individual faculty member became bored with the technology and became interested in other activities. The second, less common motivation for innovations, often constructed by individual academic departments, were those constructed collaboratively. The motivations for collaborative innovations were more likely to be a need of the organization or of students, as opposed to the personal needs of a single faculty member. Kozma and Johnston noted that collaborative innovations had a tendency to be continued and expanded over time.

Ely (1995) suggested faculty members are the most important factor leading to the implementation of technology for learning. Studies in the 1990's indicated that 95% of the faculty had used computers and 65% had access to other forms of interactive media, however, there was no indication of whether usage was specifically for instruction (Adam & Wilson, 1996). Additionally, despite the high percentages of possession of and access to instructional technology, Ely proposed widespread use and implementation have not occurred.

On the other hand, Charles Moran (1998) suggested the majority of faculty have minimal access to technology. Moran stated there is little support available for faculty to appropriately utilize technology in their teaching. Furthermore, Moran reported most institutions of higher
education do not have a plan in place for faculty and students to appropriately integrate technology into the teaching and learning process.

Barbara Gross Davis (1993) noted an increasing number of faculty members are using technology to make teaching more efficient, effective, powerful, and flexible. However, O’Banion (1997b) reported that no more than 10% of faculty had used technology in the classroom even though about half of all faculty members own personal computers. Usually faculty use technology to simply speed up routine activities, for example word processing and presentation of lecture material (Gross Davis; Hogle, 1999; O’Banion, 1997b). Additionally, it has been reported that few faculty are willing or even desire to use technology to change the concept of the classroom, even though this is where instructional technology could have its greatest impact (Gross Davis; Hogle).

In a 1996 report, Green stated that, “...information technology has finally emerged as a permanent, respected, and increasingly essential component of the college experience” (p. 24). Green (1996, 2000, 2001) indicated technology is increasingly being utilized as an instructional resource, not just by early adopters, but also by mainstream faculty. Low-tech applications, including e-mail, word processing and presentation software are among the most utilized forms of technology used by faculty and students. However, Green (1996, 2000, 2001)
further indicated an increasing number of faculty and students have practice with technology beyond simple activities, including experiences that extend the curriculum and enhance the learning environment.

A question remains regarding the diffusion of instructional technology. Research has typically focused on the adoption of a single innovation, instead of the general diffusion of instructional technology within higher education (Hogle, 1999). With little research and hence few data regarding diffusion, researchers in education are concerned whether or not diffusion of integration towards instructional technology is taking place (Hogle).

*Uses For and Forms of Instructional Technology*

Doucette (1994) characterized two uses of technology in instructional settings. Although he was referring to the community college system, this researcher believes the characterizations apply to the four-year college/university system. First, Doucette suggested that instructional technology could improve practices by automating processes. This allows faculty and students alike to do better what they already know how to do. Second, instructional technology can transform the process of how faculty teach and how students learn. Doucette agrees with O'Banion (1997b) that most of its uses fit the first category. However, more transformational instructional technology techniques are beginning to enter mainstream higher education usage (Doucette).
Numerous uses exist in both of Doucette's categories for instructional technology. As Gross Davis (1993) stated, "Computers can help you transform course notes into overheads, create high-quality complex illustrations, do real-time calculations and processing, engage students in interactive collaborations, and bring text, graphics, animation, sound, and video into the classroom" (p. 334).

O'Brien (cited in Gross Davis, 1993) has identified four reasons, or uses, for incorporating computers into instruction. O'Brien suggests instructional technology can be used:

1. To increase the amount of material in the course;
2. To treat course content in a different way;
3. To present demonstrations that cannot be done with traditional instructional tools;
4. To enhance course content by presenting hypothetical scenarios (Gross Davis, 1993, p. 335).

New technologies continue to be developed and older technologies continue to increase in sophistication as new methods for employing older technologies in education are explored (Kizzier, 1995). As advances have occurred a tremendous variety of instructional technologies has become available, hence an extensive list of instructional technologies including hardware and software programs exists. "Educators are offered a tremendous opportunity as well as a challenge to discover ways
to effectively employ this vast array of complex technology" (Kizzier, 1995, p.22). Therefore, it becomes the responsibility of instructors to determine appropriate methods to utilize these significant tools to enhance the learning environment.

Differences Among Faculty

Anderson, Varnhagen, and Campbell (1998) noted most professional development and support efforts regarding instructional technology have been oriented towards early adopters of technology and hence have had little applicability to mainstream faculty (MF). Anderson et al. suggested, “different approaches are needed to cause larger scale increases in the use of instructional technology by MF” (p. 74). However, differences between faculty groups must be identified before appropriate strategies can be implemented. The following section will explore current literature regarding differences between faculty groups based on gender and age.

Gender differences. Research regarding possible gender differences in education, computer use, and attitudes towards computers is abundant (Campbell & Varnhagen, 2002; Lebediker, 1997; Lucas, 2002; Schifter, 2002; Spotts, Bowman, & Mertz, 1997). Generally, research has supported the idea that females have less experience with and a more negative attitude towards computers than their male counterparts (Campbell & Varnhagen; Spotts et al.). This idea is further emphasized
as Campbell and Varnhagen outlined a few important concepts determined from past research regarding computers and gender issues:

1. Males have traditionally had better access to technology;
2. Achievement and motivation have been related to access of technology;
3. When confronted with instructional technology, female self-efficacy has been lower than males;
4. Delivery technology (the technology used to distribute instruction to students) has been presented in “gendered” terms that tend to be male oriented (p. 36).

Little data exist regarding research focusing on possible differences among faculty in respect to extent of utilization of and attitudes toward instructional technology (Campbell & Varnhagen; Spotts et al.). Dated literature focuses on computer use while more recent research focuses specifically on distance education. Campbell and Varnhagen and Spotts and others are current researchers who have attempted to provide data specific to faculty usage of and attitudes toward instructional technology.

At the University of Alberta, faculty were surveyed regarding instructional technology over three or more academic years (1997-98, 1998-99, 1999-2000). Campbell and Varnhagen (2002) reported on gender differences from respondents of the 1999-2000 survey. The survey was mailed to 2041 full-time faculty with a return rate of 21%.
Campbell and Varnhagen noted women faculty utilize different instructional technologies for differing purposes than their male colleagues. They suggested females emphasized instructional methodology and males placed greater consideration on delivery technologies, i.e. the hardware and software used to distribute instruction to students. Their findings regarding gender issues were summarized as,

“we believe that women faculty are more inclined to use learning technologies, when they fit with existing instructional goals for the purposes of:

1. increasing contact with their students, and with their colleagues;
2. encouraging interpersonal contact among their students;
3. supporting a view of knowledge as co-constructed with others, and as available from alternative sources;
4. supporting diverse learning styles; and
5. exploring alternative teaching approaches” (p. 49).

Spotts (et al., 1997) conducted research to determine whether female faculty use instructional technology in the same manner as their male colleagues. They utilized a survey to gather information on faculty knowledge of, experience with, and influencing factors toward the use of instructional technology. Three hundred and sixty seven faculty
responded to a mailing of 760 surveys at a research one university in the Mid-West region, yielding a response rate of 48%. Results indicated no significant gender differences regarding knowledge and experience for most instructional technologies surveyed. A significant difference was noted regarding higher knowledge of and experience with multimedia and statistical computing software by male faculty when compared to female faculty. Additionally, males reported a higher frequency of use for computer-assisted instruction compared to their female colleagues.

Spotts and others suggested that males have a higher comfort level with utilizing instructional technology. In regard to factors influencing use, males responded differently than females. Male faculty reported ease of use, time needed to learn a new technology, and training to use a technology as less important than females. Female faculty rated incentives to use instructional technology more important than their male colleagues, further supporting the idea that females tend to have a lower comfort level when it comes to utilizing technology.

Lucas (2002) reported data specific to web-based technologies used for instructional purposes. She noted little difference in frequency of use and knowledge and experience of web-based technologies between male and female faculty, but suggested differences in how males and females utilize technology existed. Lucas suggested males used technology to gather information while females used technology to communicate.
However, different results were noted in her research regarding faculty gender differences in teaching utilizing WebCT modules.

Lucas (2002) analyzed 174 WebCT courses at the University of Alabama in order to determine whether differences existed between male and female faculty regarding which of six modules (calendar, quiz, content, chat, discussions, and syllabus) were utilized. She noted no significant differences for chat, calendar, and syllabus modules. However, female faculty utilized the content and quiz modules significantly more than male colleagues. This contradicts her statement regarding males primarily using technology to gather information. This also contradicts the finding of females using technology to communicate more than males. The communication tools were utilized similarly with no significant gender differences.

Schifter (2002) conducted a survey of faculty and administrators at a research intensive university regarding the use of technology in teaching, factors related to participation in distance education, and understanding of distance education policies. Two hundred and sixty-three of 1312 faculty responded to the survey. Results indicated no significant differences in regard to participation in distance education based on gender. Significant differences were noted in regard to motivating and inhibiting factors between males and females; females
ranked these factors as having a greater importance than male colleagues.

Lebediker (1997) utilized a survey to gather data regarding computer usage and attitudes at 59 universities nationwide. He looked into differences based on demographic information including gender and age. In regard to gender alone, Lebediker noted slight variations in computer use. However, those differences were not significant when specifically identifying technology use in the classroom.

*Age differences.* Conflicting reports regarding faculty attitudes toward and extent of utilization of instructional technology, and computer usage in general, exist when identifying age differences (Anderson et al., 1998; Lebediker, 1997; Schifter, 2000).

Results from Lebediker's (1997) study regarding computer usage and attitudes indicated varying results regarding age differences among faculty. He reported that faculty had a tendency to indicate only a slight decrease in computer use with an increase in age. However, a significant decrease in utilization of technology within the classroom setting was noted among faculty as their age increased.

Schifter (2002) noted no significant differences in regard to faculty participation in distance education based on age. Additionally, Schifter reported significant age differences in factors that motivated faculty to utilize distance education. Results indicated younger faculty (under the
age of 30) were more concerned than older faculty with motivating factors related to personal needs, such as credit and lack of credit towards promotion and tenure, job security, and reduced teaching load.

Warburton, Chen, and Bradburn (2002) performed a nationwide survey to explore faculty use of telecommunications technology. In regard to differences among faculty based on age, they reported a negative correlation with age and some instructional technologies. As age of faculty increased, use of e-mail for instructional purposes and use of class-based websites decreased.

Anderson (et al., 1998) utilized a survey to gather information on the adoption of teaching and learning technologies by faculty at the University of Alberta. A survey was sent to all full time faculty members (1487) with a response rate of 37%. Overall, Anderson and others noted faculty utilized information tools to a greater extent than other technologies. They reported early adopters of teaching technologies utilized these technologies to a greater extent than other faculty members. These early adopters were noted as being younger than the mainstream faculty who tended to utilize instructional technology less. Additionally, early adopters (these being the younger faculty) reported having a more positive attitude towards instructional technology. In particular, they indicated that technologies had improved the quality of their teaching and had benefited their contact with students.
Roger Baldwin (1998) wrote, "There seems to be a widespread consensus in higher education that technology has the potential to revolutionize the teaching-learning process. The evidence on how far this revolution has advanced is less clear, however" (p. 9). Several researchers have explored the utilization of instructional technology within particular institutions and/or areas of study, many with varying results. Review of such studies follows in the proceeding sections.

The campus computing project. The Campus Computing Project is an annual survey of technology use on college and university campuses (Green, 2001). The 2002 survey marked the 13th year of data collection. Campus officials at two- and four-year public and private colleges and universities across the United States provide data for the project each year.

Green (2001) noted the importance of instructional technology among campuses when the most important issue reported from the 1997-2001 surveys was to provide assistance to faculty for integrating technology into their instruction. From the 2000 survey data, Green indicated increases in the utilization of technology resources in the classroom and in the role of technology in supporting teaching and learning. In the year 2000 approximately 60% of college courses utilized e-mail, 42% used Web resources as a component of the course syllabus,
30% of courses had a Web page, and 23% of faculty had a personal Web page (Green, 2000). Course management tools were reported as low utilization, with 14% of campuses indicating use in 2000. However, the use of course management tools rose to nearly 21% of all college courses in 2001 (Green, 2001).

In the 2000 survey report Green suggested the possibility of reaching a plateau regarding instructional technology use. Green may have observed a leveling off of utilization in more recent studies, because there is a lack of information in the 2001 and 2002 reports regarding specific instructional technologies utilized by faculty. The most recent reports focused on the use of campus portals, budget concerns, electronic commerce, and instructional technology staffing concerns.

Faculty attitudes toward and implementation of instructional technology in community colleges. A survey instrument was used to gather information from faculty employed at community colleges within specific geographical areas in the United States (Revell, 1999). The survey was designed to collect data on faculty attitudes and implementation of instructional technologies. The study reported community college faculty had a positive attitude toward the use of instructional technologies. Faculty felt technology enhanced learning, student use of technology was important, faculty use of technology for teaching and learning was important, and the use of technology
facilitated learning. Data indicated the use of technology in all phases of teaching activities, including pre-class preparation, during-class presentation, and out-of-class activities. The use of spreadsheets, word processing, e-mail, web pages, and discipline specific software were reported as used more commonly. Less frequent use of videoconferencing, teleconferencing, computer-based collaborative learning, computer testing, and computer simulations was indicated.

Instructional technology use at the University of North Texas.

During the 1994-1995 academic year the Instruction Program Group at the University of North Texas conducted focus groups and other activities to assess faculty perceptions, current practices, and views of future challenges regarding instructional technologies (Byron, 1995). In general, results from the study indicated faculty were very interested in using technology for teaching. Attitudes toward instructional technology included a belief that technology can add value to the educational experience and that it could be beneficial to student learning. Faculty viewed instructional technology as an "added layer" to teaching, and not a "silver bullet" that can magically solve all instructional problems (Byron, 1995, p. 2). Furthermore, faculty expressed frustration with not being able to realize the full potential of technology in teaching due to a lack of support, fear of unreliability, lack of time, and a lack of clear models to follow.
Faculty use of instructional technology at Western Michigan University. Research at Western Michigan University was conducted in order to determine faculty knowledge of, use, and attitudes toward instructional technology (Spotts & Bowman, 1995). The survey was sent to 696 faculty members with 306 completed yielding a response rate of 44%. The majority of faculty members rated their knowledge and experience highest for technologies such as audio, film, video, and word processing. Fewer faculty rated high levels of knowledge and experience with more computer-based technologies including spreadsheets, statistical computing, e-mail, and computer assisted instruction (CAI). The least amount of knowledge and experience was reported for presentation software, computer conferencing, multimedia, and distance learning. Regarding technologies used in teaching, faculty reported word processing as the most commonly used technology and distance learning, computer conferencing, and multimedia as the least frequently used technologies. Despite low knowledge levels, experience with, and frequency of use, most faculty members reported instructional technologies as important to teaching.

Instructional technology use at the State University of West Georgia. Researchers in the Department of Learning Resources at the State University of West Georgia (UWG) surveyed 348 full-time faculty regarding influences to technology adoption (Beggs, 2000). One hundred
and fifty-six individuals completed the survey for a response rate of 44%.
The survey instrument was designed to gather data regarding faculty’s self-reporting knowledge and use of technology, factors influencing their use of technology, perceived barriers to the use of technology in the classroom, and the importance of instructional technology in their instruction (Beggs, 2000, p. 4).

Beggs (2000) reported three categories of influencing factors including 1) instructional and learning issues, 2) equipment access and training, and 3) instructional materials, discipline-specific factors, and other issues (p. 4). Instructional issues as a whole ranked highest among factors that influence the adoption of instructional technology, with improving student learning, advantages over traditional teaching methods, and increased student interest rating the highest. Equipment access and training was rated highly, with availability of equipment being ranked second overall. When looking at barriers towards adoption of instructional technology, Beggs stated lack of time, lack of easily accessible equipment, and lack of training as the highest rated factors. Overall, more than 50% of the respondents to the UWG survey reported technology as an essential component to instruction.

*The impact of instructional technology at Middle Tennessee State University.* A survey conducted by researchers at Middle Tennessee State University (MTSU) published in 2001 evaluated the impact of technology
on teaching and learning (Lea, Clayton, Draude, & Barlow, 2001). The study included a four-part questionnaire aimed to gather information on students’ and faculty’s opinions of instructional technology, frequency of use, projected use, and demographics at MTSU. Responses to the questionnaire represented 35% of campus faculty. Data gathered from faculty surveyed suggested the following findings:

1. Faculty believe that instructional technology is essential;
2. Faculty have various needs relating to instructional technology;
3. Instructional technology is widely used across campus;
4. Different instructional technologies accommodate different teaching practices;
5. Faculty use of instructional technology will continue to increase (Lea et al., 2001, p. 69).

A follow-up survey conducted by the same researchers (representing 23% of the faculty) further suggested faculty believed Web-based training enhanced student learning and that technology-based classrooms are important (Lea et al., 2001). However, faculty indicated more time and training is needed to develop courses incorporating instructional technologies. Also a greater need for the utilization of technology to positively impact the promotion and tenure process utilized at MTSU was noted.
The use of notebook computers at the University of Minnesota, Crookston. In an attempt to provide enhanced technology, faculty and students at the University of Minnesota, Crookston (UMC) were provided with notebook computers, beginning in the fall of 1993 (Sargeant, 1997). In December of 1995, 1312 faculty members were asked to provide assessments on their personal experiences with implementation of the notebook computers. Two hundred and sixty three usable surveys were completed yielding a response rate of 20%. Ninety five percent of faculty indicated major benefits from the implementation of the technology. These benefits included expanded learning opportunities and flexibility for students as well as increased communication abilities between faculty and students, students and students, and faculty and faculty. Large changes resulting from the notebook utilization involved faculty computer skill enhancement and strengthened image of UMC faculty. In regard to most utilized computer applications, almost all faculty members reported daily use of word processing and e-mail communications. Additionally, 90% indicated regular use of presentation software, spreadsheets, and topical field related software; however, when it came to more specialized tools, faculty usage declined. As for the impact of the technology use, 90% of faculty reported an increase in student opportunities for learning, and 60% suggested UMC has become a more exciting and rewarding place to work (Sargeant).
The use of instructional technology within the College of Human Ecology at the University of Tennessee. Utilizing a survey instrument to determine use of, interest in, and attitudes toward technology in teaching and learning, a study was done within the College of Human Ecology at the University of Tennessee (Groves & Zemel, 2000). Subjects included full-time faculty and graduate teaching assistants. Researchers reported a 49% response rate. In regard to knowledge level faculty and graduate teaching assistants rated their knowledge highest for technologies supported by computers, including word processing, e-mail, computer spreadsheets, and Internet use. In contrast, faculty and graduate teaching assistants rated their knowledge lowest in technologies requiring peripheral equipment or specialized software. Similarly, word processing, Internet, and presentation software were technologies reported as having a higher usage level. In addition, multimedia, computer-assisted instruction, and distance learning were found to have lower frequencies of use among faculty.

The findings from Groves and Zemel suggest an increased comfort level with “tool technologies” (e.g. word processing and spreadsheets) and tentativeness toward “new technologies” (e.g. multimedia, distance learning, and computer-aided instruction) (p. 59). The authors further suggested an increase in familiarization with and knowledge of newer technologies may yield an increase in utilization of these instructional
technologies. This led the authors to create and maintain a web-based resource on technology use in teaching for faculty and graduate teaching assistants to access.

The use of technology by teacher education faculty. Brown (2001) reported on the use of technology by teacher education faculty for problem solving and higher order thinking. A survey was used to gather information from a sample of teacher educators in the state of Arkansas. Two hundred and sixty-nine surveys were mailed and 125 were returned, for a response rate of 56%. The survey was designed to obtain data on personal use of computers and related devices and on the use of technology for problem-solving experiences. Brown reported faculty were integrating computers into instruction in the following three areas: use of e-mail and the Internet, use of the World Wide Web for solving open-ended problems, and use of word processing to generate booklets, reports, and newsletters (p. 13). Data suggested technology resources were being utilized for students to collect information and to solve open-ended problems; however, little evidence supported students using that information for drawing conclusions and solving problems. The study further indicated low levels of faculty integration of multimedia materials and more advanced instructional technology methods.

The use of instructional technology in poultry science education. Hogle, Pesti, and King (2000) reported on the use of instructional
technology by faculty teaching in poultry science curriculum in the United States, Canada, and Puerto Rico. A survey instrument was utilized to gather data regarding instructional technology use and experience with general technology items (ranging from basic to complex) and computer software items (ranging from common programs to advanced programs) by faculty. Of the 21 general technology items, Hogle (et al., 2000) found seven to be the most commonly used: white or chalk boards, video cassette recorders, slide and overhead projectors, computers, e-mail, and Internet browsers. Faculty use of these technologies was not separated by area of use; therefore, reported use could be for teaching, research, or personal use. When looking specifically at teaching, Hogle (et al., 2000) found traditional technologies, white or chalk boards, overhead projectors, and slide projectors to be the most common technologies used. Computer usage and the use of Internet technology to assist in development or delivery of instruction were noted, with word processing, presentation, spreadsheet, and statistical programs being the most common technologies used.

Findings from the Hogle (et al., 2000) study indicated an increase in instructional technology usage among poultry science education faculty from a similar study published in 1984 by Pesti and Noles. The researchers believed the increase in usage was in part due to the
improved ease of use of computers and software programs combined with the enhanced commonness of computers within our culture.

_Athletic Training Education Programs_

Athletic training education has undergone significant reform in recent years. In order to compete with other allied health professions, to create a higher standard for the profession, and to produce the most effective certified athletic trainers, a standardized education and route to certification has been developed (Delforge & Behnke, 1999). As of the year 2004, students must attend and graduate with a minimum of a baccalaureate degree from an Accreditation of Allied Health Education Program (CAAHEP)-accredited, entry-level athletic training program in order to be eligible for the National Athletic Trainers' Association Board of Certification (NATABOC) exam (Delforge & Behnke). As of January 2004, 243 CAAHEP accredited undergraduate athletic training programs existed in the United States (JRC-AT, 2004).

All CAAHEP-accredited, entry-level athletic training education programs are curriculum and content based as opposed to specified course based. Programs are not required to offer particular courses, however, they must provide instruction in specific areas. The content of educational programs is defined by two documents: the _NATABOC's Role Delineation Study of the Entry-Level Athletic Trainer (RDS)_ and the _NATA's Athletic Training Educational Competencies (Competencies)_ (Starkey,
Koehneke, & Ryan, 2002). The RDS essentially describes the current practice of athletic training and defines content for the national certification exam: "The Competencies describe educational content and include the information identified in the RDS and also anticipate the future needs of the profession" (Starkey et al., 2002, p. 18). The Competencies consist of cognitive, psychomotor, and affective domains as well as clinical proficiencies that describe students' measurable clinical skills; cumulatively, they provide standards for curriculum design, development of individual courses, and structuring of clinical experiences (NATA Education Council, 2003).

Athletic training curriculum content should include appropriate instructional emphasis on subject matter specified by the current RDS and Competencies. Formal instruction in the following expanded subject matter areas is essential: 1) assessment of injury/illness, 2) exercise physiology, 3) first aid and emergency care, 4) general medical conditions and disabilities, 5) health care administration, 6) human anatomy, 7) human physiology, 8) kinesiology/biomechanics, 9) medical ethics and legal issues, 10) nutrition, 11) pathology of injury/illness, 12) pharmacology, 13) professional development and responsibilities, 14) psychosocial intervention and referral, 15) risk management and injury/illness prevention, 16) strength training and reconditioning, 17) statistics and research design, 18) therapeutic exercise and rehabilitative
techniques, 19) therapeutic modalities, and 20) weight management and
body composition (NATA Education Council, 2003). Additionally, the
athletic training curriculum must include provisions for student clinical
experiences under the direct supervision of a qualified clinical instructor
in an appropriate clinical setting. Clinical experiences should be devised
in order for students to develop proficiency in specific competencies
(NATA Education Council).

*Instructional technology in athletic training education.* Most current
literature and published studies to date have focused on the use of CAI
and multimedia computer programs (Boscolo et al., 2002; Buxton et al.,
1995; Chen et al., 1995; Deere et al., 1995; Lebsack Wiksten et al., 1998;
Wiksten et al., 1999; Wiksten et al., 2002). These studies have focused
on comparing the use of CAI or multimedia to traditional methods of
instruction, and overall they have indicated varying results. No
information from this group of studies was reported regarding faculty
attitudes toward or the extent of utilization of instructional technology.

Literature supporting the use of instructional technology within
athletic training education programs is available. Gould (et al., 1995)
provided a report to encourage athletic training educators to utilize
multimedia in their instruction. Gould and others indicated the use of
instructional technologies would help meet the educational needs of
today's athletic training students. Tsuchiya (1995) provided a review
discussing the amount of information available through technology, and the significant impact that utilizing technology in instruction might have on student athletic trainers as well as practicing certified athletic trainers. Furthermore, Speitel and Buxton (1995) emphasized the use of CAI to aid in the instruction of student athletic trainers, and discussed the need for development of interactive computer software specific to athletic training curriculums.

Fincher and Wright (1996) reported research specifically toward understanding the utilization of and attitudes toward computer based instruction (CBI). For the purpose of this study CBI included the use of CAI as well as interactive video. The research involved all (97) program directors of NATA-approved undergraduate and graduate athletic training programs (prior to CAAHEP accreditation requirements) at the time of the study. Eighty-nine surveys were returned for a response rate of 91.8%. Fincher and Wright reported 55.8% of program directors used some form of CBI in their instruction, mainly as a supplement to traditional teaching methods. Additionally, there was an overall positive attitude expressed toward the use of CBI in athletic training educational environments. However, program directors indicated a need for increased development of software programs specific to athletic training and sports medicine education.
Six years later, the National Athletic Trainers’ Association Educational Multimedia Committee (NATA-EMC) reported conducting a web-based survey regarding the use of educational technology in athletic training education (Castle & Stemmans, 2002). The purpose of the survey was to gather baseline data regarding the use of technology tools in the classroom, the use of technology tools in administering the educational proficiencies, personal comfort with technology, and personal awareness of on-campus technology services. A total of 121 educators from 92 CAAHEP accredited, CAAHEP candidacy, and NATA approved graduate programs responded to the survey, however, a response rate cannot be determined because the actual number of surveys distributed is unknown. (Hunt, 2003).

From the NATA-EMC research, faculty reported electronic presentations, e-mail, and video or digital clips (89%, 84%, and 67% respectively) as the most common instructional technologies utilized (Hunt, 2003). Over 30% of faculty reported using audio files, automated course websites, and internet-based course syllabi. Less frequently utilized technologies included course web sites and video or digital capture. Eighty percent of faculty noted an increase in the use of technology in the classroom during the past three years, and 93% expect it to play an even greater role in the upcoming three years. In regard to technology’s effectiveness in educating athletic training students, 31%
reported it as very effective while 56% reported it as somewhat effective. Faculty reported dislikes with instructional technology included the time it takes to get technology pieces set up and operational, problems with hardware accessibility, and inevitable technological difficulties. Overall several faculty felt that exposure to technology in education will help prepare students more efficiently for the workforce.

Summary and Conclusions

It is clear a belief exists regarding the importance of incorporating technology with higher education (Doucette, 1994; Kozma and Johnston, 1991; Passerini & Granger, 2000). Students, parents, legislatures, the public, and employers have come to expect and have demanded more from institutions of higher education, in regard to increased access, improved quality, and lower costs (Oblinger & Rush, 1997). They insist on access to technology and the incorporation of technology into the curriculum in order to appropriately prepare students for the workforce and to meet the needs of the "Information Age Learner" (Oblinger & Rush, 1997, p. 13). Doucette commented that there has been and will continue to be an unavoidable impact of technology on education. Kozma and Johnston (1991) further stated,

To keep a competitive advantage in a world economy, it is widely accepted that tomorrow’s workers must have the skills to use computers and be able to exploit their power in
new situations, so the public will support institutions in their efforts to incorporate computing into the curriculum (p.22).

Current literature provides solid information regarding forms and uses of instructional technologies available to educators (Doucette, 1994; Gross Davis, 1993; Hogle, 1999; Kizzier, 1995). Research emphasizing support for the use of instructional technologies is abundant (Doucette; Garland, 1995; Green & Gilbert, 1995; Kizzier; Kozma & Johnston, 1991; O’Banion, 1997a; O’Banion, 1997b; Passerini & Granger, 2000). Additionally, information regarding opposition towards and barriers to adoption of instructional technologies exists (Garland, 1995; Green & Gilbert; O’Banion, 1997b). Some research even exists regarding faculty attitudes toward instructional technology, but typically this research involves individual colleges and/or universities (Adam & Wilson, 1996; Beggs, 2000; Byron, 1995; Green, 1996; Hogle, 1999; Groves & Zemel, 2000; Lea et al., 2001; Sargeant, 1997; Spotts & Bowman, 1995).

Minimal research has been conducted in recent years regarding diffusion of instructional technology techniques across campuses within the United States. Few data exist regarding which instructional technologies faculty members at institutions of higher education are utilizing. Literature regarding differences among faculty based on gender and age are conflicting and limited in regards to extent of utilization of
and attitudes toward instructional technology. Moreover, to this point, no research regarding attitudes toward or extent of utilization of instructional technology has been published specific to the area of athletic training education.

The current study reviewed instructional technology within CAAHEP-accredited, entry-level athletic training education programs at institutions of higher education in the United States. Faculty attitudes toward instructional technology were explored through a self-reporting survey. Additionally, the survey included items designed to gather information regarding to what extent particular forms of instructional technology were being utilized. Furthermore, an exploration of whether differences existed among faculty utilization and attitudes based on gender and age was conducted.
Chapter Three: Methodology

The purpose of this study was to investigate athletic training educators’ attitudes toward instructional technology and the extent of their utilization of that technology. A quantitative research method was utilized. The researcher developed and distributed a survey instrument, collected data, analyzed data, and presented data obtained from the survey. This chapter provides details for the research design, data collection procedures, and the data analysis procedures.

Recommended protocols for research with human subjects were followed throughout this research study. Participants were fully informed of the purpose of the study and participation was voluntary. Participants were asked to include their e-mail address with the questionnaire to facilitate follow-up and to provide results to participants who requested them. E-mail addresses were separated from the questionnaires as they were submitted and data were collected. This was done to protect the identities of research participants. The Ohio University Office of Research Compliance determined this research study as exempt from Institutional Review Board (IRB) review (see appendix A) due to the low risk to research participants when survey procedures are involved. Consent to participate was considered inherent upon completion of the survey. Consent was achieved through the electronic mail (e-mail) correspondence (see appendix B) sent to participants.
Research Design

Operational Definition of the Variables

Independent variables. The individuals surveyed in this research project included college/university athletic training educators within Commission on Accreditation of Allied Health Education Programs (CAAHEP) accredited, entry-level athletic training education programs in the United States. Participants were athletic trainers certified by the National Athletic Trainers’ Association Board of Certification (NATA-BOC). Gender was the first independent variable studied. Gender was defined as either male or female. Age was the second independent variable studied. For data analysis age was transformed into nominal data. Four categories were created based on age data gathered, utilizing the “visual bander” option in the Statistical Package for the Social Sciences (SPSS), for Windows, Version 12.0.

Dependent variables. There were two dependent variables measured in this study: attitude and extent of utilization. A survey instrument developed by the researcher was utilized to measure both dependent variables. Attitude items were measured with a five point Likert scale. Extent of utilization items were measured with a four point Likert scale.

Attitude items scored consisted of items One through 23 in “Section 2: Attitude Towards Instructional Technology” on the survey
instrument entitled “Attitudes Toward and Extent of Utilization of Instructional Technology in Athletic Training Education Programs Survey.” For each item in this section, a score of one through five was given. Items One, Two, Four, Seven, Eight, 10, 11, 14, 15, 16, 17, 19, 20, and 21 were scored in a positive manner, “strongly agree” equals five points, “agree” equals four points, “neutral” equals three points, “disagree” equals two points, and “strongly disagree” equals one point. Items Three, Five, Six, Nine, 12, 13, 18, 22, and 23 were written in a negative manner and hence were reverse scored, that is “strongly agree” equals one point, “agree” equals two points, “neutral” equals three points, “disagree” equals four points, and “strongly disagree” equals five points. By reverse scoring the negatively phrased items, the scale will provide a total score that reflects attitude towards instructional technology (Tuckman, 1999). A respondent with a positive attitude towards instructional technology would have a tendency to agree with positive items and disagree with negative items, whereas a person with a negative attitude towards instructional technology would respond in the opposite manner. The inclusion of both positively and negatively phrased items was utilized to help discourage respondents from automatically providing the same answer for each item (Tuckman). Item 24 in Section Two was not scored. It was utilized to gather written comment and qualitative data from the respondents.
Extent of Utilization items consisted of items One through 39 in “Section 3: Instructional Technology Use” on the survey questionnaire “Attitudes Toward and Extent of Utilization of Instructional Technology in Athletic Training Education Programs Survey.” All items in Section Four were scored in a positive manner with “never use” equal to one point, “experimented with” equal to two points, “use occasionally” equal to three points, and “use regularly” equal to four points.

**Identification of the Population**

The target population was certified athletic trainers who were educators in CAAHEP-accredited, entry-level athletic training education programs at institutions of higher education in the United States as of January 2004. The target population consists of 983 educators, including graduate assistants, part-time, and full-time faculty members who had an active e-mail account. Educators must have been teaching or have taught at least one athletic training course during the 2003-2004 academic year. This study excluded educators who were not certified athletic trainers. Additionally, educators working at institutions of higher education with athletic training education programs in "candidacy" status or at any other stage in applying for accreditation were excluded from this study.
Sampling Plan

Research via three methods was undertaken to determine a list of current educators within accredited, entry-level athletic training education programs. The researcher utilized the Internet to access a comprehensive list of all CAAHEP-accredited, entry-level athletic training programs from the CAAHEP website (CAAHEP, 2004). As of January 2004, 243 accredited programs existed in the United States. The researcher visited all available websites for the athletic training programs listed. From these websites, the researcher devised a list of instructors within each athletic training program. A three-fold process was used to help ensure the list was current and accurate. The researcher specifically visited each institution’s athletic training website to find the current educators. The instructors’ names were then cross-referenced with the instructor scheduled for the athletic training course listed under the schedule of classes for each academic term available for the 2003-2004 academic year. The list was then cross-referenced once again with the institution’s current faculty/staff directory.

Type I error is defined as “the probability of rejecting the null hypothesis when it is true” (Stevens, 1996, p. 172). Common levels for alpha in social science research are \( \alpha = .10 \) and \( \alpha = .05 \). For this study alpha was set a priori at \( \alpha = .05 \) level in order to determine if differences were significant. Type II error (\( \beta \)) is the probability of accepting the null
hypothesis when it is false (Stevens). Power is defined as “the probability of making a correct decision” in accepting or rejecting the null hypothesis (Stevens, p. 173). A common level for power in social science research is .80, hence power was set a priori for this study at .80. Previous research has revealed no concrete evidence for the effect size that gender and age have on attitudes towards instructional technology or the extent of utilization of instructional technology. Consequently, the researcher continued in an exploratory manner and utilized Cohen’s medium (.25) effect size (Cohen, 1988).

The sample size needed in a study is directly related to alpha level, power, and effect size. Cohen’s (1988) text was consulted to determine appropriate sample size. For a two-way ANOVA study with the values for alpha = .05, effect size = .25 and power of .80, Cohen’s tables suggest that approximately 44 subjects per cell are needed with two independent variables (one with two levels and the other with four levels). Therefore, a sample size of 352 participants was required. As examined in the review of literature, reported response rates from previous research regarding instructional technology vary from 20% to 92%, with an average rate of 40%. Based on the previous research a conservative response rate of 40% was anticipated. Using this value as a guide, the survey should have been sent to at least 880 potential participants. A list of 983 athletic training educators who are certified athletic trainers was devised,
however, four of them had no available e-mail address. This study included all 979 educators with usable e-mail addresses in an attempt to collect as much information as possible.

Instrumentation

Development of instrument. The researcher devised a survey including demographic items, items to measure attitudes toward instructional technology, and items to measure extent of utilization of instructional technology, based on literature review. Demographic items included: gender, age, highest level of education obtained, and positional rank. "Attitude" items were written based on areas previously studied and from literature content detailing the positive and negative aspects of utilizing technology in education. For the "current use" portion of the survey, a list of instructional technology techniques was devised based on which technologies are known to exist within the higher education setting found within recent related literature and upon consultation with an instructional technology expert. The survey instrument was reviewed by a panel of four experts in the field of higher education prior to conducting the study. All panel members have obtained a terminal degree and specialize in higher education, educational research, or athletic training.

Subjects were instructed to answer items regarding instructional technology use specifically for teaching athletic training courses. Items
regarding "attitude" were to gain information regarding subjects' general attitudes about instructional technology use within athletic training education. Items regarding "current use" were designed to gather data regarding the extent to which instructional technologies are utilized. Subjects were instructed to consider instructional technologies used for all phases of instructional activities, including pre-class preparation, during-class instruction and activities, and out-of-class instructional activities.

After the survey instrument was developed it was transformed to a Web eForm and posted on the Internet using Cardiff TELEform software. The online survey was posted through St. John Fisher College and was located at http://home.sjfc.edu/assessment/attitudes/survey.htm. As participants completed and submitted the survey, data were captured and processed through the TELEform software. Once data were processed they were exported directly into the SPSS program where data were analyzed.

*Pilot study.* A pilot study is a useful tool for checking survey items and helping to ensure the instrument is clearly understood (Light, Singer & Willett, 1990). In order to examine the instrument for quality, reliability, and appropriateness of content a pilot study was completed using a convenience sample \((n = 16)\) of instructors teaching health-related courses at colleges and universities in upstate New York. Each
participant received a paper version of a cover letter and survey (see appendices C and D) intended to be identical to the on-line survey to be used in the study. One additional piece was added to the pilot survey. This addition asked open-ended questions regarding the clarity, additions or deletions, topics that were not addressed, and the approximate time it took to complete the survey. The qualitative questions were added to obtain participant feedback and correct any errors in wording or procedures before administering official surveys.

Reliability. Pilot data were utilized to check for reliability and item analysis of the instrument. For “Section 2: Attitude Towards Instructional Technology” and “Section 3: Instructional Technology Use”, performance on each item within that section was compared to a total score for the section using a procedure termed item analysis. Item analysis helps provide an indication of the degree of agreement between each individual item and the total scale (Tuckman, 1999). Essentially, information was provided regarding which items were “good.” This in turn contributes to the reliability of the instrument. A reliability coefficient of .50 or above for attitude tests is considered acceptable (Tuckman).

One original item in “Section 2: Attitude Towards Instructional Technology” was found to contribute negatively to the reliability of the instrument therefore the researcher decided to remove that item. With
the item removed from the survey the coefficient alpha reliability estimate on this scale as computed from pilot data were .93. A second item was found to function poorly, so the researcher re-wrote the item in an attempt to enhance clarity. The item was changed from “Incorporating instructional technology is time consuming” to “Incorporating instructional technology is too time consuming.”

The coefficient alpha reliability estimate for “Section 3: Instructional Technology Use” was computed from pilot data as .93. A few items on this scale scored poorly, however, it was decided to retain these items due to their importance in the study. These items were carefully monitored during the actual study to determine whether a larger sample size resulted in the items functioning better.

Validity. Content validity of the instrument was enhanced due to instrument items being based on current literature on instructional technology and review of instrument items by professionals in the fields of higher education and educational research. Additionally, open-ended questions were added to pilot surveys in an attempt to obtain feedback from participants regarding content of the survey.

As a result of participant feedback from the pilot study some corrections were made to the survey instrument. A statement of how instructional technology is referred to in this study was added to the top of the survey. Participants suggested this would help with completing
the survey more appropriately. Additional changes were made to Section Three. Item Six, “video desktop projection system”, and Item Seven, “video lightstand projection unit”, were combined to form one item, “video projection system.” Furthermore, two items, “computer testing” and “computer simulations”, were added to this section.

Data Collection Procedures

An e-mail correspondence containing information regarding the survey and a link to the on-line survey were sent to each potential participant (see appendices B and E). The initial e-mail correspondence contained general information regarding the study, the purpose of the study, a confidentiality statement, a statement regarding voluntary participation, and instructions for completing the survey. Respondents were asked to include their e-mail address on the survey as a coding system to allow the researcher to send follow-up e-mails as necessary to non-respondents, asking them to complete and return the instrument if they have not already done so. E-mail addresses were held in a master list that only the principal researcher had access to. As survey responses were retrieved and linked to SPSS software, e-mail addresses were separated and deleted. Two weeks after the initial e-mails were sent, a follow-up e-mail was sent to non-respondents. A third and final e-mail was sent two weeks after the second mailing to non-respondents. Items replicated the original e-mail with the exception of the letter being
modified to emphasize the purpose and importance of the study and asking subjects to please complete and submit the on-line survey if they had not already done so (see appendices F and G). Respondents were offered survey results when the study was completed.

Data Analysis Procedures

Data analysis was provided through the use of SPSS. Once data collection was completed descriptive statistics for all independent and dependent variables were computed. Additionally, qualitative data gathered from Item 24 in Section Two were analyzed.

The following null hypotheses were proposed in order to determine whether differences among athletic training educators existed in regard to their attitudes towards instructional technology and their extent of utilization of that technology:

HO\textsubscript{1}: There are no significant differences between male and female athletic training educators' attitudes towards instructional technology.

HO\textsubscript{2}: There are no significant differences in athletic training educators' attitudes towards instructional technology based on age.

HO\textsubscript{3}: There is no interaction effect between age and gender and attitudes towards instructional technology.
HO4: There are no significant differences between male and female athletic training educators' extent of utilization of instructional technology in their teaching.

HO5: There are no significant differences in athletic training educators' extent of utilization of instructional technology in their teaching based on age.

HO6: There is no interaction effect between age and gender and extent of utilization of instructional technology.

In order to test these hypotheses, a two-way analysis of variance (ANOVA) was conducted. To test Research Hypotheses One, Two and Three the independent variables were gender (male and female) and age (< 33, 34-45, 46-56, 57+) and the dependent variable was the summated score representing attitude towards instructional technology. Attitude items scored consisted of Items One through 23 in “Section 2: Attitude Towards Instructional Technology” on the survey instrument. To test Research Hypotheses Four, Five and Six the independent variables were gender (male and female) and age (< 33, 34-45, 46-56, 57+) and the dependent variable was the summated score representing extent of utilization of instructional technology. Extent of utilization items consisted of Items One through 39 in “Section 3: Instructional Technology Use” on the survey instrument. An alpha level of .05 was set
a priori to determine if data were statistically significant for each test. Significant interaction effects were further explored.

Two advantages of utilizing a two-way ANOVA made it applicable in this study. A two-way ANOVA allowed the researcher to look at the effects of two independent variables and their interaction on mean scores on the dependent variable (Tuckman, 1999). Therefore, the researcher could examine main effects for each independent variable along with a joint effect of the two independent variables on the dependent variable. This information is unavailable from running two one-way ANOVAs (Stevens, 1996). A significant “interaction means that the effect one independent variable has on a dependent variable is not the same for all levels of the other independent variable” (Stevens, p. 292). A second advantage to utilizing a two-way ANOVA is that it could lead to more powerful tests by reducing error variance.

Four assumptions for a two-way ANOVA were examined. The first assumption is that observations are independent. This assumption requires that participants complete the survey on their own. There should be no interaction of subjects that may influence their observations. A second assumption underlying use is that the variables are measured on an interval or ratio scale. The measures used on a survey instrument may be considered ordinal or interval in nature. However, a two-way ANOVA is often used with measures that fall
between the ordinal and interval level of measurement. The third assumption is that observations are normally distributed on the dependent variables. The two-way ANOVA is robust to this assumption if each of the distributions is symmetric or if skewness is in the same direction for each cell. This assumption was primarily examined graphically for each group using the “Explore” feature of SPSS. Additionally, non-graphical tests were examined. The fourth assumption is homogeneity of variance. Stevens (1998) suggests ANOVA is robust to violations of this assumption. The idea is to try to attain equal group sizes. Stevens stated, “as long as the group sizes are approximately equal (largest/smallest 1.5), F is robust” (p. 249). The Levene test was applied to check the assumption of homogeneity of variance.

Summary

This chapter explained the methods and procedures to be used in this study. The design and variables for the study were presented first. The population was then identified, followed by the development of the survey instrument. Lastly, this chapter detailed data collection procedures and data analysis procedures including advantages and assumptions for performing a two-way ANOVA study.
Chapter Four: Presentation and Analysis of Data

The purpose of this study was to investigate athletic training educators’ attitudes toward and the extent of utilization of instructional technology. Specifically, the researcher wanted to determine whether differences exist in athletic training educators’ attitudes toward instructional technology based on gender and age. Additionally, the researcher wanted to establish whether differences in extent of utilization of instructional technology exist based on educators’ gender and age.

This chapter contains the presentation and analysis of data collected for this study. To begin with, a description of research participants is provided. Next, the analysis of assumptions for using ANOVA is presented. Reliability analysis of the instrument used in the current study is provided. Results and statistical analyses utilized to test the research hypotheses are reported. The chapter concludes with a presentation of additional findings, qualitative data, and an overall summary.

Data Collection Procedures

Participants in this study were certified athletic trainers teaching in Commission on Accreditation of Allied Health Education Programs (CAAHEP) accredited, entry-level athletic training education programs in the United States. Each potential participant was sent an electronic mailing of a cover letter and a link to the on-line survey. Participants
were asked to connect to the electronic survey, complete the instrument, and submit responses. As subjects completed and submitted survey responses, data were electronically captured with Cardiff TELEform software. Once data were captured, they were exported to the Statistical Package for Social Sciences (SPSS) for Windows, Version 12.0 where analyses were run. Each potential participant was given two weeks to complete and submit the survey. At the beginning of the third week, a second e-mail was sent as a follow-up to non-respondents. A final e-mail was sent to non-respondents at the beginning of the fifth week.

Description of Participants

Descriptive statistics were implemented to gather data on the participants used in the study. Participants included certified athletic trainers teaching in CAAHEP-accredited, entry-level athletic training education programs within the United States. Initially, 979 e-mails were distributed, including a link to the on-line survey, resulting in 269 responses. This yielded a response rate of 27.47%.

One individual responded to the initial e-mail stating their institution had recently lost CAAHEP accreditation due to costs associated with maintaining accreditation status. As a result, the remaining five educators from that particular institution were removed from the mailing list. Six individuals stated they were no longer teaching any athletic training specific courses. Two individuals responded stating
they taught courses within the athletic training curriculum, however, they were not certified athletic trainers. Additionally, after checking for spelling errors and subsequent follow-up of e-mail addresses, eighteen e-mails were returned with a non-deliverable status.

The modified population consisted of 947 athletic training educators. Two hundred and sixty valid responses from the modified total of 947 potential participants formed the basis for statistical analysis in this research study. This yielded an adjusted response rate of 27.03%. Furthermore, at least one educator from 167 separate programs responded to the survey, providing representation from 69% of accredited education programs.

In regard to how responses were returned, a typical pattern was followed. The first e-mail correspondence was sent to potential participants on a Friday. Seventy-five valid responses were received on the first day. By the conclusion of the first two weeks, 161 valid responses were received. Sixty valid responses were returned from the second e-mail correspondence. Finally, 39 valid responses were received from the third and final e-mail correspondence.

The demographic section of the survey consisted of questions regarding gender, highest level of education obtained, rank of current position, and age. Information gathered from the demographic data is summarized in Tables 1 - 4.
Table 1

*Respondents by Gender and Age*

<table>
<thead>
<tr>
<th>Gender</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>147</td>
<td>56.5%</td>
</tr>
<tr>
<td>Female</td>
<td>113</td>
<td>43.5%</td>
</tr>
<tr>
<td>Total</td>
<td>260</td>
<td>100.0%</td>
</tr>
</tbody>
</table>
Table 2

*Highest Degree Obtained by Respondents*

<table>
<thead>
<tr>
<th>Degree Obtained</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bachelor's</td>
<td>6</td>
<td>2.3%</td>
</tr>
<tr>
<td>Master's</td>
<td>185</td>
<td>71.2%</td>
</tr>
<tr>
<td>Doctorate</td>
<td>68</td>
<td>26.1%</td>
</tr>
<tr>
<td>Other</td>
<td>1</td>
<td>0.4%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>260</strong></td>
<td><strong>100.0%</strong></td>
</tr>
</tbody>
</table>
Table 3

*Rank of Current Position of Respondents*

<table>
<thead>
<tr>
<th>Rank</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Graduate Assistant</td>
<td>16</td>
<td>6.2%</td>
</tr>
<tr>
<td>Instructor</td>
<td>96</td>
<td>36.9%</td>
</tr>
<tr>
<td>Assistant Professor</td>
<td>88</td>
<td>33.8%</td>
</tr>
<tr>
<td>Associate Professor</td>
<td>29</td>
<td>11.2%</td>
</tr>
<tr>
<td>Professor</td>
<td>20</td>
<td>7.7%</td>
</tr>
<tr>
<td>Other</td>
<td>11</td>
<td>4.2%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>260</strong></td>
<td><strong>100.0%</strong></td>
</tr>
</tbody>
</table>
Table 4

*Age of Respondents*

<table>
<thead>
<tr>
<th>Age</th>
<th>Frequency</th>
<th>Percent</th>
<th>M</th>
<th>SD</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>In years</td>
<td>—</td>
<td>—</td>
<td>36.69</td>
<td>9.69</td>
<td>22 – 68</td>
</tr>
<tr>
<td>&lt; = 33</td>
<td>125</td>
<td>48.1%</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>34 – 45</td>
<td>78</td>
<td>30.0%</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>46 – 56</td>
<td>43</td>
<td>16.5%</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>57 +</td>
<td>13</td>
<td>5.0%</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Missing</td>
<td>1</td>
<td>0.4%</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Total</td>
<td>260</td>
<td>100.0%</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
</tbody>
</table>
Gender

Table 1 illustrates respondents by gender. All 260 participants answered the question regarding gender. Of the 260 participants 147 (56.5%) were male and 113 (43.5%) were female.

Highest Degree Obtained

Table 2 provides information regarding respondents’ highest degree obtained. All 260 participants answered this question. The majority of participants reported they had completed a master’s degree (n = 185, 71.2%). Sixty-eight participants (26.2%) reported having a doctorate, and six participants (2.3%) reported having a bachelor’s degree. One participant (.4%) reported having an “other” qualification. The “other” qualification was listed as an educational specialist. Additionally, one participant noted having obtained two master’s degrees, a master’s of education (MEd) and a master of science in physical therapy (MSPT).

Rank of Current Position

Table 3 provides data regarding rank of current position of respondents. All 260 participants answered this question. Ninety-six participants (36.9%) reported their current position as instructor. Eighty-eight participants (33.8%) reported their current position as assistant professor, 29 participants (11.2%) reported their current position as associate professor, and 20 participants (7.7%) reported their current position as professor. The least reported position was graduate
assistant, with 16 participants (6.2%) employed at this rank. Additionally, 11 participants classified themselves in the “other” category. These “other” ranks included an academic affiliate, an assistant clinical professor, a clinical assistant professor, a clinical associate professor, a clinical coordinator of athletic training, a clinical educator, a clinical instructor, a clinical specialist, a director of sports medicine, a faculty affiliate, and a faculty-in-residence.

Age

Two hundred and fifty-nine participants answered the question regarding age. The range of participants was between 22 and 68 years. The mean age was 36.69 years. As presented in Table 4, age was transformed into four groups of equal distances using the “visual bander” command in SPSS ($\leq 33$, 34-45, 46-56, 57+). A significant majority of participants (78.1%) were 45 years old or younger.

Frequency of Responses

Frequencies were tabulated for the responses to individual items on the survey instrument. Responses for Items One through 23 in “Section 2: Attitudes Towards Instructional Technology” are presented in Table 5. Individual items in Table 5 are paraphrased from the original items in the survey instrument. Please refer to Appendix E for the complete items measured. Items written in a negative manner were reverse scored.
### Table 5

*Attitudes Toward Instructional Technology*

<table>
<thead>
<tr>
<th>Individual Item</th>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SA</td>
</tr>
<tr>
<td>Plays a useful role</td>
<td>54.6%</td>
</tr>
<tr>
<td>Increases productivity</td>
<td>34.6%</td>
</tr>
<tr>
<td>Not important to integrate</td>
<td>8.1%</td>
</tr>
<tr>
<td>Decreases barriers</td>
<td>13.8%</td>
</tr>
<tr>
<td>Students become discouraged</td>
<td>1.2%</td>
</tr>
<tr>
<td>Difficult to incorporate</td>
<td>3.1%</td>
</tr>
<tr>
<td>Covering to mastering information</td>
<td>4.2%</td>
</tr>
<tr>
<td>Important in clinical setting</td>
<td>12.7%</td>
</tr>
<tr>
<td>De-personalizes education</td>
<td>1.9%</td>
</tr>
<tr>
<td>Enhances student learning</td>
<td>17.7%</td>
</tr>
<tr>
<td>Individual Item</td>
<td>Rating</td>
</tr>
<tr>
<td>---------------------------------------</td>
<td>----------</td>
</tr>
<tr>
<td></td>
<td>SA</td>
</tr>
<tr>
<td>Students become overwhelmed</td>
<td>1.5%</td>
</tr>
<tr>
<td>Passive reception to active engagement</td>
<td>—</td>
</tr>
<tr>
<td>Enhances learning in clinical setting</td>
<td>9.2%</td>
</tr>
<tr>
<td>Institutional support</td>
<td>9.6%</td>
</tr>
<tr>
<td>Student-centered environment</td>
<td>9.2%</td>
</tr>
<tr>
<td>Decreases communication</td>
<td>2.3%</td>
</tr>
<tr>
<td>Students obtain more information</td>
<td>9.2%</td>
</tr>
<tr>
<td>Enriches content</td>
<td>18.1%</td>
</tr>
<tr>
<td>Students’ varied learning styles</td>
<td>16.9%</td>
</tr>
</tbody>
</table>
Table 5 (continued)

<table>
<thead>
<tr>
<th>Individual Item</th>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SA</td>
</tr>
<tr>
<td>Too time consuming</td>
<td>2.7%</td>
</tr>
<tr>
<td>Students are distracted</td>
<td>0.4%</td>
</tr>
</tbody>
</table>

*Note.* SA = Strongly Agree, A = Agree, N = Neutral, D = Disagree, SD = Strongly Disagree
Nearly 97% of participants strongly agreed or agreed that instructional technology plays a useful role in athletic training education, and 85% strongly agreed or agreed that the integration of technology into instruction enhances student learning. Participants confirmed that instructional technology: a) enriched the content of courses (18.1% strongly agreed and 63.1% agreed), b) allowed instructors to utilize strategies that take into account students’ varied learning styles (16.9% strongly agreed and 63.1% agreed). Eighty-one percent of the participants strongly agreed or agreed that instructional technology allowed for more flexibility in teaching. Seventy percent of the participants indicated they did not believe students were becoming discouraged by the increased utilization of instructional technologies. In regard to clinical education, 73.1% strongly agreed or agreed that incorporating technology into clinical instruction is important, and 61.1% strongly agreed or agreed that instructional technology in the clinical setting enhanced student learning. Additionally, 98.1% of respondents strongly agreed or agreed that it is important to have institutional support when implementing technology.

On the negative side, 87.3% of participants disagreed or strongly disagreed that the use of instructional technology helps students move from a passive reception of information to active engagement of knowledge. Furthermore, respondents were split between agree (39.6%)
and neutral (36.9%) regarding the use of instructional technology helping students go from simply covering information to mastering information.

Responses for items One through 39 in “Section 3: Instructional Technology Use” are presented in Table 6. Ratings for these items were “never use” (NU) equals one point, “experimented with” (EW) equals two points, “use occasionally” (UO) equals three points, and “use regularly” (UR) equals four points. The most common technologies used on a regular basis were word processing (92.4%), electronic mail (86.5%), and internet browsers (81.2%). These technologies were followed by the regular use of personal desktop computers, presentation software, and spreadsheet programs (78.5%, 75.0%, and 65.4% respectively). The most common instructional technologies reported as being never used were graphic tablets (88.8%), electronic tablets (82.3%), hypermedia (79.6%) and on-line conferences (73.5%). Integrated learning systems and slide projectors closely followed these technologies, as 65.8% of participants reported never using them.

Reliability Results

Internal consistency of the two scales was measured utilizing Cronbach’s coefficient alpha. The instrument had an overall reliability of alpha = .92, indicating that cumulatively the instrument was reliable for measurement in this study. Individually the two sections comprising the instrument indicated high reliability as well. Reliability analysis yielded
<table>
<thead>
<tr>
<th>Individual Item</th>
<th>NU</th>
<th>EW</th>
<th>UO</th>
<th>UR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chalkboard or Whiteboard</td>
<td>5.0%</td>
<td>3.1%</td>
<td>41.9%</td>
<td>48.8%</td>
</tr>
<tr>
<td>Slide Projector</td>
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<td>21.2%</td>
<td>3.1%</td>
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<tr>
<td>Overhead Projector</td>
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<tr>
<td>Video Cassette Recorder</td>
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<td>3.5%</td>
<td>71.5%</td>
<td>13.8%</td>
</tr>
<tr>
<td>Video Camera or Camcorder</td>
<td>28.5%</td>
<td>17.3%</td>
<td>45.4%</td>
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<tr>
<td>Video Projection System</td>
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<td>6.5%</td>
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<td>56.2%</td>
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<tr>
<td>Scanner</td>
<td>23.1%</td>
<td>14.2%</td>
<td>41.9%</td>
<td>18.8%</td>
</tr>
<tr>
<td>Electronic Tablet</td>
<td>82.3%</td>
<td>6.5%</td>
<td>6.2%</td>
<td>2.7%</td>
</tr>
<tr>
<td>Graphic Tablet</td>
<td>88.8%</td>
<td>4.6%</td>
<td>3.5%</td>
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<td>Commercial CD’s</td>
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<td>31.5%</td>
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<tr>
<td>Self-Made CD’s</td>
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Table 6 (continued)

<table>
<thead>
<tr>
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<td></td>
<td>NU</td>
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<tr>
<td>Computer</td>
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</tr>
<tr>
<td>Desktop Computer</td>
<td>7.3%</td>
</tr>
<tr>
<td>Laptop Computer</td>
<td>14.6%</td>
</tr>
<tr>
<td>Digital Still Camera</td>
<td>17.3%</td>
</tr>
<tr>
<td>Interactive Video</td>
<td>50.4%</td>
</tr>
<tr>
<td>Electronic Mail</td>
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<tr>
<td>Internet Browser</td>
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<tr>
<td>On-Line Bulletins</td>
<td>34.6%</td>
</tr>
<tr>
<td>Listserv or Discussion</td>
<td>23.8%</td>
</tr>
<tr>
<td>On-line Conferences</td>
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</tr>
<tr>
<td>On-line Databases</td>
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</tr>
<tr>
<td>Websites Produced by Others</td>
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</tr>
<tr>
<td>Websites Self-Produced</td>
<td>54.6%</td>
</tr>
<tr>
<td>Network-Based</td>
<td>40.4%</td>
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<td>Courseware</td>
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Table 6 (continued)

<table>
<thead>
<tr>
<th>Individual Item</th>
<th>NU</th>
<th>EW</th>
<th>UO</th>
<th>UR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Word Processing</td>
<td>0.4%</td>
<td>—</td>
<td>3.5%</td>
<td>94.2%</td>
</tr>
<tr>
<td>Spreadsheet Programs</td>
<td>4.2%</td>
<td>3.8%</td>
<td>23.8%</td>
<td>65.4%</td>
</tr>
<tr>
<td>Statistical Programs</td>
<td>35.8%</td>
<td>20.0%</td>
<td>26.9%</td>
<td>15.4%</td>
</tr>
<tr>
<td>Database Programs</td>
<td>50.0%</td>
<td>21.5%</td>
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<td>10.0%</td>
</tr>
<tr>
<td>Desktop Publishing</td>
<td>44.6%</td>
<td>26.9%</td>
<td>21.9%</td>
<td>4.6%</td>
</tr>
<tr>
<td>Electronic Publishing</td>
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<td>13.8%</td>
<td>38.1%</td>
<td>28.8%</td>
</tr>
<tr>
<td>Web Publishing</td>
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<td>20.4%</td>
<td>21.9%</td>
<td>16.2%</td>
</tr>
<tr>
<td>Paint/Draw Programs</td>
<td>37.3%</td>
<td>26.2%</td>
<td>25.8%</td>
<td>8.1%</td>
</tr>
<tr>
<td>Presentation Software</td>
<td>3.5%</td>
<td>3.8%</td>
<td>15.8%</td>
<td>75.0%</td>
</tr>
<tr>
<td>Multimedia</td>
<td>13.5%</td>
<td>11.9%</td>
<td>35.4%</td>
<td>38.1%</td>
</tr>
<tr>
<td>Instructional Mgt</td>
<td>60.0%</td>
<td>16.5%</td>
<td>13.8%</td>
<td>6.5%</td>
</tr>
<tr>
<td>Hypermedia</td>
<td>79.6%</td>
<td>10.4%</td>
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<td>1.2%</td>
</tr>
<tr>
<td>Integrated Learning</td>
<td>65.8%</td>
<td>16.2%</td>
<td>13.1%</td>
<td>2.3%</td>
</tr>
</tbody>
</table>

Note. NU = Never Use, EW = Experimented With, UO = Use Occasionally, UR = Use Regularly
an alpha coefficient of .90 for the attitude scale and an alpha coefficient of .91 for the extent of utilization scale. Item analysis revealed both scales functioned well with no negatively scored items.

Assumption Testing for Two-Way ANOVA

Before utilizing a two-way Analysis of Variance (ANOVA) to test the hypotheses, assumptions for a two-way ANOVA were considered. There are primarily four assumptions that must be met when using a two-way ANOVA: a) independence of observations, b) variables being measured on an interval or ratio scale, c) normal distribution of observations, and d) homogeneity of variance.

The assumption of independent observations was addressed by including the entire population in the study. Participants were instructed to complete the survey independently. Although some dependency may have occurred due to multiple participants at institutions, the independence of observations assumption was tenable.

When using two-way ANOVA for data analysis the scale of measurement for the dependent variable must be interval or ratio. The measures used on an attitude or opinion survey instrument often fall between an ordinal and an interval scale. However, when using a Likert scale it is “reasonable to assume that there is a fairly close relationship between the spacing of the possible responses and the underlying attitudes they are attempting to measure” (Harris, 1998, p. 18).
Therefore, a two-way ANOVA is often used with measures that fall between the ordinal and interval level of measurement.

According to Stevens (1996) there are several methods, graphical and non-graphical, of testing the normality assumption. The researcher chose to examine the assumption graphically for each group using the “Explore” feature of SPSS. Additionally, this was coupled with the non-graphical Shapiro-Wilks statistical test for normality for each group. Histograms and normal probability plots were found to be satisfactory. Likewise, when tested at alpha = .05 level, the Shapiro-Wilks test was not significant for all eight cells, indicating no group deviated from normality. Furthermore, none of the cells were shown to have any normality problems when tested by the 95% confidence interval for the skewness and kurtosis. Therefore, it was decided that the normality assumption was tenable.

The Levene test was applied to check the assumption of homogeneity of variance for each group. The Levene test was not significant ($p = .09$) for groups when looking at the summated score for attitude as the dependent variable. Nor was it significant ($p = .21$) for the summated score for extent of utilization as the dependent variable. Thus, the distributions in each cell were homogenous. Therefore, the homogeneity of variance assumption was found to be tenable.
Statistical Analysis to Test Null Hypotheses

The purpose of the study was to examine athletic training educators’ attitudes toward instructional technology and their extent of utilization of that technology. Statistical analyses were carried out using SPSS. Descriptive statistics were computed, followed by a two-way ANOVA.

Differences in Attitudes by Gender and Age: HO₁, HO₂, and HO₃

Hypothesis One was used to determine if there was a difference between genders for attitudes toward instructional technology. Hypothesis Two was used to determine if there were differences among age groups. The two hypotheses stated that there would be no difference between genders and no difference between age groups. Hypothesis Three was used to determine if an interaction effect existed between gender and age and attitude towards instructional technology. Additionally, Hypothesis Three stated an interaction effect would not exist.

The means and standard deviations for the variable of “attitude towards instructional technology” were similar for males and females and for all age groups (see Table 7). The distribution provides a total mean score of 86.05 across genders and age groups. This indicated an overall positive attitude towards instructional technology. Females between the ages of 46 and 56 responded with the most positive attitude with a mean
### Table 7

**Means and Standard Deviations of Attitudes Toward Instructional Technology by Gender and Age**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>SD</th>
<th>Cases</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gender</strong></td>
<td><strong>Age</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>&lt; = 33</td>
<td>86.93</td>
<td>9.99</td>
</tr>
<tr>
<td></td>
<td>34 – 45</td>
<td>85.13</td>
<td>11.13</td>
</tr>
<tr>
<td></td>
<td>46 - 56</td>
<td>84.84</td>
<td>9.39</td>
</tr>
<tr>
<td></td>
<td>57 +</td>
<td>82.10</td>
<td>8.89</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>85.58</td>
<td>10.17</td>
</tr>
<tr>
<td>Female</td>
<td>&lt; = 33</td>
<td>86.56</td>
<td>9.09</td>
</tr>
<tr>
<td></td>
<td>34 – 45</td>
<td>84.77</td>
<td>12.16</td>
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<tr>
<td></td>
<td>46 - 56</td>
<td>92.33</td>
<td>7.58</td>
</tr>
<tr>
<td></td>
<td>57 +</td>
<td>86.00</td>
<td>5.29</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>86.67</td>
<td>9.95</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>&lt; = 33</td>
<td>86.73</td>
<td>9.49</td>
</tr>
<tr>
<td></td>
<td>34 – 45</td>
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<td>11.47</td>
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<tr>
<td></td>
<td>46 – 56</td>
<td>86.93</td>
<td>9.47</td>
</tr>
<tr>
<td></td>
<td>57 +</td>
<td>83.00</td>
<td>8.18</td>
</tr>
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</table>
Table 7 (continued)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>SD</th>
<th>Cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>86.05</td>
<td>10.07</td>
<td>258</td>
</tr>
</tbody>
</table>
score of 92.33, while males 57 years and older had the lowest mean score of 82.10.

Results from the analysis of a 2 x 4 ANOVA with “attitude towards instructional technology” as the dependent variable are presented in Table 8. The two-way ANOVA revealed no statistically significant differences for each of the main effects of gender and age, $F(1, 258) = 1.78, p > .05$, and $F(3, 258) = 1.28, p > .05$ respectively for the specified .05 significance level. Additionally, data indicated there were no significant interaction effect between age and gender and attitude towards instructional technology, $F(3, 258) = 1.57, p > .05$. Therefore, the decision was to fail to reject the null for Hypotheses One, Two, and Three.

*Differences in Extent of Utilization by Gender and Age: HO4, HO5, and HO6*

Hypothesis Four was used to test if there was a difference between genders for extent of utilization of instructional technology. Hypothesis Five involved any differences among age groups in regard to extent of utilization. The two hypotheses stated that there would be no difference between genders and no difference between age groups. Hypothesis Six was used to determine if an interaction effect existed between gender and age and extent of utilization. Additionally, Hypothesis Six stated an interaction effect would not exist.
### Table 8

*Two-Way ANOVA – Attitudes Toward Instructional Technology*

<table>
<thead>
<tr>
<th>Source of Variance</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean</th>
<th>F</th>
<th>p</th>
<th>n²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>179.36</td>
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<td>179.36</td>
<td>1.78</td>
<td>.18</td>
<td>.01</td>
</tr>
<tr>
<td>Age</td>
<td>387.45</td>
<td>3</td>
<td>129.15</td>
<td>1.28</td>
<td>.28</td>
<td>.02</td>
</tr>
<tr>
<td>Gender x Age</td>
<td>476.15</td>
<td>3</td>
<td>158.72</td>
<td>1.57</td>
<td>.20</td>
<td>.02</td>
</tr>
<tr>
<td>Total</td>
<td>1936469.00</td>
<td>258</td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>
The means and standard deviations for the variable of “extent of utilization of instructional technology” for males and females and all age groups are presented in Table 9. Overall, participants indicated regular use of instructional technology with a total mean score of 96.78. The highest mean score, 103.50 was reported for females between 46 and 56 years old, while males in the same age group had a mean score of 90.10. The lowest mean score was found to be 81.33 for females 57 years and older.

Results from the analysis of a 2 x 4 ANOVA with “extent of utilization of instructional technology” as the dependent variable are presented in Table 10. The two-way ANOVA indicated no statistically significant result for each of the main effects of gender and age, F (1, 255) = .03, p > .05, and F (3, 255) = 1.32, p > .05 respectively for the specified .05 significance level. The decision was to fail to reject the null for Hypotheses Four and Five.

On the contrary, data did indicate a significant interaction effect between age and gender and extent of utilization, F (3, 255) = 3.08, p < .05. Therefore, the decision was to reject the null for Hypothesis Six. Additionally, the effect size for the significant interaction was found to be .04. This indicates a small to medium effect based on Cohen’s classifications.
Table 9

*Means and Standard Deviations of Extent of Utilization of Instructional Technology by Gender and Age*

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>SD</th>
<th>Cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>&lt; = 33</td>
<td>100.42</td>
<td>16.13</td>
</tr>
<tr>
<td></td>
<td>34 – 45</td>
<td>98.23</td>
<td>18.97</td>
</tr>
<tr>
<td></td>
<td>46 - 56</td>
<td>90.10</td>
<td>20.00</td>
</tr>
<tr>
<td></td>
<td>57 +</td>
<td>92.20</td>
<td>23.87</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>97.04</td>
<td>18.73</td>
</tr>
<tr>
<td>Female</td>
<td>&lt; = 33</td>
<td>94.53</td>
<td>14.82</td>
</tr>
<tr>
<td></td>
<td>34 – 45</td>
<td>99.29</td>
<td>17.24</td>
</tr>
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<td></td>
<td>46 - 56</td>
<td>103.50</td>
<td>14.67</td>
</tr>
<tr>
<td></td>
<td>57 +</td>
<td>81.33</td>
<td>28.54</td>
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<td></td>
<td>Total</td>
<td>96.46</td>
<td>16.15</td>
</tr>
<tr>
<td>Total</td>
<td>&lt; = 33</td>
<td>97.56</td>
<td>15.67</td>
</tr>
<tr>
<td></td>
<td>34 – 45</td>
<td>98.65</td>
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<td></td>
<td>46 – 56</td>
<td>94.02</td>
<td>19.42</td>
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<tr>
<td></td>
<td>57 +</td>
<td>89.69</td>
<td>24.20</td>
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Table 9 (continued)

<table>
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<th>Variable</th>
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<th>Cases</th>
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<tbody>
<tr>
<td>Gender</td>
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</tr>
<tr>
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<td></td>
</tr>
<tr>
<td>Total</td>
<td>96.78</td>
<td>17.61</td>
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Table 10

_Two-Way ANOVA – Extent of Utilization of Instructional Technology_

<table>
<thead>
<tr>
<th>Source of Variance</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean</th>
<th>F</th>
<th>p</th>
<th>n²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
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<td>1</td>
<td>8.33</td>
<td>0.03</td>
<td>.87</td>
<td>.00</td>
</tr>
<tr>
<td>Age</td>
<td>1194.97</td>
<td>3</td>
<td>398.32</td>
<td>1.32</td>
<td>.27</td>
<td>.02</td>
</tr>
<tr>
<td>Gender x Age</td>
<td>2792.11</td>
<td>3</td>
<td>930.70</td>
<td>3.08</td>
<td>.03*</td>
<td>.04</td>
</tr>
<tr>
<td>Total</td>
<td>2467217.00</td>
<td>255</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* = significant at .05 level
The statistically significant interaction indicated, when considering educators’ extent of utilization of instructional technology, the effect of age depends on gender and the effect of gender depends on an individual’s age. In order to determine the meaning of the interaction, the researcher constructed a graph (see Figure 1). The mean scores for extent of utilization of instructional technology were graphed along the y-axis and age and gender were plotted along the x-axis.

Figure One illustrates that males 57 years and older utilized instructional technologies to a greater extent than females in the same age category. Males within this age group had a mean score of 92.20 while females had a mean score of 81.33, for a difference of 10.87 points. In a similar contrast, females between the ages of 46 and 56 indicated a greater extent of utilization of instructional technologies (M = 103.50) than males within the same age group (M = 90.10). The net difference in mean scores was 13.4 points. No significant differences are indicated between males and females in the age groups of 33 years and younger and 34 to 45 years old.

Supplemental Analyses

A test of simple main effects was used to further explore the significant interaction effect between gender and age and extent of utilization of instructional technology. Gender was considered the moderator variable and age was the focal variable. This enabled the
Figure 1. The interaction of age and gender for extent of utilization of instructional technology scores under the two-way ANOVA design.
researcher to conduct a separate ANOVA for males and females. Results indicated no significant differences between age groups for females, \( F(3,108) = 1.96, p > .05 \). However, results did indicate a significant difference between age groups for males, \( F(3,140) = 2.69, p < .05 \). A Tukey-Kramer post-hoc analysis was utilized to determine where differences existed. A significant difference, \( F(3, 140) = 3.76, p < .05 \), was noted between males 33 years and younger (\( M = 100.60 \)) and males 46 to 56 years (\( M = 90.10 \)).

**Pearson Correlation Analyses**

A Pearson correlation analysis was utilized to determine the relationship between age and the two dependent variables, attitude toward and extent of utilization of instructional technology. A second analysis was done to determine the relationship between the two dependent variables. The correlation between age and attitude was not statistically significant, \( r(259) = -.04, p > .05 \). Additionally, the correlation between age and extent of utilization was not statistically significant \( r(256) = -.06, p > .05 \). However, not surprisingly, \( r(257) = .31, p < .01 \) was significant for the relationship between attitude and extent of utilization. This indicated that respondents with a more positive attitude towards instructional technology utilized it to a greater extent, and respondents with a less favorable attitude towards instructional technology utilized it to a lesser extent.
**Qualitative Data**

Number 24 in “Section 2: Attitude Towards Instructional Technology” was an open-ended item utilized to gather qualitative data. It stated, “overall, please indicate your willingness to use instructional technology within athletic training education programs.” Two hundred and thirty-seven participants responded to this item. Several themes regarding instructional technology were determined from qualitative data, including: 1) a willingness to utilize, 2) a moderate willingness to utilize, 3) benefits of utilization, 4) utilization in clinical education, 5) a concern with the amount of time it takes to implement techniques, 6) a concern with institutional support, 7) a concern with lack of knowledge and ability, 8) an emphasis that it should be only one of several tools or techniques utilized, 9) a reluctance to utilize, 10) a concern with over-reliance on and excess utilization, and 11) additional comments. Qualitative data are discussed in greater detail in Chapter Five. All comments can be found in appendices H through R.

**Summary**

This chapter presented the basic demographics, result of internal consistency, and descriptive statistics for the major hypotheses. The results of the six research questions and hypotheses were also presented. Findings from two-way ANOVA failed to reject null Hypotheses One, Two,
Three, Four and Five. Findings supported rejection of null Hypothesis Six. Statistical analyses showed that:

1. There are no statistically significant differences between male and female athletic training educators’ attitudes toward instructional technology.

2. There are no statistically significant differences in athletic training educators’ attitudes toward instructional technology based on age.

3. There is no interaction effect between age and gender and attitudes toward instructional technology.

4. There are no statistically significant differences between male and female athletic training educators’ extent of utilization of instructional technology in their teaching.

5. There are no statistically significant differences in athletic training educators’ extent of utilization of instructional technology in their teaching based on age.

6. A significant interaction effect does exist between age and gender and extent of utilization of instructional technology.

7. There is a significant, positive correlation between attitude towards instructional technology and extent of utilization of that technology.
Chapter Five: Summary, Limitations, Conclusions, Practical Implications, and Recommendations

The previous four chapters are summarized in this chapter. First a summary of the study and discussion of the overall findings are presented. Next, limitations of the study are discussed. Followed by conclusions and practical implications from analyses and findings. Finally, recommendations for further study are suggested.

Summary of the Study

The purpose of this study was to investigate athletic training educators’ attitudes toward instructional technology and the extent of their utilization of that technology. Previous literature on technology in athletic training education focused on the use of computer assisted instruction and multimedia computer programs, and comparing their use to more traditional classroom techniques (Boscolo, Himberg, & Welsh, 2002; Buxton, Speitel, & Holgen, 1995; Chen, Buxton, Holgen, & Speitel, 1995; Deere, Wright, Solomon, & Whitehill, 1995; Lebsack Wiksten, Patterson, Antonio, De La Cruz, & Buxton, 1998; Wiksten, Patterson, Voigt, & LeMaster, 1999; Wiksten, Spanjer, & LaMaster, 2002). Further literature supported the use of technology in athletic training education (Gould, Ransome, Conry & Chen, 1995; Tsuchiya, 1995).
Instructional technology is an area that has received increased attention in recent years. The main focus of attention has been the pros and cons of utilizing instructional technology techniques. Faculty attitudes toward and utilization of instructional technology comprise an important issue in higher education: "As the computer age advances, the skill levels of faculty usage and instruction via computer become a point of pride for an institution" (Lebideker, 1997, p. 131). Prospective parents, students, and donors will gravitate toward institutions where faculty are keeping current with technological advances.

This researcher believes the use of instructional technology in athletic training education will benefit student athletic trainers and the profession as a whole. Technology’s role in athletic training is ever expanding and students will be exposed to technology whether or not instructors utilize it. It is uncertain whether the diffusion of instructional technology is taking place in athletic training education. Once this is determined, appropriate adoption strategies can be designed that appeal to all faculty members and take into account the incentives, training programs and barriers identified by each group (Anderson, Varnhagen, & Campbell 1998).

Problem

The problem of this study was that little previous research and few data existed regarding attitudes toward and the role of instructional
technology in athletic training education programs. Therefore, not enough was known about faculty attitudes' toward and the extent of utilization of instructional technology. The researcher wanted to determine attitudes of faculty members teaching in Commission on Accreditation of Allied Health Education Programs (CAAHEP)-accredited, entry-level athletic training education programs towards instructional technology. Additionally, the researcher wanted to examine educators' extent of utilization of instructional technology techniques.

Six null hypotheses were tested for this study. The first, second, and third null hypotheses were combined. This combination of hypotheses was designed to investigate the relationship between gender and age and attitude towards instructional technology. These variables had not before been related within the athletic training literature.

Null Hypotheses Four, Five and Six were combined to examine the relationship between gender and age and the extent of utilization of instructional technology. This relationship had not been studied.

Methodology

A quantitative research method was utilized. The researcher developed the survey instrument used in this study to measure attitudes toward and extent of utilization of instructional technology. A pilot study was conducted to determine if all items represented in the survey were
adequate for measuring attitudes and extent of utilization appropriately. The instrument was then modified accordingly.

The study included certified athletic trainers teaching in CAAHEP-accredited, entry-level athletic training education programs. The target population included 983 educators. However, four of those individuals were excluded because they did not have a working e-mail address. Therefore, the study included 979 faculty members from 243 accredited programs.

Participants in this study were sent an electronic mail correspondence explaining the research, along with a link to complete the on-line survey. This procedure was repeated two weeks later, for non-respondents, with a second electronic mailing emphasizing the importance of the study. This was followed by a third and final mailing two weeks later. The total return of usable survey instruments was 260 for a response rate of 27.03%. Additionally, at least one educator from 167 of the 242 CAAHEP-accredited, entry-level athletic training education programs provided valid responses to the on-line survey. Thus, 69% of the total programs were represented.

Data were captured using the Cardiff TELEform software program. As data were captured and processed they were exported to the Statistical Package for the Social Sciences (SPSS) Windows, Version 12.0. Data were then analyzed using SPSS software. The analysis of data
included the descriptive statistics of frequencies, means, and standard deviations for Research Questions One, Two and Three. In addition, a two-way ANOVA design was implemented for Research Questions Four through Nine.

Research Questions One, Two and Three were examined utilizing descriptive statistics. Research Questions Four (HO₁), Five (HO₂), and Six (HO₃) were tested in combination using a two-way ANOVA. Gender (male and female) and age (≤33, 34–45, 46-56, 57+) were the independent variables. The summated score for attitude was the dependent variable. Research Questions Seven (HO₄), Eight (HO₅), and Nine (HO₆) were also combined for testing purposes. A two-way ANOVA was utilized with gender (male and female) and age (≤33, 34–45, 46-56, 57+) as the independent variables and the summated scores for extent of utilization as the dependent variable.

Research Questions One, Two, and Three

Demographics of respondents. The demographic information provided from the questionnaire indicated similarities and differences among respondents. The majority of participants were 33 years old or younger and had earned a master’s degree. In regard to rank of current position, participants ranged from graduate assistants to professors, with the majority holding the rank of instructor.
Attitudes toward instructional technology. Findings from this study indicated a positive attitude towards instructional technology in athletic training education. Nearly all (97%) of the participants indicated instructional technology plays a useful role in athletic training education and its incorporation can help enhance student learning. Participants reaffirmed research by Passerini and Granger (2000) and Wiksten (et al., 2002) when 80% emphasized instructional technology allowed instructors to utilize strategies that take into account students varied learning styles. Furthermore, the majority (61%) of athletic training educators indicated that incorporating instructional technology into clinical education was important and can enhance student learning. Additionally, participants agreed that instructional technology allowed for increased flexibility and a means for enriching course content.

Participants from this study disagreed with research by Baldwin (1998) and Garland (1995) that an increased utilization of instructional technology often causes students to become discouraged, distracted, or overwhelmed. However, it is noted that the research by Baldwin and Garland is dated. This researcher believes that today’s students are more comfortable with technology in general, for more youth are growing up utilizing technology at an earlier age.

Contrary to research by Beggs (2000), Byron (1995), and Garland, participants indicated that time is becoming less of a barrier to
incorporating instructional technology. Half of all participants indicated it is not too time consuming, while nearly 28% were neutral on this issue.

Participants in this study did not support some conclusions drawn by Kozma and Johnston (1991) regarding the use of instructional technology in education. A strong majority of respondents (87%) indicated they did not believe that utilizing instructional technology helps students move from a passive reception of information to active engagement of knowledge. Furthermore, respondents were split between the categories of “agree”, “neutral”, and “disagree” regarding whether the use of instructional technology helps students go from simply covering information to mastering the information.

Interestingly, 98.1% of respondents indicated that it is important to have institutional support when implementing technology. Lack of institutional support is commonly cited as a barrier to the adoption of instructional technologies (Baldwin, 1998; Moran, 1998; O’Banion, 1997). Although participants cited the importance of support, they still had an overall positive attitude towards instructional technology.

**Extent of utilization of instructional technology.** Findings from this study suggest instructional technology is being utilized in athletic training education. Different technologies are being utilized to varying extents. Similar to research presented in the review of literature, the
most common technologies used on a regular basis were word processing, e-mail, personal desktop computers and presentation software. In addition to these, internet browsers and spreadsheet programs were noted as being utilized regularly. The least utilized instructional technologies were graphic tablets, electronic tablets, hypermedia, on-line conferences, integrated learning systems and slide projectors. These findings support research by Groves and Zemel (2002) suggesting there is a greater level with “tool technologies” (e.g. word processing and spreadsheets) and tentativeness toward “new technologies” (e.g. multimedia, distance learning, and computer-aided instruction) (p. 59).

Research Questions Four Through Nine

*Differences in attitudes by gender and age: HO₁, HO₂, and HO₃.*

Hypothesis One stated that there was no difference between genders for attitudes toward instructional technology. Hypothesis Two stated that there was no difference among age groups in regard to attitude. Hypothesis Three concerned any interaction effect that might exist between gender and age with attitude towards instructional technology.

The resulting decision was to fail to reject the null hypotheses for the main effects of gender and age as well as for the interaction effect. Gender and age did not relate to athletic training educators’ attitudes
toward instructional technology, alone or in combination. The average total mean for the summated score of attitude was 86.05. This indicated an overall positive attitude towards the use of instructional technology in athletic training education programs.

After re-conceptualizing the age variable, further analysis supported that no significant differences between age and attitude towards instructional technology existed. Furthermore, rank of current position and highest degree obtained were analyzed utilizing ANOVA. No significant differences were noted between these variables and attitudes toward instructional technology.

The results of this analysis indicated age and gender do not play as large of a role on attitude towards instructional technology as was determined in previous studies (Anderson et al., 1998; Campbell and Varnhagen, 2002; Spotts, Bowman, and Mertz, 1997). Anderson and others reported younger faculty as having a more positive attitude towards instructional technology than older faculty. Campbell and Varnhagen and Spotts and others concluded that females have a more negative attitude towards technology than males do.

*Differences in extent of utilization by gender and age: HO4, HO5, and HO6.* Hypothesis Four stated there was no difference between genders for extent of utilization of instructional technology. Hypothesis Five stated that there was no difference within age groups in regard to extent
of utilization. Hypothesis Six concerned any interaction effect that might exist between gender and age with extent of utilization of instructional technology.

The resulting decision was to fail to reject the null hypothesis for the main effects of gender and age and extent of utilization of instructional technology. Gender and age did not relate to athletic training educators’ extent of utilization of instructional technology, when considering each individually. The average total mean score for extent of utilization was 96.78, indicating respondents reported regular use of instructional technology as a whole by athletic training educators.

To further support these decisions, rank of current position and highest degree obtained were analyzed utilizing ANOVA. No significant differences were noted between these variables and extent of utilization of instructional technology.

These findings support previous research regarding the effects of gender and extent of utilization of instructional technology. Lucas (2002) noted few differences in the frequency of use of web-based technology by men and women. Schifter (2002) reported no significant differences in the use of technology utilized in teaching based on gender. Furthermore, Lebediker (1997) reported no significant gender differences for technology use in the classroom.
These findings differ from the majority of previous research regarding the effects of age and the extent of utilization of instructional technology. Warburton, Chen, and Bradburn (2002) reported a negative correlation with age and the use of some instructional technologies. As age of faculty increased, use of e-mail for instructional purposes and use of class-based websites decreased. Lebediker (1997) noted a significant decrease in utilization of technology as age increased. Anderson (et al., 1998) noted younger faculty utilized teaching technologies to a greater extent than older faculty members who tended to utilize instructional technology less. Although this study found a negative correlation between age and the extent of utilization of instructional technology, it was not significant. Similar to findings from this study, Schifter (2002) reported no significant difference in use of technology utilized in teaching based on age alone; perhaps indicating age is playing less of a role in more recent years.

For Hypothesis Six the decision was to reject the null hypothesis. There was a statistically significant interaction effect of gender and age and the extent of utilization of instructional technology. Re-conceptualizing age groups further explored the significant interaction. Resultant data analyses produced similar findings when individuals of similar ages remained in the same groups. However, when respondents were grouped into categories with equal n’s, significant differences did
not exist. The researcher believed this is, in part, due to the lower response rate from individuals aged 55 and older.

The significant interaction effect indicates, when considering educators’ extent of utilization of instructional technology, the effect of age depends on gender and the effect of gender depends on the individual’s age. However, it is important to note the effect size for the interaction was found to be .04. Thus, indicating a modest percentage of the interaction being due to gender and age.

When analyzing the interaction effect, results were interesting. In the age group of 33 years and younger, males and females reported similar scores for extent of utilization. Similarly, scores were virtually the same for the 34 to 45 age group. Differences did appear for the remaining two age groups. This study found that females aged 46 to 56 years utilized instructional technology to a greater extent than males. When looking at qualitative data for this particular age group, five of the male respondents expressed a concern for the amount of time it takes to incorporate instructional technology, while none of the females in this age group expressed the same concern.

On the contrary, for the age group 57 years and older, males utilized instructional technology to a greater extent than females. However, caution should be used when interpreting these results. As discussed in the limitations, participants aged 57 years and older were
under-represented in this study. Furthermore, one female within the highest age group scored particularly low (a summated score of 49, with five items missing responses). The extremely low score would have certainly affected the resultant analysis.

Further analysis utilizing a test of simple main effects was performed. Results indicated no significant differences between age groups for females. However, results did indicate a significant difference between age groups for males. A Tukey-Kramer post-hoc analysis was utilized to determine that males 33 years and younger utilized instructional technology to a greater extent than males 46 to 56 years old.

Qualitative Data

Willingness to utilize. Participants provided useful qualitative data by answering the open-ended item regarding their willingness to incorporate instructional technology. Most respondents indicated a willingness to utilize instructional technology, emphasizing their regular use and its important role in a “new age education.” One respondent stated, “students today have grown-up using the technology and are very familiar with it, and I believe students relate to it better. With good support and resources there is no excuse not to use instructional technology.” Another participant reported, “I believe that today’s educational environment makes the use of instructional technology more
important than ever before. I encourage its use in our ATE program and attempt to use it when appropriate.” Furthermore, one respondent affirmed the importance of instructional technology by stating that it has a place in all athletic training programs. Additionally, it was reported that the use of instructional technology helps prepare students for the work setting.

_Benefits of utilization._ Several respondents reported benefits of utilizing instructional technology in athletic training education. It was noted as being useful in disseminating information efficiently and in an interesting manner. It can be utilized as a powerful tool to bring new ideas to the students and increase communication and comprehension of topics. Furthermore, it provides a means for students to synthesize and apply complex concepts. One respondent stated that technology allows you to provide an “instant practical application.” Presentation software can allow students an increased opportunity to listen and think about topics instead of hurriedly writing notes. Instructional technology can help increase flexibility for instructors, provide a means for teaching to students with varied learning styles, and assist in keeping the class on-task. Overall, several respondents noted that the utilization of instructional technology is important to student learning and retention, provides a means for applying theoretical concepts, adds variety, and enables students to learn independently.
Concern with utilization. Respondents also noted disadvantages to incorporating instructional technology. Twenty-five comments indicated a concern for the amount of time involved with setting-up and incorporating techniques. Several respondents indicated a concern with taking time away from other responsibilities, particularly if they held a dual position with an athletic training clinical assignment. Some respondents were apprehensive that utilizing too much instructional technology would de-personalize the educational experience and be abused to the point where instructors would replace themselves. There was a concern that students might become too dependent on the technology, making them lazy and expecting everything to be spoon fed to them. One respondent stated that, “today’s student tends to expect technology in the classroom, but I don’t think it helps with conveying concepts or retention of information.” Additionally, one participant expressed a concern that instructional technology might replace other, more meaningful experiences, and that students benefit more from practical, more traditional techniques.

Participants stated that instructional technology should be considered a “tool” and caution needs to be exercised so that it is not abused. It should be incorporated in a way that engages students and doesn’t allow them to become passive. Others emphasized that it is not the technology that enhances teaching and learning but the instructor: “I
(also) believe that it is a quality instructor not the instructional technology that determines the quality of learning.” While one respondent emphasized that the extent of utilization of instructional technology depends on the individual instructor, “certain instructors utilize technology well while others perform better with discussion.” It is important to incorporate technology in a way that engages the student. Respondents indicated instructional technology is useful if used as a supplement, not as the primary source of information. It should be used in conjunction with several other teaching techniques and it certainly should not replace hands-on experience.

**Utilization in clinical education.** Few respondents noted an incorporation of instructional technology in the clinical setting. Some did mention they would utilize technology in the clinical setting if they had an appropriate opportunity. One participant mentioned they were currently developing a database to record student clinical skills.

**Institutional support.** A common theme among responses involved the importance of institutional support. Many noted that the lack of funding makes it difficult to incorporate instructional technology effectively and efficiently. Another concern was having access to appropriate facilities, equipment, materials, and software. Additionally, support services are often understaffed and cannot keep up with technological advances. One participant commented on the frustration
involved with breakdowns in equipment. Furthermore, there was a concern for the lack of credit from administrators for additional work involved with incorporating instructional technology techniques. The final area expressed by respondents dealt with lack of knowledge of instructional technology techniques.

**Concern with lack of knowledge.** Several participants stated they were willing to incorporate instructional technology, however, they did not feel adequately trained to use multiple strategies, they were unsure how to incorporate it or they had attempted to incorporate it and had met with varying levels of success. One respondent indicated they were unsure when one strategy might be more appropriate than another, while a different participant was unsure of the strengths and weaknesses of various strategies. Furthermore, some reported they didn’t know much about what was available, and some of what they were familiar with proved difficult to use. It was apparent some participants were willing to utilize instructional technology techniques, but didn’t know where to start. One participant wrote that he/she, “could use some instruction regarding technology that could be used in the classroom.”

**Reluctance to utilize.** Few (three) participants noted a reluctance to incorporate and utilize instructional technology. One participant stated he was content with what he had already done. Another stated, “I believe
in more hands on learning.” The third participant indicated he was not interested in changing his materials over to PowerPoint.

**Limitations**

Findings and conclusions have been considered with an awareness of limitations of the study. The sample size did not reach the desired level determined a priori for the study. Therefore it may not have reached a sufficient level of power. Only 260 valid responses were attained from an original 979 potential participants. This yielded a response rate of 26.56%. The original research design called for 352 participants. Several possible reasons for a low response rate are provided.

One concern regarding the low response rate was the limitation of the Cardiff TELEform software used to convert the questionnaire to an electronic document. This particular software was chosen in consultation with an individual who had created and organized several on-line questionnaires. The limitations of the software were discovered after the questionnaire had been posted and responses were being received. It was determined that the questionnaire could not be read when utilizing a Macintosh computer. Additionally, the questionnaire worked most efficiently when it was viewed and completed using Internet Explorer version 6.0 or version 5.5 sp2 or Netscape Navigator version 6.2.
Another concern regarding the low response rate was the number of on-line questionnaire requests being received by certified athletic trainers. The researcher alone received five requests to complete an on-line questionnaire within the first two weeks of e-mailing her request to potential participants. It is believed that the inundation of such requests may have become overwhelming for potential participants, thus affecting their willingness to participate.

A further limitation involved the use of an electronic survey. Utilizing technology as the sole means of assessing attitudes toward and extent of utilization of technology may not be appropriate. The electronic format may limit the response rate by not including everyone in the sample. Additionally, overall perceptions and resulting data analyses may result in a “halo effect.” Responses may be limited to participants who are most comfortable utilizing technology.

The final limitation noted by the researcher deals with the age of respondents. The mean age of respondents was 36.7 years. The majority of respondents (125) were 33 years old or younger. Only 13 participants reported being 57 years or older. Therefore, athletic training educators 57 years and older may be under-represented in this study.

**Conclusions**

This study has increased the knowledge base regarding faculty attitudes toward the use of instructional technologies and the extent of
utilization of instructional technologies in CAAHEP-accredited, entry-level athletic training education programs in the United States. Several conclusions can be rendered from the findings and analysis of data.

1. Findings from the study failed to determine any significant differences in attitudes towards instructional technology based on gender and age. These findings have helped diminish some of the obvious targets (gender and age) for differences in attitudes towards instructional technology.

2. Findings indicated an interaction effect between gender and age and the extent of utilization of instructional technology. Findings indicate females between 46 to 56 years old utilize instructional technology to a greater extent than males the same age. On the contrary, males 57 years and older utilize instructional technology to a greater extent than females in the same age group.

3. Overall athletic training educators have a positive attitude towards instructional technology.

4. Overall athletic training educators are willing to incorporate instructional technology techniques.

5. Word processing, e-mail, Internet browsers and desktop computers are the top four instructional technologies being utilized by athletic training educators.
6. Electronic tables, graphic tablets, hypermedia, and on-line conferences are the four instructional technologies least utilized by athletic training educators.

7. There is a significant, positive correlation between attitude towards instructional technology and extent of utilization of that technology.

**Practical Implications**

Based on the review of literature, findings, and conclusions, the following practical implications were determined.

1. Gender and age differences should not be taken into account when determining needs of faculty for professional development in the area of instructional technology.

2. Several respondents noted the importance of institutional support when implementing instructional technology; therefore, institutions should provide an active program of support and consultation for faculty members.

3. Participants indicated a lack of knowledge in utilizing instructional technology techniques; hence, institutions should provide multiple training opportunities in using instructional technology.

4. Several participants noted they were not aware of what was available or how to incorporate instructional technology appropriately. Therefore, athletic training educators who are successful with incorporating instructional technology techniques should share their
methods, in non-threatening ways, with other athletic training educators.

5. It is important for educators to find a level of utilization of instructional technology that is appropriate for them and their students.

6. Utilizing instructional technology should not be the sole method for teaching. It should be thought of as one of several tools used to enhance the teaching and learning environment.

Recommendations for Further Study

The following recommendations for further study are made.

1. This study should be replicated. The existing instrument indicates significant reliability. However, a larger sample size should be utilized.

2. A study to further explore the statistically significant interaction effect of gender and age and extent of utilization of instructional technology should be conducted.

3. Exploration of “lifespan work habits” in relation to utilization of instructional technology should be explored.

4. Based on the timeline of responses, researchers utilizing an electronic format should reconsider the time for follow-up reminders. A shorter time-span may result in additional responses.
5. Researchers utilizing an electronic format for data collection should consider traditional follow-up mailings to non-respondents.

6. Several respondents indicated the importance of institutional support when implementing instructional technology; hence, further research regarding this issue is warranted.

7. Several respondents indicated the importance of access to various instructional technologies; hence, further research regarding this issue is warranted.

8. Further study regarding how to appropriately implement technology into clinical education may prove useful.

9. Student’s attitudes toward instructional technology should be explored and compared to instructors’ attitudes.

10. Student’s expectations in relation to instructor’s perceived expectations of students in regard to the use of instructional technology should be further explored.

11. This study should be replicated in the future to determine if attitudes toward instructional technology or extent of utilization of that technology has evolved as changes in higher education continue to occur.
References

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Appendix A

Institutional Review Board Exempt Status Document
A determination has been made that the following research study is exempt from IRB review because it involves:

Category 2 research involving the use of educational tests, survey procedures, interview procedures or observation of public behavior.

Project Title: A Study of Athletic Training Education Faculty Attitudes Toward Instructional Technology and Their Extent of Utilization of that Technology

Project Director: Jennifer Austin

Department: Counseling and Higher Education

Advisor: Robert Young

Rebecca Cale, Associate Director, Research Compliance Institutional Review Board

11/25/03 Date
Appendix B

Initial E-mail Correspondence Sent to Potential Participants
Dear Athletic Training Educator,

We are asking you to assist us by participating in an on-line questionnaire entitled *Attitudes Toward and Extent of Utilization of Instructional Technology in Athletic Training Education Programs*. The questionnaire is part of a research project that will culminate in my Doctoral dissertation. This e-mail along with a link to the questionnaire is being sent to certified athletic trainers instructing in CAAHEP accredited entry-level athletic training education programs. The survey is designed to gather information regarding attitudes about the use of instructional technology. Additionally the survey will gather information regarding the extent of utilization of instructional technology in teaching athletic training courses.

We ask that you please take a moment to click the active link (either here or at the end of this letter) that will direct you to the on-line survey. The survey works most efficiently using Internet Explorer as the browser. A lot of times it does not read well in Netscape. If you are not teaching or have not taught an athletic training course this academic year please still proceed to the survey and complete "Section 1: Demographic Information" and submit that information. If you teach at least one athletic training course please follow the directions for each section of the survey and complete the entire survey. When you are finished click on the “submit” button at the end of the survey.

Data from this survey is being collected for research purposes through Ohio University where the Institutional Review Board has granted approval for the study. Your participation in this research project is completely voluntary, and you may discontinue participation at any point. Completion and submission of the survey will signify your consent to participate. All information will remain confidential through the use of aggregated data. If you are interested we will provide you with a summary of the results. You can indicate your interest by checking the space provided at the end of the survey. Please note we are requesting your e-mail address with the survey for non-research purposes only, to prevent reminder e-mails being sent to responders, and to provide a summary of results for individuals who request them. Your e-mail address will not be utilized for research purposes, and it will be kept completely separate from data collected.

If you have any questions or concerns regarding this research project, you can reply to this e-mail or contact me by phone at (585) 624-8328.

I realize your time is valuable and your assistance in the effort of completing this research is greatly appreciated. The entire survey should take approximately 12 minutes to complete. The survey can be found at:

http://home.sjfc.edu/assessment/attitudes/survey.htm

Thank you for your time and assistance.

Sincerely,

Dr. Robert Young    Ms. Jennifer Austin
(Dissertation Chair)   (Project Coordinator)
Appendix C

Pilot Study Cover Letter
November 10, 2003

Dear Colleague,

I am asking your assistance in completing the enclosed survey as part of a pilot study. The survey is designed to gather information regarding attitudes towards the use of instructional technology. Additionally, the survey will gather information regarding the extent of utilization of instructional technology.

This research is being completed as a precursor to gathering data from athletic training educators. I ask that you please take a moment to complete and return the enclosed survey. I realize your time is valuable and your assistance in the effort of completing this research is appreciated. The survey should take approximately 10 minutes to complete.

Data from this survey is being collected for research purposes through Ohio University. Your participation in this research project is completely voluntary, and you may discontinue participation at any point. Completion and return of the survey will signify your consent to participate. All information will remain confidential through the use of aggregated data.

Thank you for your time,

Jennifer Austin
Appendix D

Pilot Study Survey Instrument
Section 1: Demographic Information

1. What is your gender?  
   ___ Male  ___ Female

2. What is your highest level of education obtained?  
   ___ Bachelor's Degree  ___ Master's Degree  
   ___ Doctorate Degree  ___ Other, please specify ____________________

3. Which rank do you hold at your current position?  
   ___ Graduate Assistant  ___ Instructor  
   ___ Assistant Professor  ___ Associate Professor  
   ___ Full Professor  ___ Other, please specify ____________________

4. How old are you? __________

Section 2: Attitude Towards Instructional Technology

For each of the following items, I would like you to indicate the extent of your agreement or disagreement with the statement concerning your attitude towards the use of instructional technology. Please circle one choice per statement.

1. Instructional technology plays a useful role in education.  
   Strongly Agree  Agree  Neutral  Disagree  Strongly Disagree

2. Incorporating instructional technology into teaching increases productivity.  
   Strongly Agree  Agree  Neutral  Disagree  Strongly Disagree

3. I feel it is not important to integrate technology into the educational setting.  
   Strongly Agree  Agree  Neutral  Disagree  Strongly Disagree

4. Incorporating instructional technology helps decrease barriers between the classroom setting and "real world" situations.  
   Strongly Agree  Agree  Neutral  Disagree  Strongly Disagree

5. Students are becoming discouraged by the increased utilization of instructional technologies.  
   Strongly Agree  Agree  Neutral  Disagree  Strongly Disagree

6. Incorporating instructional technology techniques is difficult.  
   Strongly Agree  Agree  Neutral  Disagree  Strongly Disagree

7. Utilizing instructional technology helps students go from simply covering information to mastering information.  
   Strongly Agree  Agree  Neutral  Disagree  Strongly Disagree

8. There is not enough recognition for implementing instructional technology techniques.  
   Strongly Agree  Agree  Neutral  Disagree  Strongly Disagree
9. Incorporating instructional technology is time consuming.
   Strongly Agree  Agree  Neutral  Disagree  Strongly Disagree

10. Implementing technology into clinical instruction is important.
    Strongly Agree  Agree  Neutral  Disagree  Strongly Disagree

11. Instructional technology techniques de-personalize the educational experience.
    Strongly Agree  Agree  Neutral  Disagree  Strongly Disagree

12. The integration of technology into instruction enhances student learning.
    Strongly Agree  Agree  Neutral  Disagree  Strongly Disagree

13. Instructional technology allows for more flexibility in teaching.
    Strongly Agree  Agree  Neutral  Disagree  Strongly Disagree

14. Students often become overwhelmed when instructional technology is used in the classroom.
    Strongly Agree  Agree  Neutral  Disagree  Strongly Disagree

15. Incorporating instructional technology techniques has a negative impact on the instruction of courses.
    Strongly Agree  Agree  Neutral  Disagree  Strongly Disagree

16. Utilizing instructional technology helps students move from passive reception of information to active engagement of knowledge.
    Strongly Agree  Agree  Neutral  Disagree  Strongly Disagree

17. Utilizing instructional technology in the clinical setting enhances student learning.
    Strongly Agree  Agree  Neutral  Disagree  Strongly Disagree

18. Having institutional support for implementing instructional technology is important.
    Strongly Agree  Agree  Neutral  Disagree  Strongly Disagree

19. Instructional technology helps create a more student-centered learning environment.
    Strongly Agree  Agree  Neutral  Disagree  Strongly Disagree

20. The use of instructional technology decreases communication between instructors and students.
    Strongly Agree  Agree  Neutral  Disagree  Strongly Disagree

21. Students obtain more information from a class that incorporates instructional technology techniques as compared to a class where instructional technology is not utilized.
    Strongly Agree  Agree  Neutral  Disagree  Strongly Disagree

22. The use of instructional technology enriches the content of courses.
    Strongly Agree  Agree  Neutral  Disagree  Strongly Disagree

23. Incorporating instructional technology techniques allows the instructor to utilize strategies that take into account students’ varied learning styles.
    Strongly Agree  Agree  Neutral  Disagree  Strongly Disagree
24. Students are distracted within the classroom setting when instructional technology techniques are utilized.

<table>
<thead>
<tr>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
</table>

25. Overall, please indicate your willingness to use instructional technology within athletic training education programs.

__________________________________________________________________________________
__________________________________________________________________________________
__________________________________________________________________________________
__________________________________________________________________________________

**Section 3: Instructional Technology Use**

Please indicate, by checking the most appropriate answer, the extent to which you utilize each of the following instructional technologies for all phases of instructional activities, including pre-class preparation, during-class instruction and activities, and out-of-class instructional activities, for the courses you teach.

1. Chalkboard or Whiteboard
   - Never Use
   - Experimented With
   - Use Occasionally
   - Use Regularly

2. Slide Projector
   - Never Use
   - Experimented With
   - Use Occasionally
   - Use Regularly

3. Overhead Projector
   - Never Use
   - Experimented With
   - Use Occasionally
   - Use Regularly

4. Video Cassette Recorder (VCR)
   - Never Use
   - Experimented With
   - Use Occasionally
   - Use Regularly

5. Video Camera or Camcorder
   - Never Use
   - Experimented With
   - Use Occasionally
   - Use Regularly

6. Video Desktop Projection System
   - Never Use
   - Experimented With
   - Use Occasionally
   - Use Regularly

7. Video Lightstand Projection Unit
   - Never Use
   - Experimented With
   - Use Occasionally
   - Use Regularly

8. Scanner
   - Never Use
   - Experimented With
   - Use Occasionally
   - Use Regularly

9. Electronic Tablet
   - Never Use
   - Experimented With
   - Use Occasionally
   - Use Regularly

10. Graphic Tablet
    - Never Use
    - Experimented With
    - Use Occasionally
    - Use Regularly

11. Commercial CD-ROM's
    - Never Use
    - Experimented With
    - Use Occasionally
    - Use Regularly

12. Self-Made CD-ROM's
    - Never Use
    - Experimented With
    - Use Occasionally
    - Use Regularly
<table>
<thead>
<tr>
<th>Number</th>
<th>Technology</th>
<th>Never Use</th>
<th>Experimented With</th>
<th>Use Occasionally</th>
<th>Use Regularly</th>
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<tr>
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<td>Personal Desktop Computer</td>
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<tr>
<td></td>
<td></td>
<td>Never Use</td>
<td>Experimented With</td>
<td>Use Occasionally</td>
<td>Use Regularly</td>
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<td>14</td>
<td>Laptop Computer</td>
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<td></td>
<td>Never Use</td>
<td>Experimented With</td>
<td>Use Occasionally</td>
<td>Use Regularly</td>
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<td>15</td>
<td>Digital Still Camera</td>
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<td></td>
<td></td>
<td>Never Use</td>
<td>Experimented With</td>
<td>Use Occasionally</td>
<td>Use Regularly</td>
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<tr>
<td>16</td>
<td>Interactive Video</td>
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<td></td>
<td></td>
<td>Never Use</td>
<td>Experimented With</td>
<td>Use Occasionally</td>
<td>Use Regularly</td>
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<td>17</td>
<td>Electronic Mail (E-mail)</td>
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<tr>
<td></td>
<td></td>
<td>Never Use</td>
<td>Experimented With</td>
<td>Use Occasionally</td>
<td>Use Regularly</td>
</tr>
<tr>
<td>18</td>
<td>Internet Browser</td>
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<td></td>
<td></td>
<td>Never Use</td>
<td>Experimented With</td>
<td>Use Occasionally</td>
<td>Use Regularly</td>
</tr>
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<td>19</td>
<td>On-line Bulletin Boards</td>
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<td></td>
<td></td>
<td>Never Use</td>
<td>Experimented With</td>
<td>Use Occasionally</td>
<td>Use Regularly</td>
</tr>
<tr>
<td>20</td>
<td>Listserv or Discussion List</td>
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<tr>
<td></td>
<td></td>
<td>Never Use</td>
<td>Experimented With</td>
<td>Use Occasionally</td>
<td>Use Regularly</td>
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<td>21</td>
<td>On-line Conferences</td>
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<td></td>
<td>Never Use</td>
<td>Experimented With</td>
<td>Use Occasionally</td>
<td>Use Regularly</td>
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<td>22</td>
<td>On-line Databases</td>
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<td></td>
<td>Never Use</td>
<td>Experimented With</td>
<td>Use Occasionally</td>
<td>Use Regularly</td>
</tr>
<tr>
<td>23</td>
<td>Websites Produced by Others</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>Never Use</td>
<td>Experimented With</td>
<td>Use Occasionally</td>
<td>Use Regularly</td>
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<tr>
<td>24</td>
<td>Websites Self-Produced</td>
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<tr>
<td></td>
<td></td>
<td>Never Use</td>
<td>Experimented With</td>
<td>Use Occasionally</td>
<td>Use Regularly</td>
</tr>
<tr>
<td>25</td>
<td>Network-Based Courseware Development Tools (i.e. WebCT, TopClass)</td>
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</tr>
<tr>
<td></td>
<td></td>
<td>Never Use</td>
<td>Experimented With</td>
<td>Use Occasionally</td>
<td>Use Regularly</td>
</tr>
<tr>
<td>26</td>
<td>Word Processing (i.e. Word, WordPerfect)</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>Never Use</td>
<td>Experimented With</td>
<td>Use Occasionally</td>
<td>Use Regularly</td>
</tr>
<tr>
<td>27</td>
<td>Spreadsheet Programs (i.e. Excel, Lotus 1,2,3)</td>
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<tr>
<td></td>
<td></td>
<td>Never Use</td>
<td>Experimented With</td>
<td>Use Occasionally</td>
<td>Use Regularly</td>
</tr>
<tr>
<td>28</td>
<td>Statistical Programs (i.e. SPSS, SAS)</td>
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<tr>
<td></td>
<td></td>
<td>Never Use</td>
<td>Experimented With</td>
<td>Use Occasionally</td>
<td>Use Regularly</td>
</tr>
<tr>
<td>29</td>
<td>Database Programs (i.e. FileMaker, PC File)</td>
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<tr>
<td></td>
<td></td>
<td>Never Use</td>
<td>Experimented With</td>
<td>Use Occasionally</td>
<td>Use Regularly</td>
</tr>
<tr>
<td>30</td>
<td>Desktop Publishing (i.e. PageMaker, Quark)</td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td></td>
<td></td>
<td>Never Use</td>
<td>Experimented With</td>
<td>Use Occasionally</td>
<td>Use Regularly</td>
</tr>
</tbody>
</table>
31. Electronic Publishing (i.e. Adobe Acrobat Reader or Adobe Exchange)
   Never Use       Experimented With       Use Occasionally      Use Regularly

32. Web Publishing (HTML) (i.e. HomePage, FrontPage)
   Never Use       Experimented With       Use Occasionally      Use Regularly

33. Paint/Draw Programs (i.e. PhotoShop, CorelDraw)
   Never Use       Experimented With       Use Occasionally      Use Regularly

34. Presentation Software (i.e. PowerPoint, Persuasion)
   Never Use       Experimented With       Use Occasionally      Use Regularly

35. Multimedia
   Never Use       Experimented With       Use Occasionally      Use Regularly

36. Multimedia Authoring (i.e. Authorware, ToolBook)
   Never Use       Experimented With       Use Occasionally      Use Regularly

37. CD Authoring (i.e. Toast, EZ CD Writer)
   Never Use       Experimented With       Use Occasionally      Use Regularly

38. Video Authoring (i.e. Premiere, VideoShop)
   Never Use       Experimented With       Use Occasionally      Use Regularly

39. Instructional Management Systems
   Never Use       Experimented With       Use Occasionally      Use Regularly

40. Hypermedia
   Never Use       Experimented With       Use Occasionally      Use Regularly

41. Integrated Learning Systems
   Never Use       Experimented With       Use Occasionally      Use Regularly

Section 4: Please answer the following questions to help create the most appropriate survey questionnaire.

1. Are there any items throughout the survey that need further clarification?
   _____ No  _____ Yes, please indicate which items

2. Do you feel there are items that should be deleted from the survey?
   _____ No  _____ Yes, please indicate which items

3. Do you feel there are items or topics that should be added to the survey?
   _____ No  _____ Yes, please indicate which items

4. Approximately how long did it take you to complete this survey? _______________
Thank you for taking the time to complete this survey. Your assistance is an important part of this research project and it is appreciated.
Appendix E

Attitudes Toward and Extent of Utilization of Instructional Technology in Athletic Training Education Programs Survey
**Attitudes Toward and Extent of Utilization of Instructional Technology in Athletic Training Education Programs Survey**

**Instructional Technology:**
For the purpose of this study the term instructional technology will refer to the use of technology to achieve an instructional objective. Consider instructional technology as being made up of devices and materials that are used in the processes of teaching and learning (Spotts & Bowman, 1995)

What is your e-mail address? ______________________________

(E-mail will only be used to prevent reminder e-mails from being sent and to provide summary information to participants who indicate they would like survey results. Responses will be separated from e-mail addresses immediately.)

**Section 1: Demographic Information**

5. What is your gender? _____Male _____Female

6. What is your highest level of education obtained?
   _____Bachelor's Degree  _____Master's Degree
   _____Doctorate Degree  _____Other, please specify
   ______________________

7. Which rank do you hold at your current position?
   _____Graduate Assistant  _____Instructor
   _____Assistant Professor  _____Associate Professor
   _____Full Professor  _____Other, please specify
   ______________________

8. How old are you? ________

9. During this academic year (2003-2004) are you teaching or have you taught at least one course directly related to athletic training education?
   _____ Yes, please continue and complete Sections 2 & 3.
   _____ No, please proceed to the end of the survey.
Section 2: Attitude Towards Instructional Technology

For each of the following items, I would like you to indicate the extent of your agreement or disagreement with the statement concerning your attitude towards the use of instructional technology in athletic training education programs. Please circle one choice per statement.

1. Instructional technology plays a useful role in athletic training education.
   - Strongly Agree
   - Agree
   - Neutral
   - Disagree
   - Strongly Disagree

2. Incorporating instructional technology into teaching increases productivity.
   - Strongly Agree
   - Agree
   - Neutral
   - Disagree
   - Strongly Disagree

3. I feel it is not important to integrate technology into the educational setting.
   - Strongly Agree
   - Agree
   - Neutral
   - Disagree
   - Strongly Disagree

4. Incorporating instructional technology helps decrease barriers between the classroom setting and “real world” situations.
   - Strongly Agree
   - Agree
   - Neutral
   - Disagree
   - Strongly Disagree

5. Students are becoming discouraged by the increased utilization of instructional technologies.
   - Strongly Agree
   - Agree
   - Neutral
   - Disagree
   - Strongly Disagree

6. Incorporating instructional technology techniques is difficult.
   - Strongly Agree
   - Agree
   - Neutral
   - Disagree
   - Strongly Disagree

7. Utilizing instructional technology helps students go from simply covering information to mastering information.
   - Strongly Agree
   - Agree
   - Neutral
   - Disagree
   - Strongly Disagree

8. Implementing technology into clinical instruction is important.
   - Strongly Agree
   - Agree
   - Neutral
   - Disagree
   - Strongly Disagree

9. Instructional technology techniques de-personalize the educational experience.
   - Strongly Agree
   - Agree
   - Neutral
   - Disagree
   - Strongly Disagree

10. The integration of technology into instruction enhances student learning.
    - Strongly Agree
    - Agree
    - Neutral
    - Disagree
    - Strongly Disagree

11. Instructional technology allows for more flexibility in teaching.
    - Strongly Agree
    - Agree
    - Neutral
    - Disagree
    - Strongly Disagree

12. Students often become overwhelmed when instructional technology is used in the classroom.
    - Strongly Agree
    - Agree
    - Neutral
    - Disagree
    - Strongly Disagree

13. Incorporating instructional technology techniques has a negative impact on the instruction of athletic training education courses.
    - Strongly Agree
    - Agree
    - Neutral
    - Disagree
    - Strongly Disagree
14. Utilizing instructional technology helps students move from passive reception of information to active engagement of knowledge.

<table>
<thead>
<tr>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
</table>

15. Utilizing instructional technology in the clinical setting enhances student learning.

<table>
<thead>
<tr>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
</table>

16. Having institutional support for implementing instructional technology is important.

<table>
<thead>
<tr>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
</table>

17. Instructional technology helps create a more student-centered learning environment.

<table>
<thead>
<tr>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
</table>

18. The use of instructional technology decreases communication between instructors and students.

<table>
<thead>
<tr>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
</table>

19. Students obtain more information from a class that incorporates instructional technology techniques as compared to a class where instructional technology is not utilized.

<table>
<thead>
<tr>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
</table>

20. Instructional technology enriches the content of courses.

<table>
<thead>
<tr>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
</table>

21. Incorporating instructional technology techniques allows the instructor to utilize strategies that take into account students’ varied learning styles.

<table>
<thead>
<tr>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
</table>

22. Students are distracted within the classroom setting when instructional technology techniques are utilized.

<table>
<thead>
<tr>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
</table>

23. Incorporating instructional technology techniques is too time consuming.

<table>
<thead>
<tr>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
</table>

24. Overall, please indicate your willingness to use instructional technology within athletic training education programs.

_______________________________________________________________________________
_______________________________________________________________________________
_______________________________________________________________________________
_______________________________________________________________________________

Section 3: Instructional Technology Use

Please indicate, by checking the most appropriate answer, the extent to which you utilize each of the following instructional technologies for all phases of instructional activities, including pre-class preparation, during-class instruction and activities, and out-of-class instructional activities, for athletic training courses you teach.
1. Chalkboard or Whiteboard
   Never Use Experimented With Use Occasionally Use Regularly
2. Slide Projector
   Never Use Experimented With Use Occasionally Use Regularly
3. Overhead Projector
   Never Use Experimented With Use Occasionally Use Regularly
4. Video Cassette Recorder (VCR)
   Never Use Experimented With Use Occasionally Use Regularly
5. Video Camera or Camcorder
   Never Use Experimented With Use Occasionally Use Regularly
6. Video Projection System
   Never Use Experimented With Use Occasionally Use Regularly
7. Scanner
   Never Use Experimented With Use Occasionally Use Regularly
8. Electronic Tablet
   Never Use Experimented With Use Occasionally Use Regularly
9. Graphic Tablet
   Never Use Experimented With Use Occasionally Use Regularly
10. Commercial CD-ROM’s
    Never Use Experimented With Use Occasionally Use Regularly
11. Self-Made CD-ROM’s
    Never Use Experimented With Use Occasionally Use Regularly
12. Computer Testing
    Never Use Experimented With Use Occasionally Use Regularly
13. Computer Simulations
    Never Use Experimented With Use Occasionally Use Regularly
14. Personal Desktop Computer
    Never Use Experimented With Use Occasionally Use Regularly
15. Laptop Computer
    Never Use Experimented With Use Occasionally Use Regularly
16. Digital Still Camera
    Never Use Experimented With Use Occasionally Use Regularly
17. Interactive Video
    Never Use Experimented With Use Occasionally Use Regularly
18. Electronic Mail (E-mail)
    Never Use Experimented With Use Occasionally Use Regularly
<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>19. Internet Browser</td>
<td><strong>Never Use</strong></td>
<td><strong>Experimented With</strong></td>
<td>Use Occasionally</td>
<td>Use Regularly</td>
</tr>
<tr>
<td>20. On-line Bulletin Boards</td>
<td><strong>Never Use</strong></td>
<td><strong>Experimented With</strong></td>
<td>Use Occasionally</td>
<td>Use Regularly</td>
</tr>
<tr>
<td>21. Listserv or Discussion List</td>
<td><strong>Never Use</strong></td>
<td><strong>Experimented With</strong></td>
<td>Use Occasionally</td>
<td>Use Regularly</td>
</tr>
<tr>
<td>22. On-line Conferences</td>
<td><strong>Never Use</strong></td>
<td><strong>Experimented With</strong></td>
<td>Use Occasionally</td>
<td>Use Regularly</td>
</tr>
<tr>
<td>23. On-line Databases</td>
<td><strong>Never Use</strong></td>
<td><strong>Experimented With</strong></td>
<td>Use Occasionally</td>
<td>Use Regularly</td>
</tr>
<tr>
<td>24. Websites Produced by Others</td>
<td><strong>Never Use</strong></td>
<td><strong>Experimented With</strong></td>
<td>Use Occasionally</td>
<td>Use Regularly</td>
</tr>
<tr>
<td>25. Websites Self-Produced</td>
<td><strong>Never Use</strong></td>
<td><strong>Experimented With</strong></td>
<td>Use Occasionally</td>
<td>Use Regularly</td>
</tr>
<tr>
<td>26. Network-Based Courseware Development Tools (i.e. WebCT, TopClass)</td>
<td><strong>Never Use</strong></td>
<td><strong>Experimented With</strong></td>
<td>Use Occasionally</td>
<td>Use Regularly</td>
</tr>
<tr>
<td>27. Word Processing (i.e. Word, WordPerfect)</td>
<td><strong>Never Use</strong></td>
<td><strong>Experimented With</strong></td>
<td>Use Occasionally</td>
<td>Use Regularly</td>
</tr>
<tr>
<td>28. Spreadsheet Programs (i.e. Excel, Lotus 1,2,3)</td>
<td><strong>Never Use</strong></td>
<td><strong>Experimented With</strong></td>
<td>Use Occasionally</td>
<td>Use Regularly</td>
</tr>
<tr>
<td>29. Statistical Programs (i.e. SPSS, SAS)</td>
<td><strong>Never Use</strong></td>
<td><strong>Experimented With</strong></td>
<td>Use Occasionally</td>
<td>Use Regularly</td>
</tr>
<tr>
<td>30. Database Programs (i.e. FileMaker, PC File)</td>
<td><strong>Never Use</strong></td>
<td><strong>Experimented With</strong></td>
<td>Use Occasionally</td>
<td>Use Regularly</td>
</tr>
<tr>
<td>31. Desktop Publishing (i.e. PageMaker, Quark)</td>
<td><strong>Never Use</strong></td>
<td><strong>Experimented With</strong></td>
<td>Use Occasionally</td>
<td>Use Regularly</td>
</tr>
<tr>
<td>32. Electronic Publishing (i.e. Adobe Acrobat Reader or Adobe Exchange)</td>
<td><strong>Never Use</strong></td>
<td><strong>Experimented With</strong></td>
<td>Use Occasionally</td>
<td>Use Regularly</td>
</tr>
<tr>
<td>33. Web Publishing (HTML) (i.e. HomePage, FrontPage)</td>
<td><strong>Never Use</strong></td>
<td><strong>Experimented With</strong></td>
<td>Use Occasionally</td>
<td>Use Regularly</td>
</tr>
<tr>
<td>34. Paint/Draw Programs (i.e. PhotoShop, CorelDraw)</td>
<td><strong>Never Use</strong></td>
<td><strong>Experimented With</strong></td>
<td>Use Occasionally</td>
<td>Use Regularly</td>
</tr>
<tr>
<td>35. Presentation Software (i.e. PowerPoint, Persuasion)</td>
<td><strong>Never Use</strong></td>
<td><strong>Experimented With</strong></td>
<td>Use Occasionally</td>
<td>Use Regularly</td>
</tr>
<tr>
<td>36. Multimedia</td>
<td><strong>Never Use</strong></td>
<td><strong>Experimented With</strong></td>
<td>Use Occasionally</td>
<td>Use Regularly</td>
</tr>
</tbody>
</table>
37. Instructional Management Systems

Never Use       Experimented With       Use Occasionally      Use Regularly

38. Hypermedia

Never Use       Experimented With       Use Occasionally      Use Regularly

39. Integrated Learning Systems

Never Use       Experimented With       Use Occasionally      Use Regularly

Thank you for taking the time to complete this survey. Your assistance is an important part of this research project and it is appreciated. If you would like results of the survey once they become available please check here. _________
Appendix F

Second E-mail Correspondence Sent to Potential Participants
Dear Athletic Training Educator,

Recently you were asked to assist us by participating in an on-line questionnaire entitled *Attitudes Toward and Extent of Utilization of Instructional Technology in Athletic Training Education Programs*. If you have already completed the survey and submitted your responses please disregard this message and we thank you for your time and valuable contribution to this study.

If you have not completed and submitted your responses for the survey we ask that you please reconsider your reason for not participating. We know your time is valuable, but completion of the survey will only take ten minutes and your contribution to this research project is important for its successful completion. Therefore, we are asking once again that you please take a moment to click the active link (either here or at the end of this letter) that will direct you to the on-line survey, then complete and submit your responses. The survey works most efficiently using Internet Explorer (either version 6.0 or version 5.5 sp2) as the browser. A lot of times it does not read well in Netscape Navigator, however some have found that Netscape version 6.2 works fine. Additionally we have discovered the survey may become distorted when viewed using a Macintosh computer.

The questionnaire is part of a research project that will culminate in my Doctoral dissertation. This e-mail along with a link to the questionnaire is being sent to certified athletic trainers instructing in CAAHEP accredited entry-level athletic training education programs. The survey is designed to gather information regarding attitudes about the use of instructional technology. Additionally the survey will gather information regarding the extent of utilization of instructional technology in teaching athletic training courses.

Data from this survey is being collected for research purposes through Ohio University where the Institutional Review Board has granted approval for the study. Your participation in this research project is completely voluntary, and you may discontinue participation at any point. Completion and submission of the survey will signify your consent to participate. All information will remain confidential through the use of aggregated data. If you are interested we will provide you with a summary of the results. You can indicate your interest by checking the space provided at the end of the survey. Please note we are requesting your e-mail address with the survey for non-research purposes only, to prevent reminder e-mails being sent to responders, and to provide a summary of results for individuals who request them. Your e-mail address will not be utilized for research purposes, and it will be kept completely separate from data collected.

If you have any questions or concerns regarding this research project, you can reply to this e-mail or contact me via phone at (585) 624-8328.

I realize your time is valuable and your assistance in the effort of completing this research is greatly appreciated. The entire survey should take approximately 12 minutes to complete. The survey can be found at:

http://home.sjfc.edu/assessment/attitudes/survey.htm

Thank you for your time and assistance.

Sincerely,

Dr. Robert Young
(Dissertation Chair)

Ms. Jennifer Austin
(Project Coordinator)
Appendix G

Third E-mail Correspondence Sent To Potential Participants
Dear Athletic Training Educator,

A few weeks ago you were asked to participate in an on-line research questionnaire entitled *Attitudes Toward and Extent of Utilization of Instructional Technology in Athletic Training Education Programs*. If you have already completed the survey and submitted your responses please disregard this message and we thank you for your time and valuable contribution to this study.

If you have not completed the questionnaire, please keep in mind your participation is crucial to our study. Even though you must be extremely busy at this time we are asking for your assistance. Our research will be more meaningful if we can include your response in our study. If you teach at least one athletic training course please take a moment to click the active link (either here or at the end of this letter) that will direct you to the on-line survey, then complete and submit your responses. The survey works most efficiently using Internet Explorer (either version 6.0 or version 5.5 sp2) as the browser. A lot of times it does not read well in Netscape Navigator, however some have found that Netscape version 6.2 works fine. Additionally we have discovered the survey may become distorted when viewed using a Macintosh computer.

Data from this survey is being collected for research purposes through Ohio University where the Institutional Review Board has granted approval for the study. This research is completely voluntary and you may discontinue participation at any point. Completion and return will signify your consent to participate. All information will remain confidential through the use of aggregated data. If you are interested we will provide you with a summary of the results.

The questionnaire can be found at [http://home.sjfc.edu/assessment/attitudes/survey.htm](http://home.sjfc.edu/assessment/attitudes/survey.htm)

If you have any questions or concerns regarding this research project you can reply to this e-mail. Thank you for your time and assistance.

Sincerely,

Dr. Robert Young  Ms. Jennifer Austin  
(Dissertation Chair)  (Project Coordinator)
Appendix H

Qualitative Data Regarding Willingness to Utilize Instructional Technology
Qualitative Data Regarding Willingness to Utilize Instructional Technology

1. Willing. (Repeated 3 additional times)
2. Very willing. (Repeated 24 additional times)
3. I am not only willing, I frequently use it.
4. I use instructional technology in all my athletic training courses.
5. Very willing and very dependent upon technology in the classroom.
6. I am very willing to engage instructional technology in AT education.
7. I utilize power point presentations as well as anatomical CD's in my classes.
8. I have implemented instructional technology into all courses that I have taught during the past 3 years. I feel that instructional technology is an exciting and powerful way to bring certain ideas to the students.
9. I always use instructional technology in the courses I teach. Students today have grown-up using the technology and are very familiar with it, and I believe students relate to it better. With good support and resources there is no excuse not to use instructional technology.
10. I am very willing, and use instructional technology in every AT class, almost every class meeting.
11. My willingness to use technology is very strong. I use it everyday because I work at a university where each student and faculty member is issued a laptop.
12. I am willing and have incorporated technology into all of my courses at some level.
13. I am very willing to try and incorporate instructional technology into some of my classes where it is appropriate and accessible.
14. I am willingly use technology in my classroom to aid the student in learning. Our college incorporates the use of blackboard which really gives the instructor freedom as well as the student.
15. I use all forms of technology available to me to best convey the information to the students.
16. Very willing to incorporate instructional technology into athletic training education.
17. I taught this fall using a Power Point as the basis for class notes and visuals and I think that the students got a lot out of the class.
18. Extremely willing, an absolute necessity.
19. I already use it extensively.
20. I use it!!

21. I use instructional technology all the time in my courses.

22. I do use instructional technology to enhance student learning and I enjoy it.

23. I do use it every class almost every day.

24. I believe there is a definite need for instructional technology within the athletic training curriculum.

25. I am very willing to try and implement technology in the classroom when ever applicable. We recently installed a "Smart Classroom."

26. I am very willing to use instructional technology within athletic training education programs.

27. I believe that today’s educational environment makes the use of instructional technology more important than ever before. I encourage it’s use in our ATE program and attempt to use it when appropriate.

28. I rely on instructional technology to bring the clinic setting into the classroom. While this is no substitute for hands on experience, it adds tremendously to the quality of the lectures.

29. I use PowerPoint presentations on a regular basis, just because of the attachments I can incorporate into the lecture. I utilize instructional technology on a regular basis.

30. I do use instructional technology in my courses (1) to keep students current with trends (2) to fulfill university requirements as an instructor.

31. I make use of a great deal of instructional technology in all of my classes. It can be very time consuming but I have found it to be extremely beneficial to my students so I do my best to incorporate it within all of my coursework.

32. I am willing to increase my usage each semester. The initial set up time is consuming, but once in place, takes very little time. Also I think that students comfort with technology is so high that they would welcome any technology into the classroom.

33. Provided that resources are available and pertinent, I am willing to use a fair amount of instructional technology aids to classroom teaching.

34. Very much so.

35. I am very willing to include instructional technology into ATEP. It helps to have an administrative assistant with the teaching preparation component. However, I mainly use this technology for power point presentations, and the CDs that come with some texts.

36. I welcome opportunities to utilize instructional technology in my courses.
37. I am very willing and have implemented instructional technology into my athletic training course.

38. I use it daily. (Repeated 2 additional times.)

39. I am very willing, we have just received our first power point projector, so as yet we have not really utilized technology techniques. However, we are all very excited about utilizing power point along with techniques already employed.

40. I use technology in all of my courses.

41. I have been an avid user of instructional technology in all my athletic training courses since 1996.

42. I wouldn't want to teach without it. In regards to below: I regularly use self-made DVDs not CD-ROMS.

43. I currently utilize instructional technology to supplement hands-on experiences and lecture.

44. Overall I am very willing to try new ideas, especially utilizing instructional technology, to bring a new spin on teaching and learning.

45. I strongly believe that the utilization of instructional technology increases the retention of information. We encouragement our instructors to incorporate this.

46. Very willing and currently do so right now.

47. I use instructional technology during a high percentage of my athletic training courses.

48. I believe instruction technology is very important in athletic training education programs. I use instructional technology whenever possible in my classes.

49. I am always willing to add to my bag of tricks as an educator. I currently use as much technology as I can while being careful not to affect the interpersonal aspects of instruction.

50. I currently incorporate instructional technology into my classes and am always looking for new materials to use.

51. I'm very interested in using instructional technology within athletic training education programs whenever possible. Overall, I look for new was of using technology in education.

52. I feel it is an important part of new age education.

53. I do use it.

54. I am currently employed at an IBM wireless laptop campus, every student has a laptop. I enjoy using technology in the classroom. I utilize instructional technology in every class I teach.
55. Typically, I am very willing to accommodate various styles through the use of instructional technology. I believe it is a two-edged sword. If it is used properly, and under the right learning conditions, I think it can enhance cognition.

56. I am of firm belief that omitting instructional technologies based on thoughts that they are "too difficult" or "time consuming" is dangerous.

57. I would be very willing and interested to incorporate instructional technology within each of my athletic training education classes!

58. Very willing to use it. We pride ourselves at this institution for pursuing advancements in instructional techniques and delivery. However, rampant use of technology, particularly in new ATEP curriculums is too recent to gauge any true outcomes.

59. I am very eager to increase my utilization of instructional technology. I want to see more use of instructional technology developed for student use, including PDA programs and interactive video instruction.

60. I have been willing to use instructional technology in my courses.

61. Very willing- anything that aids in student retention is welcomed.

62. I am very anxious to use technology that helps me communicate with students via e-mail or a web-site and allows them to receive quick feedback on exams/assignments, etc. (eg. WebCT).

63. I am usually willing to try most technologies in the classroom. I normally use many different types of teaching methods to keep students engaged.

64. I currently use instructional technology.

65. I use instructional technology in every lesson I teach. It takes a little longer when designing the first lesson but the updates and revisions are easier.

66. I have done the best I can to use technology to enhance my classroom presentations and their effectiveness.

67. I am willing to incorporate instructional technology into athletic training education programs.

68. I already incorporate instructional technology.

69. I am very willing to use instructional technology with in our ATEP Program. We very much have the institutional support and technology to utilize it extensively.

70. We utilize blackboard for the majority of ATEP coursework. Students are more prepared during the course of learning if they have been "required". We also utilize technologies such as DVD/CD programs that are available in the campus library.

71. I am willing. I would like more time and credit for the added work that implementing technology requires.
72. I use instructional technology in most of my courses.

73. Very willing; using WebCT, multimedia, and experimenting with palm technology.
Appendix I

Qualitative Data Regarding Moderate or Occasional Use of Instructional Technology
Qualitative Data Regarding Moderate or Occasional Use of Instructional Technology

1. I use it within the limits of my knowledge, support, and availability in my classes. I do not use it in a clinical setting.

2. I use it on occasion.

3. Moderately willing. It depends on the situation.

4. I am willing to use it in my classes when it is warranted, but I don’t go out of my way to use it.

5. I am very willing to use whatever method is most effective for student enhancement. I do use a variety of instructional methods but have found that in athletic training courses the student benefits more from practical, more traditional styles of instruction.

6. I am willing and occasionally utilize instructional technology already.

7. I prefer to use instructional technology on a limited basis so that I have more interaction with the students.

8. I am willing to incorporate instructional technology into AT education on a limited basis. I do feel that technology can be beneficial and will be increasingly used in the future. The benefits of using technology include showing videos, diagrams, etc.

9. I do use IT in some courses for the presentation of material or as adjunct material. In other courses I do not use any IT materials.

10. I am willing to use technology in my teaching. However, I do not incorporate very much technology into my teaching. The extent of my technology use is the occasional power point presentation. The use of CD ROM programs seems to be useful in education.

11. I am pretty willing and open to incorporating instructional technology.
Appendix J

Qualitative Data Regarding the Benefits of Using Instructional Technology
Qualitative Data Regarding the Benefits of Using Instructional Technology

1. I am very willing to incorporate instructional technology in most of my classes. It aids in my preparation and presentation of course material.

2. I am very willing to use any instructional technology as long as the students and I feel it adds to the overall experience of the situation. The more user friendly the instructional technology is then the more likely I am to utilize it.

3. I think it is important to expose our students to many types of technology including instructional technology, it also gives the instructor more classroom time, interesting applications for the students and I am very willing to use all types.

4. I enjoy the ability to use instructional technology like PowerPoint or Blackboard. It allows me to get information to the students efficiently while not overwhelming them in class with handouts. I think it keeps the class on-task through the use of PowerPoint.

5. I have incorporated instructional technology into my undergraduate and graduate courses. The use of PowerPoint delivery of lecture information can assist students in listening and thinking about the topic, rather than hurriedly writing notes.

6. I am very willing to utilize instructional technology. I have seen it increase comprehension and aid in communicating ideas and concepts that can be difficult otherwise.

7. I am very willing to use lots of forms of instructional technology - it is important to student learning, student retention, student’s application of theory, it adds variety, it enables the student to learn independently.

8. I am very willing to use instructional technology in my classroom when ever possible. It helps the student to see things a little differently.

9. I am willing to use instructional technology in nearly every course I teach as it can help enhance students ability to gather and comprehend information. Therefore, I believe instructional technology has a place in all athletic training programs.

10. I try to incorporate the use of blackboard, PowerPoint etc on a daily basis. It makes my lectures more dynamic and I think more interesting to listen to.

11. I think it can definitely enhance your teaching ability because it can often take the student from simply "copying" lecture notes to actually visualizing a concept or theory once it has been taught -- an instant "practical application" if you will.

12. I feel that instructional technology makes my job considerably easier. It gives me a vehicle to provide a much more broad range of information and experiences for the students.

13. I am very willing. I think it allows you to incorporate many more examples to clarify topics.
14. I am willing to use instructional technology. I feel that it helps the students in note taking and listening/reading to comprehend the subject.

15. I have increased my use of instructional technology because it allowed me to provide the students with printable information that I had not been able to customize for my classes.

16. Very willing to use instructional technology and currently do so. It is a nice learning tool for the students and a way to vary teaching methods. Also enhances the teacher’s ability to remain organized, easily update courses, and save courses for future use.

17. I have used instructional technology extensively over the past 8 years. In many cases I think it enhances the delivery of didactic material and student learning is enhanced.

18. I am very willing to incorporate instructional technology into an athletic training education program. The overall effectiveness of the class is enhanced if you can show the students what you are talking about either through a slide, picture, or anatomic.

19. I am willing to use instructional technology because it enhances the learning process.

20. I try to incorporate instructional technology in the ATEP whenever possible. It enhances the learning experience for the students. It also prepares them for the work setting.

21. I utilize instructional technology on a daily basis. It gives a visual image as well as giving students real life situations (e.g. a movie clip of an injury happening following a lecture of ankle sprains allows to student to visually see an injury happen.
Appendix K

Qualitative Data Regarding the Use of Instructional Technology in Clinical Education
**Qualitative Data Regarding the Use of Instructional Technology in Clinical Education**

1. Currently at our institution, many of us have converted our lectures to PowerPoint. We are using Blackboard. We utilize Adam Anatomy software and Impact Concussion software. We currently are developing a database to record clinical skills of our students.

2. I am utilizing the technology available at our institution extensively in the didactical instruction but on a very limited basis for clinical education. I would be willing to incorporate clinical ed. technology, however, if it were available to me.

3. I use technology in our education program. However, what I do not want to see is distance learning in athletic training because clinical hands-on experience cannot be replaced. The technology should enhance, not replace the clinical.

4. To create a truly effective presentation requires creativity, resources and extra time. I think it enhances my teaching, but I do not use it alone. I try to incorporate technology in all of my courses, even clinical courses.

5. I continually am looking for opportunities to integrate various forms of technology into my courses. From software programs designed at enhancing student cognitive functioning, to patient tracking information, to using technology in the clinical setting.

6. I currently use instructional technology in primarily all my courses; both didactic and clinical. While I feel instructional technology can be very beneficial to the student, I believe it has to be incorporated in a way that does engage the student.

7. I try to incorporate varies technologies within the courses that I teach. I would like to expand the use of technology during clinical experiences.
Appendix L

Qualitative Data Regarding Time Concerns with Implementing Instructional Technology
Qualitative Data Regarding Time Concerns with Implementing Instructional Technology

1. I use it on a daily basis and would like to use more when I get the time to integrate it.

2. I enjoy using instructional technology in my classroom setting, I have not been able to integrate into clinical setting. Also, incorporating them is time consuming in a situation where academic instruction is not the only responsibility of the person.

3. Will use as time permits in preparing materials, teaching is but a portion of the position I am in so do not use to the fullest extent possible as this is time prohibitive in my situation.

4. I'm willing to use instructional technology as it becomes available to me in my institution. Sometimes it can be a bit time consuming while I am in season with a team and I'm not able to incorporate it as much as I would like.

5. VERY WILLING to do so. Now I just need the time & assistance to make it happen.

6. I am willing to use instructional technology as a component of my teaching style and method of delivery. I find it time consuming to learn how to use various instructional technology techniques initially. I believe that in the long run it can save time.

7. I feel that using instructional technology has its place in providing information as well as integrating information with decision making. Unfortunately It is extremely time consuming to develop novel and unique teaching methods or to seek out other methods.

8. Willing but have a difficult time to find the time to create the presentation within a program to utilize it or upload info to online class web pages, etc.

9. I am very willing. It just comes down to time constraints most of the time.

10. Overall, I am willing to try new techniques that may provide avenues to students that may have a better experience, but I am concerned with the time commitment and accessibility of implementing such techniques.

11. Willing, but instructional recourse centers providing equipment is usually under staffed and not sufficient to support changing technology.

12. I do use IT some and would use it more if I took the time to get some training.

13. Willing, but time to create is a problem.

14. I am willing to use instructional technology with the ATEP, however, it is time consuming to get everything set up and to keep it updated.

15. Except for the time it takes to get it set-up or to utilize a different classroom, I'm willing to try it. In the Clinical Education course that I teach we use the training room for at least 50-75% of the time.
16. Based on available resources and material to be taught I believe instructional technology is viable and productive resource. Much time is needed when planning IT in a course. Weighing of time versus benefit is important.

17. Very willing but lack of preparation time sometimes limits what can be done.

18. I would like to incorporate more instructional technology into my athletic training courses but have been inhibited by the time it takes to initially organize the material and the lack of equipment in the classroom.

19. Very, willing to provide this service to my students. I find several issues at hand that seem to be a problem. I don’t personally have time to develop these technologies. Unless they are provided by the publisher it probably wont happen.

20. I am willing, and have incorporated some things in the past year. It is easy once you have it implemented, but developing the types of IT and getting them set up is time consuming.

21. I have a desire to implement more instructional technology into my classroom. Currently all of my course(s) utilize power point presentations, and lab/practical interactions. Time to implement more instructional technology is a limiting factor.

22. I am willing to, but have trouble finding the time to prepare with it, and use it as much as I would like.

23. I have found that utilizing instructional technology in the classroom has been very beneficial. I am very willing to use more however time is a factor in both planning and incorporating.

24. Willing, just do not have the time it takes to incorporate the technology - most other instructors have developed and implemented technology in their courses.

25. I am very willing to use it if I believe it will lend itself to enhancing student learning. While I don’t believe instructional technology use is “too time consuming” I believe that such things as monitoring online threaded discussions is more time consuming.
Appendix M

Qualitative Data Regarding Concerns with Institutional Support
Qualitative Data Regarding Concerns with Institutional Support

1. I am very willing to utilize IT in teaching and our educational program. However, lack of funding and support from our institution makes it difficult to do well & effectively.

2. Willing, but takes time and must have appropriate equipment and facilities (institutional support).

3. I would like to utilize instructional technology (PowerPoint, software programs, etc.) each day within the ATEP, however, my university does not have the equipment in the classrooms that the ATEP faculty and staff teach in to do so.

4. Very willing with appropriate IT support.

5. I do use technology when it can. It is hard if administration isn’t supportive financially, and it does take some extra time, however the benefits definitely outweigh the costs.

6. I thoroughly enjoy incorporating all types of instructional technology in the classroom and in the athletic training room. The biggest frustration for me as an educator is the availability of the equipment, software, etc.

7. I am will to use instructional technology, but I need more support from across campus. At this current time it takes extreme effort to get everything running in the classroom and training room.

8. I’m very willing but financial situations at my current institution are a barrier along with sometimes finding the time to learn the new technologies. Also a lot of the above questions depend on the instructor and their creativity when using technology.

9. It is very difficult to get support and resources for instructional technology. I am not sure that instructional technology helps the student transfer knowledge from the classroom to the clinical setting or in developing rapport with patients.

10. Willing, but instructional recourse centers providing equipment is usually under staffed and not sufficient to support changing technology.

11. I am very willing to utilize instructional technology within the ATEP if it is available (i.e., the university provides the financial resources to purchase this technology), if I receive the proper training to utilize this technology.

12. Very willing but limited by lack of institutional support.

13. I am very willing; financial constraints limit my complete use.

14. I use instructional technology to the best of my ability. I feel that it can be used to benefit the learning process, but I feel it can also be utilized in the wrong fashion. Availability of resources, training and support of the institution are keys.
15. I am always willing to try new things if there is administrative support and release time to learn applications of technologies. I would place it at a low priority especially when one reviews the CAAHEP competencies and everything else that needs to be done.

16. I am very willing to incorporate technology into the classroom. The limitations are only the funding allocated by the University.

17. I want to use IT in class. It is time consuming to prepare and sometimes expensive. There is lack of technical supp to prepare difficult material: transfer photos illustrations to presentations. Also a lot of break downs of equipment-computers, videos.

18. I currently use various audio-visual software products and devices in the classroom. I would like to incorporate more, but most often the prices are much too high.
Appendix N

Qualitative Data Regarding Concerns about Knowledge and Ability with Implementing Instructional Technology
Qualitative Data Regarding Concerns about Knowledge and Ability with Implementing Instructional Technology

1. I am very willing to incorporate instructional techniques into my classroom but have neither the knowledge nor the time to know how to do it efficiently and effectively.

2. I am willing, however I do not feel adequately trained in how to use multiple technological strategies or the strengths/weaknesses of different strategies (i.e. when one strategy might be more appropriate than another).

3. Very willing, but I am very confused and unsure of how to incorporate IT. I would like to know more.

4. I am willing but I don't know what is out there and some are difficult for me to use.

5. I am trying to incorporate IT into AT courses with varying success. I am willing, and still actively pursuing this avenue of teaching and learning.

6. Very willing - just not very skilled at it yet.
Appendix O

Qualitative Data Regarding use of Instructional Technology as one of Several Tools or Techniques
Qualitative Data Regarding use of Instructional Technology as one of Several Tools or Techniques

1. I am willing to use instructional technology to a point. Students become too dependent on the technology and expect everything to be spoon fed to them.

2. Instructional technology can be utilized within athletic training education programs to assist the teacher in the explanation of concepts. But it is not felt that instructional technology should be the only source of information.

3. I try to use current technologies when appropriate. I think using a variety of media/technology is helpful. I also believe that it is a quality instructor not the instructional technology that determines the quality of learning.

4. Willing on my own terms. Some use is appropriate and effective, however, like anything else it can be overdone and take the place of other, more meaningful experiences, and it “can” add time and complexity for the instructor.

5. I use technology in my classroom. It is like any other tool that can be used effectively or abused.

6. I have a great willingness to utilize instructional technology; however, I believe that it does not replace communication and interaction between the student and teacher, nor can it exist on its own without other strategies to be optimally effective.

7. I use IT often, however only as a supplement to other in-class activities. IT can create passivity in students just as a lecture can, so I only use IT to supplement instruction or as part of a case-study or problem-solving application.

8. I am willing to use technology…I do not wish it to become the focus of my academic presentation.

9. I would be willing to incorporate instructional technology as a supplement to the traditional teaching methods. I would not be willing to completely replace my teaching with this technology.

10. We use it willingly, but it can’t replace practical hands on practice and experience.

11. I am willing to use some forms of IT. However, substituting IT for hands on is hurting education.

12. I am all in favor of instructional technology IF the instructor uses it as a “tool” and not a “crutch” for disseminating information to the athletic training student.

13. Instructional technology is effective, yet I believe you need to teach to the variety of learning styles. I view instructional technology as another tool to help students, yet it will never be “the” most effective tool.

14. I think that it is very useful, but I don’t think that we should trade hands on personal teaching techniques for instructional technology.
15. I do use and strongly support the use of technology to AID in the educational process. By no means should it replace the imperative interaction that takes place between instructor and student.

16. I am very interested in instructional technologies and I am continually exploring avenues for incorporating these technologies into the classroom. However, I still look at the technology as a tool and not a replacement.
Appendix P

Qualitative Data Indicating Reluctance to Utilize Instructional Technology
Qualitative Data Indicating Reluctance to Utilize Instructional Technology

1. I believe in more hands on learning.
2. I am content with what I've already done.
3. I use very little and am not interested in putting so much stuff on power point.
Appendix Q

Qualitative Data Regarding Over-Reliance on and Excess use of Instructional Technology
Qualitative Data Regarding Over-Reliance on and Excess use of Instructional Technology

1. I am willing to use instructional technology to a point. Students become too dependent on the technology and expect everything to be spoon fed to them.

2. It has its place and value, but is not exclusive. Like all other instructional methods some students benefit while others are left behind. I welcome its use for some exclusive benefits, e.g. skin disorders, or heart/lung sounds.

3. I use instructional technology on a very regular basis in my classes. I find it to be effective most of the time, but sometimes I feel that it can be ineffective. Students get used to seeing power point presentations and audiovisual aids and they forget.

4. I would like to use more because I believe it supplements your material. I do not believe it should be used as the primary source of information dissemination. It can be a distraction to students sometimes.

5. I think that instructional technology has become a very useful tool when used correctly. I also feel it can be utilized, or relied upon too much and distracting. It is definitely a time consuming process that adds to overall course preparation.

6. I think it is an opportunity to enhance the environment; However, I see many instructors using technology to replace them as individuals in the classroom. This is one of my fears with more academic and less clinical.

7. I am willing to use technology however I am concerned that too much technology makes students lazy. Students often think that if it is not in the power point I do not have to know it. And if it is in the power point the teacher should send it to me.

8. It has its place, but it often does not allow flexibility in the classroom. Students can become dependent upon the information and often rely upon the technology medium for the information. It can be very time consuming for an assistant professor.

9. Instructional technology is good, but too many instructors rely on it and you lose the personal closeness of a student-teacher relation. Many students get bored looking at PowerPoint all day and therefore don't learn as much.

10. I feel it has it's place and can be helpful in providing a varied approach to teaching/learning styles. But over reliance on instructional technologies can cause students to become passive learners and to expect the instructor to "entertain" them.
Appendix R

Additional Qualitative Data Regarding Instructional Technology
Additional Qualitative Data Regarding Instructional Technology

1. I am an advocate for technology being used for instructional purposes. However, student motivation and effort greatly affects learning outcomes far more than whether the presentation was given in PowerPoint rather than an overhead projector.

2. I was very hesitant to use technology in my class because I didn’t know much about appropriate integration into my courses. This year I have made an effort to take workshops and get instruction on how to utilize technology in my classroom.

3. Today’s student tends to expect technology in the classroom, but I don’t think it helps with conveying concepts or retention of information.

4. I agree fully with using instructional technologies on an individual basis. I do not agree with it becoming proficiency or a mandate from the JRC. Certain instructors utilize technology well while others perform better with discussion.

5. I am willing and have used IT in classroom settings for the ATEP UG and grad programs. In using IT there have been some glitches to work out. Some are easier than others to fix. Some students love it, some hate it.

6. I am very willing, we have just received our first power point projector, so as yet we have not really utilized technology techniques. However, we are all very excited about utilizing power point along with techniques already employed.

7. The limiting factor is that instructional technology is not meant to replace the instructor. Without student - faculty interaction during the learning of a skill, errors with be practiced and learned.

8. Used properly, can enhance. Used poorly, detracts.

9. I like to use it however, I do notice that students check out during the time it is on the screen. I have noticed that students like to have it because it is neat but some feel it is too advanced for them... especially the anatomy tutorials

10. Willing to use it WHEN APPROPRIATE.

11. I do utilize instructional technology in the classroom for a variety of topics, but I do not feel it gives the material more of a boost in learning. My style is more practical and hands on approach. I utilize athletes that are injured within the learning environment.

12. I was very hesitant to use technology in my class because I didn’t know much about appropriate integration into my courses. This year I have made an effort to take workshops and get instruction on how to utilize technology in my classroom.

13. I am very willing and have used it extensively. I just don’t think it is necessarily that great.