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The CADET Training Program Versus the Student Certification Program: A Study of IT- Support Training Programs at Western Kentucky University

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THE CADET TRAINING PROGRAM VERSUS THE STUDENT CERTIFICATION
PROGRAM: A STUDY OF IT-SUPPORT TRAINING PROGRAMS AT WESTERN
KENTUCKY UNIVERSITY

A Thesis
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Master of Science

By
Michael Moore

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THE CADET TRAINING PROGRAM VERSUS THE STUDENT CERTIFICATION
PROGRAM: A STUDY OF IT-SUPPORT TRAINING PROGRAMS AT WESTERN
KENTUCKY UNIVERSITY

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I dedicate this project to my family. They have been supportive through the entire research. They will never know how much their love and inspiration means to me.

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PROGRAM: A STUDY OF IT-SUPPORT TRAINING PROGRAMS AT WESTERN
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Technology is a critical component of modern-day success. Advancements in technology have improved communication between individuals and companies. Technological advancements have allowed students to earn college degrees online. People who habitually use technology expect a high level of performance and support. As new technologies are implemented, such as complex web services or new operating systems, the dependence for information technology (IT) support grows in demand. Even learning curves can be cumbersome without proper assistance from IT professionals. Companies and institutions must accommodate user needs by implementing fast, efficient, and friendly support.

In order to offer optimal customer support, representatives must be knowledgeable of the products and services that are supported. At Western Kentucky University's (WKU) IT Helpdesk, a training program called Consultant Accelerated Development and Education in Technology (CADET) focuses on software, hardware, customer service, and procedures mandated by the IT Division. Prior to CADET, the Student Certification program was used to train student consultants. The Student Certification program was developed to satisfy training needs that allowed consultants to support end-user technical issues. CADET was developed in 2008 to replace the Student Certification program.

This study explored the question if CADET training is more effective in preparing consultants to do their jobs than the Student Certification program. The study investigated the effectiveness of CADET training compared to the Student Certification program by surveying IT Helpdesk student consultants. The survey results indicated which program was more adequate. Both programs contained the same training content, but training delivery methods differed. A t-test was used to compare both programs and determine the outcome of the study's hypotheses. The Student Certification program did not accommodate different learning styles. The teaching methods only included traditional classroom-style delivery. CADET training did accommodate different learning styles, delivering training through a wide variety of formats including video, audio, assessment, assignment, and face-to-face training. The research focused on the importance of addressing different learning behaviors.

The study suggested that CADET is more adequate in preparing students to do their job duties. When both Student Certification survey and the CADET survey were compared, CADET training is more adequate in 26 out of the 27 training sessions. The results suggested that learning style accommodation is directly related in the success in the CADET training program over the Student Certification program.

Introduction

WKU's IT Helpdesk is staffed with student consultants who are trained to support numerous online systems, software packages, hardware, and network devices. Student consultants face a variety of questions and challenges on a daily basis. Challenges included addressing end-user problems, developing troubleshooting practices, policy adherence, and optimizing customer service. To address these challenges, IT Helpdesk managers were required to develop a training program that built and strengthened student consultant IT-related skills. Skills include the ability to answer questions fast and efficiently, troubleshoot problems at the first level of contact, recall policies, and demonstrate good customer service skills.

In 2005, the Student Certification program was developed to address IT Helpdesk student consultant training. This program consisted of face-to-face sessions with Technical Support Services (TSS) staff members. Each staff member was assigned a specific IT-related topic to cover. These topics included internet connection troubleshooting, computer issues, online account management, and numerous other items. In 2008, management made a decision to audit the training program based on information retention problems. Students were not retaining training thus causing delays in customer support and additional work for staff members. IT Helpdesk staff members observed instances during live sessions where student consultants were unable to recall training information. It was believed student-learning behaviors were not taken into consideration when the Student Certification program was developed. Learning styles were taken in consideration when CADET training was developed. CADET program was

created to permanently replace the Student Certification program. The main focus of the CADET training program was to consolidate training to an online format and implement different training delivery methods to improve student retention issues by accommodating different learning styles.

Training and Research Structure

The CADET training program and Student Certification program were designed to cover IT-related functions. Training was divided into three main categories; Helpdesk-specific, TSS-specific, and IT division-specific. Student achieved milestones in training after the completion of each category. (a) The first milestone meant students were eligible to use all the office equipment and properly log support tickets after completion of Helpdesk-specific training. (b) Once students completed TSS-specific training, they were knowledgeable on how to address common problems or requests. (c) After completion of IT division-specific training, students were knowledgeable on how to support all other problems or requests in the IT division.

Student Certification Structure. The Student Certification program only involved face-to-face training sessions and documents delivered in a conference room. There were no additional training delivery methods used. Various IT staff members were responsible for developing training material. Trainers were responsible for reserving the conference rooms. IT Helpdesk staff members addressed IT Helpdesk-specific items such as answering the telephone, student workstation usage, phone etiquette, basic email troubleshooting, account policies, and password reset procedures. Other responsibilities included administering training for the remote connectivity software called GoToAssist. This software allowed support representatives to connect to end-user computers to

resolve issues over an internet connection. The IT Helpdesk used a custom-built internal database that housed common troubleshooting steps for resolving end-user problems. A staff member of the IT Helpdesk delivered this training. The IT Helpdesk had a standard operating procedure on how to handle each call. The procedure included identifying the end-user, documenting the issue or request, and escalating the support ticket. The training for this procedure was covered in a session called the Call Flow guide.

IT Helpdesk or Desktop Support consultants, depending on availability of the trainer, covered TSS-specific training. Desktop Support consultants' main responsibilities included troubleshooting computer and printer issues. These consultants typically were "hands on" with equipment rather than phone support. Active Directory and email setup was also covered in the TSS-specific training. Active Directory was a system that interconnected network devices. Interconnected devices are capable to share files, manage printing, and manage user accounts. Email setup training consisted of troubleshooting Microsoft Exchange accounts. Microsoft Exchange was the email system used at WKU. It also consisted of calendar functions and Global address book available to faculty and staff. Microsoft Exchange accounts were managed through the Microsoft Outlook program. Desktop Support provided Microsoft Outlook training.

IT Helpdesk staff members delivered IT division-specific training. This training included troubleshooting internet connection problems, web services issues, user account administration, and various other items. Network engineers developed training for troubleshooting internet issues, but IT Helpdesk staff was responsible for administering the content to the students. IT Helpdesk staff members trained students to support the network infrastructure, game console registrations, secure file transfer protocol (SFTP),

and answer general questions regarding internet connectivity. System administrators and web developers were responsible for developing training for various web services such as TopNet, MyWKU, and Banner. These systems house confidential and academic-related information for students, alumni, staff, and faculty. Academic Technology maintains departmental labs, Blackboard, and the Software center. Training for these systems was developed by a consultant from Academic Technology, but delivered by an IT Helpdesk staff member. Three brief sessions were conducted for each student consultant to summarize training and answer questions for each of the three main categories of training; IT Helpdesk specific, TSS-specific, and IT division-specific.

CADET Training Structure. CADET training and the Student Certification program contained the same training topics, but differed in delivery methods. CADET used face-to-face sessions as an alternative to the online format. The online format consisted of documentation, quizzes, audio, video, and assignment-based training delivery methods. Table 1 shows various methods of training delivered in CADET.

CADET training was a Blackboard organization. Blackboard was a learning management system (LMS) developed by Blackboard Inc. It was an enterprise-level software company based in Washington, D.C. The company was primarily known for Blackboard, the flagship LMS. WKU used Blackboard to deliver online course items to students. It allowed instructors and trainers to develop rich and elaborate online content for students. Instructors and trainers had the ability to post videos, images, assessments, discussion boards, documentation, graphical data, and various other educational materials. The wide variety of features offered through Blackboard accommodates different learning styles, which makes it an ideal solution to deliver training.

Table 1

Training Methods used in CADET

Training Session	FTF	Doc	Quiz	Audio	Video	Assign
Helpdesk Case Tracking Software	X	X	X	X	X	X
Phone Usage	X	X	X	X	X	
GoToAssist	X	X	X	X	X	X
Student Stations	X	X	X			
Etiquette	X	X	X	X	X	
E-Mail	X	X	X	X	X	X
Accounts, Policies, and Pass. Reset	X	X	X			
Help Desk Internal database	X	X	X			X
Call Flow Guide	X	X				
Overall Assessment 1			X			
Desktop Support Overview	X	X	X	X	X	
Active Directory	X	X	X			X
Exchange Tools	X	X	X			X
Printers	X	X	X			X
Overall Assessment 2			X			
Comm. Technologies Overview	X	X	X			X
Game Consoles	X	X	X	X	X	X
Internet Troubleshooting	X	X	X	X	X	X
Academic Technology Overview	X	X	X	X	X	
Software Center	X	X		X	X	X
Departmental Labs	X	X	X			
Administrative Systems and Applications	X	X	X			
Banner	X	X	X			
SFTP	X	X	X	X	X	X
MyWKU (Portal)	X	X	X	X	X	
TopNet	X	X	X			X
Overall Assessment 3			X			

Note: FTF = Face-to-face; Doc = Document; Assign = Assignment.

Students in CADET training were required to complete all training indicated in

Table 1. Setting adaptive releases in the comprehensive exam preferences at the end of

the IT Helpdesk-specific, TSS-specific, and IT division-specific training categories was

an automatic means of managing student training progression. Adaptive releases were

logical functions that trigger when specific conditions were met. Students were eligible to

access the comprehensive exams when conditions were satisfied. Documentation, video, and audio training items used the review status criterion. Review status was in the form of a button the student clicked upon reviewing the training material. Assessments and assignments required a passing grade condition to proceed. Adaptive release functions trigger when a passing grade was achieved. A failing grade did not suffice, so the trigger did not execute. Most assessments were automatically graded, so students received a grade upon completion. A few assessments required a trainer to manually grade the submission. All assessment used 10 questions worth one point each. Students were required to answer eight questions correctly. Face-to-face sessions were marked in the gradecenter with a checkmark by the trainer. The three comprehensive exams would be assessable when all conditions were met. If students failed to meet the conditions, they must address the same training until the condition was satisfied.

Summary of Differences. In the Student Certification program, training success and failures had not been a monitored task of IT Helpdesk management; so overall effectiveness was unknown. Students were required to complete training and report to work once finished, so comprehension of training materials was not evaluated. CADET training uses the gradecenter in Blackboard to gauge progression. Other differences between both programs included CADET training accommodating different learning styles by using different methods to deliver training. CADET used visual, auditory, and kinesthetic delivery methods consolidated to an online format. This format allowed students to progress through training at their own pace instead of being led by an instructor. The Student Certification program used face-to-face meetings with a handout that summarized the training. TSS staff members scheduled a time and date to meet with

student consultants. These meetings typically lasted 30 minutes to an hour. Once the consultant finished with the meeting, he or she was certified in that area of training.

Research Structure. This study acknowledged past research conducted by educators and learning behavior researchers. It accepted that students learned in different ways and optimal employee performance began with an understanding of the job responsibilities and supervisor expectations. The Student Certification and CADET programs were the only student training programs in the history of the IT Helpdesk. This study sought to verify CADET was a better program using data gathered from survey questionnaires administered to a pool of consultants who had completed the Student Certification program and another pool of students who had completed the CADET training. The survey questionnaires were developed to determine the adequacy in preparing students to perform their job duties. Survey participants were required to respond with strongly agree, agree, disagree, strongly disagree, or neutral to statements indicating training was adequate in getting them ready to perform their job duties. After data sets were gathered, statistical testing was used to determine if there was a difference between the CADET and the Student Certification programs and the significance of that difference.

Significance of the Research

The need for student consultants at WKU increased with the volume of IT-related issues since 2005. Students and faculty were starting to migrate to an online format of teaching and learning, which led the need for technical support. Switzer (2012) indicated WKU students were enrolled in 11,870 online credited hours in 2002. In 2009, the number of online credit hours significantly increased to 80,615. This increase was due to

technological advancements and thirteen consecutive years of enrollment growth.

According to Dale Brown, WKU interim associate vice president for enrollment

management, online classes offer students flexibility to address course work on their own

time, especially when the students have time restrictions that prevent them from going to

campus. There was a 7.4% increase in online classes from 2002 to 2009 (Switzer, 2012).

WKU's IT Helpdesk directly supported IT-related questions or problems. The

increase in online classes directly impacted the increase in volume for the IT Helpdesk.

The IT Helpdesk required functional knowledge of online systems, infrastructure,

software packages, account procedures, and protocols. To reach optimal performance

from employees, the IT Helpdesk required a training program that exposed students to

items that fell under the support umbrella. If students were improperly trained, managers

encounter subpar job performance, and client satisfaction may decline. Issues such as

delayed support, incorrect information, client aggravation, increased costs, and declined

organizational morale could have resulted from improper training.

Implementing the best training program would optimize consultant job

performance. Increased consultant performance, end-user satisfaction, quicker problem

resolution, and improved performance metrics would result from optimal training. This

research provided the IT Helpdesk with a successful means of deploying training to the

student consultants. This study supported the research conducted by Dr. Neil Fleming

(2001), Dr. Howard Gardner (2000), Dr. Benjamin Bloom (1984), and others. Research

conducted on learning behaviors suggested student learning is optimized when instructors

teach using different methods of delivery that accommodate different learning behaviors.

IT Helpdesk management sought to optimize employee performance by implementing the most effective training program. Effective training programs increase data retention and provide effective handling for higher call volume. This study established which training program was more adequate in preparing consultants to do their job duties indicating the superior training program.

Hypothesis

This research sought to (a) determine that CADET training was more effective than the Student Certification program in preparing IT Helpdesk consultants to perform their job duties. This study also determined (b) how significant the difference was between the Student Certification program and CADET. Effectiveness of training was based on the training programs, as a whole, instead of each category and session independently.

The null hypothesis stated there was not a difference between the Student Certification program and the CADET training program. This was represented with the hypothesis statement H_O: $\mu_a = \mu_b$. The alternative hypothesis stated the CADET training program was better than the Student Certification program. This was represented using the hypothesis statement H_a: $\mu_a < \mu_b$. The Student Certification program was identified as mu a (μ_a) and CADET was identified as mu b (μ_b). The study answered the following questions: "Is CADET training more effective than the Student Certification program?" If so, "How significant is the difference between CADET training and the Student Certification program?"

Assumptions

The following are assumptions identified in the study. (a) The Student Certification program only accommodated auditory learners. (b) CADET training accommodated multiple learning styles beyond auditory learners. (c) Students involved in the data collection used multiple learning styles. The basis of this training program relied on the fact that consultants learned in specific ways, using a unique combination of the learning styles. (d) It was assumed students could read and write at a college level. (e) After training, it was assumed each participant acknowledged and understood training to a degree. (f) It was assumed the training material within both programs were consistent regarding the content subject, troubleshooting steps, and procedures taken to resolve problems. (g) Each student consultant was assumed to have given full participation and effort so the effectiveness of training could be accurately defined.

Delimitations

The following are limitations identified in the study. (a) Each consultant was required to enter a training period and complete the survey within five weeks of starting training. (b) Training usually lasted three weeks to a month depending on how quickly the consultant completed training, but this may have varied depending on independent situations such as student availability and time to training completion. The researcher planned on meeting with students independently if they were unable to meet the month allotted time frame. This meeting was designed to pinpoint what was causing the student to fall behind on training. A plan of action would have been developed to address concerns if applicable. The plan, to ensure training would be completed within the allotted time, consisted of face-to-face sessions to answer questions about unclear

training. After completion of training, students were given one week to complete the survey. Email reminders were sent to students, daily, during the week they were allotted for the survey. (c) The training only applied to WKU-related systems. These systems included custom built applications, infrastructure, and services only applicable at WKU. Training and information that does not pertain to WKU-supported items were not included in the survey. (d) This program was targeted towards student consultants of the IT Helpdesk. Only students who were offered positions at the IT Helpdesk would have the opportunity to participate in training. Student consultants from other areas of Technical Support Services, such as Desktop Support and ResNet, did not participate in the research. The research required that the participants completed the Student Certification or CADET training programs. Desktop Support and ResNet students were not required to complete either training. The training those students received was not valid for this research. (e) The research consisted of twelve student consultants. Research was conducted in 2013 during the fall semester term. Data collection needed to take place during a period when all student positions were filled for accuracy purposes. (f) All training was developed in-house. Resources were available, free of charge, to build the training programs. There was not a need to invest in a vendor-provided training solution outside WKU.

This chapter explored past studies in the fields of training, education, and learning styles. The basis of the study was to determine if the CADET training program was more beneficial in preparing student consultants to perform their job duties over the Student Certification program. This study asserted training materials in the CADET program accommodated the different learning styles as defined by important figures in education such as Dr. Neil Fleming (2001) and Dr. Howard Gardner (2000). To understand the effectiveness of training, one must explore the origins of how students learn. What has proven to be effective, and which have failed? There are still many theories and research on learning behaviors today. This chapter examined the historical data that supports the significance of learning styles in education.

Early Research on Learning Styles

The learning style concept began in the early twentieth century. During the early stages, research focused on the relationship between memory and oral/visual methods of learning. A French psychologist, Alfred Binet, developed the first intelligence test that set in motion the interest to study different learning preferences, and behaviors, amongst students. In 1904, Dr. Binet was tasked to develop a test designed to identify which children in Paris schools needed remedial help with their studies. Dr. Binet eventually designed a questionnaire assessment that revolutionized testing today. In 1916, scholars at Stanford University refined Binet's test, which led to the Stanford-Binet test. Similar to Dr. Binet's initial assessment, the test was comprised of multiple answer questions that pinpointed areas of learning. The test's objective was to determine if students were gifted, average, or needed special attention regarding knowledge. The SAT, a

standardized test that most University's use today to determine student's readiness for college, was developed using Dr. Binet's early studies and is loosely based on the Stanford-Binet test (Ruf, 2003).

In 1907, Dr. Maria Montessori, an Italian physician and educator, invented the Montessori method. The Montessori method emphasized the importance of learning through practical play. Maria Montessori was a firm believer that students learn best when they are not given specific guidelines and are left to learn within their own guidelines. Lillard (2005), author of *Montessori: The Science Behind the Genius*, indicated that it is important that students are given the freedom to discover things on their own without any control from the parent or teacher. The Montessori method learning framework supports learning at the students' own pace and on their own terms without outside interference. Dr. Montessori spent most of her career studying children's actions and how students processed information if left to learn without specific constraints. She asserted people demonstrate knowledge of subjects better through practical application rather than answering multiple-choice questions. Both Binet and Montessori had radical ideas pertaining to student learning needs. Both were pioneers in the early stages of learning behavior studies and have solidified the need to address educational needs.

For several decades, learning style studies declined as IQ tests thrived in popularity. In the 1950s, learning style studies resumed in popularity with Benjamin Bloom's Taxonomy. Bloom's Taxonomy was a framework for organizing educational goals. Along with collaborators, Max Englehart, Edward Furst, Walter Hill, and David Krathwohl, Bloom's Taxonomy, also known as Taxonomy of Educational Objectives,

framework has been used by teachers in K-12 and higher education for generations.

Bloom (1984) said, "Use of taxonomy can also help one gain a perspective on the

emphasis given to certain behaviors by a particular set of educational plans" (p. 2).

Bloom suggested using the taxonomy model aids in understanding material. He also

suggested teachers can develop better curriculums based on student successes. Bloom's

research emphasized learning-style differences. The collaborators identified knowledge,

comprehension, application, analysis, synthesis, and evaluation as the main categories of

Bloom's Taxonomy. Knowledge involves the recall of specifics and universals, the recall

of methods and processes, or the recall of a pattern, structure, or setting. Comprehension

refers to a type of understanding such that the individual knows what is being

communicated and can make use of the material or idea without necessarily relating it to

other material or seeing its fullest implications. Application refers to the use of

abstractions in particular and concrete situations. Analysis represents the breakdown of a

communication into its constituent elements or parts such that the relative hierarchy of

ideas is made clear and/or the relations between ideas expressed are made explicit.

Synthesis involves the putting together of elements and parts so as to form a whole.

Evaluation refers to judgments about the value of material and methods for given

purposes (Bloom, 1984).

In the 1960s, American author, Isabel Briggs Myers and her mother Katharine

Cook Briggs developed a psychometric questionnaire designed to evaluate psychological

preferences in how people perceive the world and make decisions. This assessment was

known as the Myers-Briggs Type Indicator (MBTI). Myers and Briggs work was heavily

influenced by Carl Jung's typological theories. Further advancement was made in 1976

when Rita and Kenneth Dunn developed the Dunn and Dunn Model. The Dunn's defined learning styles as the way in which each learner begins to concentrate, process, and retain new and difficult information. That interaction occurs differently for everyone (Myers & Myers, 1995).

Dr. David A. Kolb, an American educational theorist, dedicated his time studying experiential learning. Kolb is most noted for developing the Kolb learning-style model. The Kolb learning style model was comprised of four stages: experiencing, reflecting, thinking, and acting. These stages happen in sequential order and could possibly repeat if the learner acts on information that can lead to experiencing. Kolb determined learning styles are closely related to cognitive skills. Kolb (1984) asserted:

> Each dimension of the learning process presents us with a choice. Since it is virtually impossible, for example, to simultaneously drive a car (Concrete Experience) and analyze a driver's manual about the car's functioning (Abstract Conceptualization), we resolve the conflict by choosing. Because of our hereditary equipment, our particular past life experiences, and the demands of our present environment, we develop a preferred way of choosing. We resolve the conflict between concrete or abstract and between active or reflective in some patterned, characteristic ways. We call these patterned ways learning styles. (p. 4)

New Zealand educator Dr. Neil Fleming and co-author Dr. Colleen Mills of Not *Another Inventory, Rather a Catalyst for Reflection* (1992) stated:

> Over the last four decades the literature from both psychology and education, has supported the proposition that learners of all ages have

different yet consistent ways of responding in learning situations. These

behaviors or predispositions to behave in a particular fashion have been

termed learning styles or cognitive styles. (p. 137)

Dr. Fleming developed the VARK model based on this research. VARK stands for visual,

auditory, read/write, and kinesthetic learning styles. Dr. Fleming and Dr. Mills stated

instructors should accommodate different learning styles, but more importantly, empower

students to discover which learning, or combination of styles, best fits them. Research

also showed people have combinations of learning styles rather than an exclusive choice.

This means some students can learn with a combination of kinesthetic and visual learning

or kinesthetic and auditory (Fleming & Mills, 1992).

Optimizing the Learning Experience

Marlene LeFever, author of several learning styles and creative teaching books,

suggested students encounter a successful learning experience if they experience each of

four learning styles. According to LeFever (1995):

Each student will have a place in the cycle where he or she is most

comfortable and can contribute the most excellent work. But even though

different students prefer different places in the cycle, it's important for all

students to go through each of the four steps in the cycle. (p. 15)

LeFever was referring to the imaginative, analytic, common sense, and dynamic learning

cycles. Similar to Gardner and Montessori's research, LeFever suggested students try

different delivery methods to determine which style works best for them.

Sharon Johnson-Arnold, author of several technology-based training books, stated

the students learning environment is an important element in learning. Elements that have

a direct impact on learning are extremely important, according to her studies. Aside from the environment, delivery of material from the teacher is a critical component. She suggests evaluating and improving your delivery method is the key component to student learning. The information can only be effective when the teacher is well prepared to deliver in a clear and logical fashion. It is also important before beginning training that the employees are comfortable in the environment so learning will be in its optimal state. This requires managers to address issues with an uncomfortable learning environment. Johnson-Arnold indicated an important factor in training is how the training is delivered to the employees (Johnson-Arnold, 2010).

There are many learning tools associated with training. These tools aid trainees in understanding material or may be essential in comprehending complex procedures. One tool in particular is a reference guide. Robert Pike suggested using handouts to provide additional content that was not covered in the classroom. Pike showed effective training is accompanied by tangible documents for future reference (Pike, 2002).

There are several publications on learning behaviors and learning styles. In one particular study, Hawk & Shah (2007) studied certain faculty members to determine the effect learning styles have on their teaching experience. The study introduced several different learning models; Kolb experiment, Gregorc Learning Style model, VARK model, Felder-Silverman learning model, Dunn and Dunn learning and RASI (Revised Approaches to Studying Inventory) model. They found that faculty members initially adopt a teaching style that accommodates their own learning behaviors and has proven to be effective in their educational programs. Hawk and Shah stated instructors should step

out of their comfort zone and explore different methods of teaching (Hawk & Shah, 2007).

Linda Wong, author of several training books, suggested instructors initially use the learning style they are comfortable with early in their career. She suggested when instructors step out of their comfort zone and address student learning by acknowledging different learning styles, students will respond positively (Wong, 2006). Hawk and Shah (2007) suggested instructors should include expanding research to encompass more learning styles outside the six systems in this article. They recommended that there are theories and new ideas surfacing frequently, and educators need to take advantage of innovative ideas. They indicated research on the reliability and validity of instruments used is also necessary. They believed the context in which learning occurs is very important. Those contexts include the interaction among individuals in the course as well as the course and instructor interaction in regards to the physical environment, historical, cultural, and political background of the country. They asserted traditional methods of teaching only accommodate a few individuals, as other students need a different approach to the material.

Researchers argue learning style instruments used to measure different constructs are fragmented. Leite, Svinicki, & Shi (2009) stated:

Learning style instruments tend to be constructed in isolation from one
another without much attempt to validate their underlying constructs, but
because the concept of style appeals so strongly to educators and learners
alike, there is often a rush to implementation without adequate analysis of
the properties of the instrument. (p. 325)

They believed the tools were implemented hastily without proper research. The instruments are mainstream concepts, so the rush to get these tools implemented was high. Educators must be careful and consider the pros and cons of using systems that are popular, but with little to no research to validate their quality (Leite, Svinicki, & Shi, 2009).

Importance of Technology in Education

Howard Gardner, a psychologist and professor of neuroscience from Harvard University, developed the theory of "Multiple Intelligences" in 1983. This theory has grown from an initial seven intelligences to nine that are studied today. According to Gardner, human beings have nine different kinds of intelligences that reflect different ways of interacting with the world. Although students each have all nine, no two individuals have them in the same configuration, similar to fingerprints. Gardner published an article, *Can Technology Exploit Our Many Ways of Knowing*, where he explored the effect technology has on learning styles. He discovered if technology were used to accommodate the different learning styles, students would receive a more positive experience. He stated that the use of technology is critical in instruction deployment. He believed full optimization of the technological resources was the best method of delivering education. The key to link technology with the student's learning experience is innovation. Gardner believed using technology in innovative ways taps into the learning behaviors of students. This allows the information to be delivered in methods students can understand. Technology has the capability to show instruction to students who would normally struggle with traditional methods (Gardner, 2000).

Lynch (2004) asserted that it is important to use electronic communication in teaching. This allows the student and instructor to be flexible in learning experiences. It removes the student's need to be at a certain location to receive instruction. It allows students to learn on their own and teachers to grade classwork without time constraints. Online systems such as the Blackboard learning management system and Tegrity allow students to connect synchronously and asynchronously to share information and hold classes in a virtual environment. Tegrity is a separate software package connected through Blackboard that allows students to receive recorded lectures online rather than face-to-face. Because of the flexibility and convenience of virtual communication in higher learning, the demand for fast and accurate support is imperative. Without a support system, stakeholders experience delays in the online academic experience.

Dr. Tracy Gardner of the Colorado School of Mines conducted a study to determine if the student-learning gains improve when exposed to simulators. She chose six different topics in two courses. Process Dynamics and Control and Fluid Mechanics are the classes observed because students in those areas have historically had issues visualizing the connections between the calculations and the physical processes. There were 40 students in the Fluid Mechanics course and 42 students in the Process Dynamics and Control course. The students used stylus devices to work, communicate, and provide answers to questions. Stylus devices are computers that allow the user to write on-screen using a pen-like instrument. This process creates a virtual representation of the user's penmanship. The questions would be in the form of equations, graphs, words, numbers, etc. InkSurvey was the software used to accept the digital input. It is a web-based whiteboard tool that the instructor can view real-time work from students from a

centralized computer. The research looked at the participation and involvements students had with each other and the instructor via the software. The conclusions indicated the students achieved large and statistically significant learning gains using interactive simulations. The level of competence across the six topics increased from 45% to 58% when they were allowed to "play" with the simulators. The students' understanding of the topics increased to 78% when the instructor used scaffolding questions (Gardner, Kowalski, & Kowalski, 2007).

Increase of Online Classes

Lytle (2011) stated that in 2010, 6.1 million students took at least one online class during the fall semester. This is a 10.1% increase over fall enrollment in 2009. Online courses are defined as 80% of all content is delivered online and there are no face-to-face meetings with instructors.

A Comparison of Different Training Programs

There are published sources that identify the impact of optimizing IT-based training has on an organization. Kondas (1990) of the United States Air Force developed a thesis that compared in-house and vendor-provided IT training methods in the Air Force from a cost effective and optimal training experience point of view. In his study, Kondas discovered his subjects preferred a classroom-style of training environment to computer-based and video-based delivery method. Kondas also discovered that there was no significant difference between training developed in-house and vendor-offered training in regards to trainee preference. Captain Kondas' study sought to determine which training method was preferred by the trainees and costs associated with the training programs.

Summary

Since the beginning of the 20th century, several learning styles have been identified. Learning styles are the natural pattern of retaining information in a learning situation. Students will encounter several methods and eventually choose which method works for them. Studies showed students learn the best when they are left to explore information on their own. Students make a choice on which learning styles best suits their needs. Instructors have an important part in learning behaviors. Instructors should optimize their delivery methods to ensure the best experience for students. Studies showed instructors tend to teach using delivery methods based on how they learn and do not necessarily accommodate learning behaviors of the students. Research showed using technology to aid in learning is crucial as it allows students to have better learning experiences. Innovation through the use of technology is a key component in student learning. Research indicated that online classes are increasing in popularity. The demand for IT support increases as more students and instructors are actively involved in using technology.

Methodology

Participants

The surveys were designed to measure effectiveness of training in each of the three categories of training: IT Helpdesk-specific, Technical Support Services-specific, and IT division-specific. The training was divided up into three different categories to identify milestones in training progression. The separation into three different categories did not have an affect on the hypothesis. Test statistic calculations were based on training on all three categories combined instead of independently. There were twelve students divided into two groups of six. The participants were IT Helpdesk student consultants ranging from 18 to 22 years old. Each participant was enrolled in WKU classes and employed as an IT Helpdesk consultant in TSS. The participants were exposed to live support sessions after completing training.

Instrumentation and Materials

This study used two identical surveys. One survey was administered to a pool of six students that completed the Student Certification program and the other survey was administered to a pool of six students that completed CADET. The survey consisted of 27 statements. The only difference between the surveys was the title of the survey. Participants in the Student Certification program took the survey titled *Student Certification Program Survey*. Participants in the CADET training program took the survey titled *CADET Training Survey*. Each student was required to complete only one survey based on the training program they completed. The Qualtrics survey package software was used to create and administer the surveys. The surveys were designed to determine if training was adequate in preparing consultants for their jobs. The statements

were worded suggesting training was adequate and the participants are required to respond based on their live session experiences. All students were required to complete the survey within one week. This allowed each student to have the same amount of time between training, live sessions, and survey responding. This system eliminated long delays between training and survey completion. Long delays in survey completion may result in inaccurate student responses depending on how long each student retains information after training completion.

Procedures

The survey used a matrix table that included strongly agree, agree, neutral, disagree, and strongly disagree as the responses. The statements were formulated objectively. Opinions or persuading statements about the research were not present in the survey, so bias was not factor. The results from the surveys were compared to determine adequacy in preparing students to perform their job duties. Each response was assigned a value ranging from one to five. One is the value for strongly disagree and five is the value for strongly agree. The survey that had the highest mean suggested the more adequate training program. Table 2 shows page one, the IT Helpdesk-specific training items, on both Student Certification program and CADET training surveys.

Table 2

Survey Statements for IT Helpdesk-Specific Training

Survey Statement	SD	D	N	A	SA
The training you received on the Help Desk case tracking system was adequate in preparing you to utilize the software.	☐	☐	☐	☐	☐
The training you received on Phone Usage was adequate in preparing you to utilize the phones.	☐	☐	☐	☐	☐
The training you received on GoToAssist was adequate in preparing you to utilize the HelpAlert client.	☐	☐	☐	☐	☐
The training you received on the Student Stations was adequate in preparing you to utilize the call center computers.	☐	☐	☐	☐	☐
The training you received on Help Desk Etiquette was adequate in preparing you for client-consultant communication.	☐	☐	☐	☐	☐
The training you received on E-mail was adequate in preparing you for supporting E-mail-based questions.	☐	☐	☐	☐	☐
The training you received on Accounts, Policies and Password Reset Procedures was adequate in preparing you to manage client accounts.	☐	☐	☐	☐	☐
The training you received on the Help Desk Internal Database was adequate in preparing you to utilize the service.	☐	☐	☐	☐	☐
The training you received on the Call Flow Guides was adequate in preparing you for ticket generating procedures.	☐	☐	☐	☐	☐
Overall, basic help desk training has been effective in getting me prepared for logging cases and troubleshooting common questions.	☐	☐	☐	☐	☐

Note: SD = Strongly Disagree; D = Disagree; N = Neither Agree nor Disagree; A = Agree; SD = Strongly Agree.

Table 3 shows the survey for Technical Support Services-specific training items as they appeared to the student participants on both Student Certification and CADET surveys. This part of the survey appeared on a separate page from the IT-Helpdesk-specific statements.

Table 3

Survey Statements for Technical Support Services -Specific Training

Survey Statement	SD	D	N	A	SA
The training you received on the Desktop Support Overview was adequate in preparing you to troubleshoot Desktop Support-related issues.	☐	☐	☐	☐	☐
The training you received on Active Directory was adequate in preparing you to support Active Directory problems and requests.	☐	☐	☐	☐	☐
The training you received on Exchange Tools was adequate in preparing you to support Exchange problems and requests.	☐	☐	☐	☐	☐
The training you received on installing printers was adequate in preparing you to manage printers on WKU campus.	☐	☐	☐	☐	☐
Overall, Desktop Support training has been effective in getting me prepared to address Desktop Support-related issues.	☐	☐	☐	☐	☐

Note: SD = Strongly Disagree; D = Disagree; N = Neither Agree nor Disagree; A = Agree; SD = Strongly Agree.

Table 4 shows the IT-division specific survey statements as they appeared to the student participants on both Student Certification and CADET surveys.

Table 4

Survey Statements for IT Division-Specific Training

Survey Statement	SD	D	N	A	SA
The training you received on Communication Technologies Overview was adequate in preparing you to troubleshoot Communication Technologies-related issues.	☐	☐	☐	☐	☐
The training you received on Game Console Registrations was adequate in preparing you to assist clients in registering their game consoles.	☐	☐	☐	☐	☐
The training you received on Internet Connectivity and Network Admission Center was adequate in preparing you to troubleshoot internet-related issues.	☐	☐	☐	☐	☐
The training you received on Academic Technology Overview was adequate in preparing you to troubleshoot Academic Technology-related issues.	☐	☐	☐	☐	☐
The training you received on the Software Center was adequate in preparing you to support questions regarding the software center.	☐	☐	☐	☐	☐
The training you received on Departmental Labs and Classroom Technology was adequate in assisting you in troubleshooting Labs- and Classroom-related issues.	☐	☐	☐	☐	☐
The training you received on Administrative Systems and Applications Overview was adequate in preparing you to troubleshoot ASA-related issues.	☐	☐	☐	☐	☐
The training you received on Banner was adequate in preparing you to troubleshoot Banner-related issues.	☐	☐	☐	☐	☐
The training you received on Secure File Transfer Protocol (SFTP) was adequate in preparing you to troubleshoot SFTP-related issues.	☐	☐	☐	☐	☐
The training you received on Portal was adequate in preparing you to troubleshoot Portal-related issues.	☐	☐	☐	☐	☐
The training you received on TopNet was adequate in preparing you to troubleshoot TopNet-related issues.	☐	☐	☐	☐	☐
Overall, Third Level training has been effective in getting me prepared to address WKU IT-related issues.	☐	☐	☐	☐	☐

Note: SD = Strongly Disagree; D = Disagree; N = Neither Agree nor Disagree; A = Agree; SD = Strongly Agree.

Method of Data Analysis

This study determined if there was a difference between two IT-support training programs at Western Kentucky University and the significance of the difference. CADET training and Student Certification program are the focal points of the study.

Using a one-tailed t-test for independent samples, the study sought to determine that CADET training is more adequate in preparing students than the Student Certification program. The alternative hypothesis stated CADET training program was better than the Student Certification program. The t-test allowed the researcher to assess statistical significance of the difference between the Student Certification program and CADET training, using an alpha value of .005, this indicated a 99.5% confidence level. After the test statistic and critical values were calculated and compared, the decision to reject or retain the null hypothesis was reached. Retaining the null hypothesis would mean there was no difference between the training programs.

To support the claim that CADET was better than the Student Certification program, the test statistic would need to fall within the rejection region. The farther away the test statistic was from the critical value in the rejection region would represent how significant the difference was between both programs regarding training adequacy.

This research used the pooled variance method to calculate the test statistic that was used to reject or retain the null hypothesis based on the critical value. The formula used to determine the test statistic is shown in Figure 1.

$$t = \frac{\bar{x}_1 - \bar{x}_2}{S_p \sqrt{1/n_1 + 1/n_2}}$$

Figure 1. Test statistic formula

The $\bar{x}_1$ value represents the grand mean of the 27 responses from the Student Certification survey questionnaire. The $\bar{x}_2$ values represent the grand mean of the 27 responses from the CADET training program survey. In calculating the grand mean, weighted values for each column were determined. In this study the continuum of; strongly disagree, disagree, neutral, agree, and strongly agree became congruent to weighted values of one, two, three, four, and five respectively. The researcher multiplied the weighted value by the number of responses in each individual column. Once the number was determined for each response, the researcher summed each column and divided by the frequency. The frequency was the total number of participants in each survey. The following figure shows the formula for calculating the mean value where n represented the number of responses, w was the weighted value assigned to each possible response, and f was the number of participants. Figure 2 shows the formula used to calculate mean values.

$$\bar{x} = \frac{n_1(w_1) + n_2(w_2) + n_3(w_3) + n_4(w_4) + n_5(w_5)}{f}$$

Figure 2. Formula to calculate mean values for each survey statement

Table 5 represents an example on the survey with the calculated mean.

Table 5

Sample survey statement that shows mean value

Survey Statement	SD	D	N	A	SA	TR	Mean
The training you received on the Help Desk case tracking system was adequate in preparing you to utilize the software.	0	0	0	3	3	6	4.50

Note: SD = Strongly Disagree; D = Disagree; N = Neither Agree nor Disagree; A = Agree; SD = Strongly Agree; TR = Total Responses.

Once the mean was identified for all statements, all means were summed and divided by 27 to find the grand mean. The next calculation was the pooled variance that is indicated with S_p. Figure 3 shows the formula used to calculate the pooled variance.

$$S_p = \frac{\sqrt{(n_1 - 1)s_1{}^2 + (n_2 - 1)s_2{}^2}}{n_1 + n_2 - 2}$$

Figure 3. Pooled variance formula

Once the pooled variance was calculated, the number was used in determining the test statistic. The remaining calculations were the variances as noted by s^2 in the pooled variance formula. To find the variance of the data set, the researcher calculated the sum of squares and divided by $n - 1$. Figure 4 shows the sum of squares formula.

$$SS = \sum_{i=1}^{n} (y_i - \bar{y})^2$$

Figure 4. Sum of squares formula

The first survey statement data were used to demonstrate how to calculate the sum of squares. Figure 5 shows how a sample calculation appeared for each survey statement.

$$SS = (2.83 - 1)^2 + (2.83 - 2)^2 + (2.83 - 2)^2 + (2.83 - 3)^2 + (2.83 - 4)^2 + (2.83 - 5)$$

Figure 5. Sum of squares sample calculation

To calculate the variance, the researcher divided the sum of squares by $n - 1$. Figure 6 shows the variance formula.

$$S^2 = \frac{\sum_{i=1}^{n} (y_i - \bar{y})^2}{n - 1}$$

Figure 6. Variance formula

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In the example above, *n* represents the number of respondents to the survey. The survey questionnaire used six participants. There were six respondents with each training program. This calculation was used twice because there were two training programs that had six respondents each.

Taking the number of participants in the Student Certification program and adding it to the number of participants in the CADET training program and subtracting two determined the degrees of freedom. Figure 7 shows the degrees of freedom used in the research.

$$df = n_1 + n_2 - 2$$

Figure 7. Degrees of freedom formula

Once the degrees of freedom were calculated and the confidence levels were determined, the critical value was identified using a *t* distribution critical values table.

Threats to Validity

Students were required to give their full attention and cooperation during training. Students were given access to outside websites beyond CADET, so time could have been placed on personal activities instead of training. Isolating students in an environment free of outside distractions such as a classroom or conference room would maximize concentration. During Student Certification training, students and the trainer were isolated in a conference room to minimize distractions. During CADET training, students used the computers located in the IT Helpdesk. Students were asked to refrain from navigating online outside of training to minimize distractions from non-training websites. Students were asked to truthfully report on their experiences with the training they received. Opinions and past experiences with IT support may have caused validity issues

with the responses. If participants waited a long time between training and taking live calls, training could have become less effective. Participants were required to submit survey results within a week after completing training so the amount of time between training and live calls was identical amongst all participants. Incorrect training could have resulted in validity issues. IT Helpdesk staff members were tasked to review the training periodically throughout the semester for inconsistencies, outdated training, and incorrect information.

For survey improvements to minimize validity issues, create a drop-down box including the entries Student Certification Program and CADET at the beginning of a single survey. However, this gives the students control on which training program the responses are intended for.

Findings or Results

All student participants submitted a survey within a week after completing

training. Table 6 shows the results from the participant submissions in IT Helpdesk

training in the Student Certification program survey.

Table 6

Results from the IT Helpdesk-Specific Training Taken by Students in the Student Certification Program

Survey Statement	SD	D	N	A	SA
The training you received on the Help Desk case tracking system was adequate in preparing you to utilize the software.	1	2	1	1	1
The training you received on Phone Usage was adequate in preparing you to utilize the phones.	1	2	1	2	0
The training you received on GoToAssist was adequate in preparing you to utilize the HelpAlert client.	2	0	1	2	1
The training you received on the Student Stations was adequate in preparing you to utilize the call center computers.	0	2	2	1	1
The training you received on Help Desk Etiquette was adequate in preparing you for client-consultant communication.	1	0	1	4	0
The training you received on E-mail was adequate in preparing you for supporting E-mail-based questions.	2	1	0	2	1
The training you received on Accounts, Policies and Password Reset Procedures was adequate in preparing you to manage client accounts.	1	1	1	1	2
The training you received on the Help Desk Internal Database was adequate in preparing you to utilize the service.	1	1	0	3	1
The training you received on the Call Flow Guides was adequate in preparing you for ticket generating procedures.	0	0	1	4	1
Overall, basic help desk training has been effective in getting me prepared for logging cases and troubleshooting common questions.	0	1	1	3	1

Note: SD = Strongly Disagree; D = Disagree; N = Neither Agree nor Disagree; A = Agree; SD = Strongly Agree.

Table 7 shows the student responses for TSS training in the Student Certification program survey.

Table 7

Results from the Technical Support Services-specific Training Taken by Students in the Student Certification Program

Survey Statement	SD	D	N	A	SA
The training you received on the Desktop Support Overview was adequate in preparing you to troubleshoot Desktop Support-related issues.	1	1	1	2	1
The training you received on Active Directory was adequate in preparing you to support Active Directory problems and requests.	1	2	1	1	1
The training you received on Exchange Tools was adequate in preparing you to support Exchange problems and requests.	3	1	0	2	0
The training you received on installing printers was adequate in preparing you to manage printers on WKU campus.	1	2	0	2	1
Overall, Desktop Support training has been effective in getting me prepared to address Desktop Support-related issues.	1	0	2	2	1

Note: SD = Strongly Disagree; D = Disagree; N = Neither Agree nor Disagree; A = Agree; SD = Strongly Agree.

Table 8 shows the participant results from participant submissions for IT Division training in the Student Certification program survey.

Table 8

Results from the IT Division-specific Training Taken by Students in the Student Certification Program

Survey Statement	SD	D	N	A	SA
The training you received on Communication Technologies Overview was adequate in preparing you to troubleshoot Communication Technologies-related issues.	0	3	0	3	0
The training you received on Game Console Registrations was adequate in preparing you to assist clients in registering their game consoles.	2	0	0	1	3
The training you received on Internet Connectivity and Network Admission Center was adequate in preparing you to troubleshoot internet-related issues.	1	1	1	2	1
The training you received on Academic Technology Overview was adequate in preparing you to troubleshoot Academic Technology-related issues.	1	1	1	3	0
The training you received on the Software Center was adequate in preparing you to support questions regarding the software center.	0	2	1	2	1
The training you received on Departmental Labs and Classroom Technology was adequate in assisting you in troubleshooting Labs- and Classroom-related issues.	1	2	1	2	0
The training you received on Administrative Systems and Applications Overview was adequate in preparing you to troubleshoot ASA-related issues.	0	2	2	1	1
The training you received on Banner was adequate in preparing you to troubleshoot Banner-related issues.	2	1	0	3	0
The training you received on Secure File Transfer Protocol (SFTP) was adequate in preparing you to troubleshoot SFTP-related issues.	2	1	2	1	0
The training you received on Portal was adequate in preparing you to troubleshoot Portal-related issues.	1	1	1	3	0
The training you received on TopNet was adequate in preparing you to troubleshoot TopNet-related issues.	1	2	0	2	1
Overall, Third Level training has been effective in getting me prepared to address WKU IT-related issues.	0	1	2	3	0

Note: SD = Strongly Disagree; D = Disagree; N = Neither Agree nor Disagree; A = Agree; SD = Strongly Agree.

Table 9 shows the student responses for IT Helpdesk training in the CADET survey.

Table 9

Results from the IT Helpdesk-Specific Training Taken by Students in the CADET Program

Survey Statement	SD	D	N	A	SA
The training you received on the Help Desk case tracking system was adequate in preparing you to utilize the software.	0	0	0	3	3
The training you received on Phone Usage was adequate in preparing you to utilize the phones.	0	0	1	3	2
The training you received on GoToAssist was adequate in preparing you to utilize the HelpAlert client.	0	0	0	3	3
The training you received on the Student Stations was adequate in preparing you to utilize the call center computers.	0	0	3	1	2
The training you received on Help Desk Etiquette was adequate in preparing you for client-consultant communication.	0	0	1	1	4
The training you received on E-mail was adequate in preparing you for supporting E-mail-based questions.	0	1	0	2	3
The training you received on Accounts, Policies and Password Reset Procedures was adequate in preparing you to manage client accounts.	0	0	1	2	3
The training you received on the Help Desk Internal Database was adequate in preparing you to utilize the service.	0	1	1	1	3
The training you received on the Call Flow Guides was adequate in preparing you for ticket generating procedures.	0	0	1	4	1
Overall, basic help desk training has been effective in getting me prepared for logging cases and troubleshooting common questions.	0	0	0	4	2

Note: SD = Strongly Disagree; D = Disagree; N = Neither Agree nor Disagree; A = Agree; SD = Strongly Agree.

Table 10 shows the participant submissions for Technical Support Services

training in the CADET survey.

Table 10

Results from the Technical Support Services-specific Training Taken by Students in the CADET Program

Survey Statement	SD	D	N	A	SA
The training you received on the Desktop Support Overview was adequate in preparing you to troubleshoot Desktop Support-related issues.	0	0	1	3	2
The training you received on Active Directory was adequate in preparing you to support Active Directory problems and requests.	0	0	1	2	3
The training you received on Exchange Tools was adequate in preparing you to support Exchange problems and requests.	0	1	1	2	2
The training you received on installing printers was adequate in preparing you to manage printers on WKU campus.	0	0	0	3	2
Overall, Desktop Support training has been effective in getting me prepared to address Desktop Support-related issues.	0	0	0	4	2

Note: SD = Strongly Disagree; D = Disagree; N = Neither Agree nor Disagree; A = Agree; SD = Strongly Agree.

Table 11 shows the participant submissions for IT Division training in the

CADET survey.

Table 11

Results from the IT Division-specific Training Taken by Students in the CADET Program

Survey Statement	SD	D	N	A	SA
The training you received on Communication Technologies Overview was adequate in preparing you to troubleshoot Communication Technologies-related issues.	0	0	1	3	2
The training you received on Game Console Registrations was adequate in preparing you to assist clients in registering their game consoles.	0	0	0	1	5
The training you received on Internet Connectivity and Network Admission Center was adequate in preparing you to troubleshoot internet-related issues.	0	0	0	3	3
The training you received on Academic Technology Overview was adequate in preparing you to troubleshoot Academic Technology-related issues.	0	0	0	3	3
The training you received on the Software Center was adequate in preparing you to support questions regarding the software center.	0	1	0	1	4
The training you received on Departmental Labs and Classroom Technology was adequate in assisting you in troubleshooting Labs- and Classroom-related issues.	0	1	2	0	3
The training you received on Administrative Systems and Applications Overview was adequate in preparing you to troubleshoot ASA-related issues.	0	0	1	3	2
The training you received on Banner was adequate in preparing you to troubleshoot Banner-related issues.	1	0	0	3	2
The training you received on Secure File Transfer Protocol (SFTP) was adequate in preparing you to troubleshoot SFTP-related issues.	0	1	0	3	2
The training you received on Portal was adequate in preparing you to troubleshoot Portal-related issues.	0	1	1	2	2
The training you received on TopNet was adequate in preparing you to troubleshoot TopNet-related issues.	0	1	0	1	4
Overall, Third Level training has been effective in getting me prepared to address WKU IT-related issues.	0	0	0	4	2

Note: SD = Strongly Disagree; D = Disagree; N = Neither Agree nor Disagree; A = Agree; SD = Strongly Agree.

The Qualtrics software computed the mean, variance, and standard deviation.

Table 12 shows the responses for the 27 training session survey statements. Figure 8

shows the significance of the responses between the training programs. One indicates a

"Strongly Disagree" response, two is an "Agree" response, three is a "Neutral" response,

four is an "Agree" response, and five is a "Strongly Agree" response.

Table 12

Mean, Variance, and Standard Deviation results from the SCP and CADET survey

	Student Certification Program			CADET Program		
	Mean	Variance	Standard Deviation	Mean	Variance	Standard Deviation
Statement 1	2.83	2.17	1.47	4.5	.3	.55
Statement 2	2.67	1.47	1.21	4.17	.57	.75
Statement 3	3	2.8	1.67	4.5	.3	.55
Statement 4	3.17	1.37	1.17	3.83	.97	.98
Statement 5	3.33	1.47	1.21	4.5	.7	.84
Statement 6	2.83	2.97	1.72	4.17	1.37	1.17
Statement 7	3.33	2.67	1.63	4.33	.67	.82
Statement 8	3.33	2.27	1.51	4	1.6	1.26
Statement 9	4	.4	.63	4	.4	.63
Statement 10	3.67	1.07	1.03	4.33	.27	.52
Statement 11	3.17	2.17	1.47	4.17	.57	.75
Statement 12	2.83	2.17	1.47	4.33	.67	.82
Statement 13	2.17	2.17	1.47	3.83	1.37	1.17
Statement 14	3	2.4	1.55	4.5	.3	.55
Statement 15	3.33	1.87	1.37	4.33	.27	.52
Statement 16	3	1.2	1.1	4.17	.57	.75
Statement 17	3.5	3.9	1.97	4.83	.17	.41
Statement 18	3.17	2.17	1.47	4.5	.3	.55
Statement 19	3	1.6	1.26	4.5	.3	.55
Statement 20	3.33	1.47	1.21	4.33	1.47	1.21
Statement 21	2.67	1.47	1.21	3.83	1.77	1.33
Statement 22	3.17	1.37	1.17	4.17	.57	.75
Statement 23	2.67	2.27	1.51	3.83	2.17	1.47
Statement 24	2.33	1.47	1.21	4	1.2	1.1
Statement 25	3	1.6	1.26	3.83	1.37	1.17
Statement 26	3	2.4	1.55	4.33	1.47	1.21
Statement 27	3.33	.67	.82	4.33	.27	.52

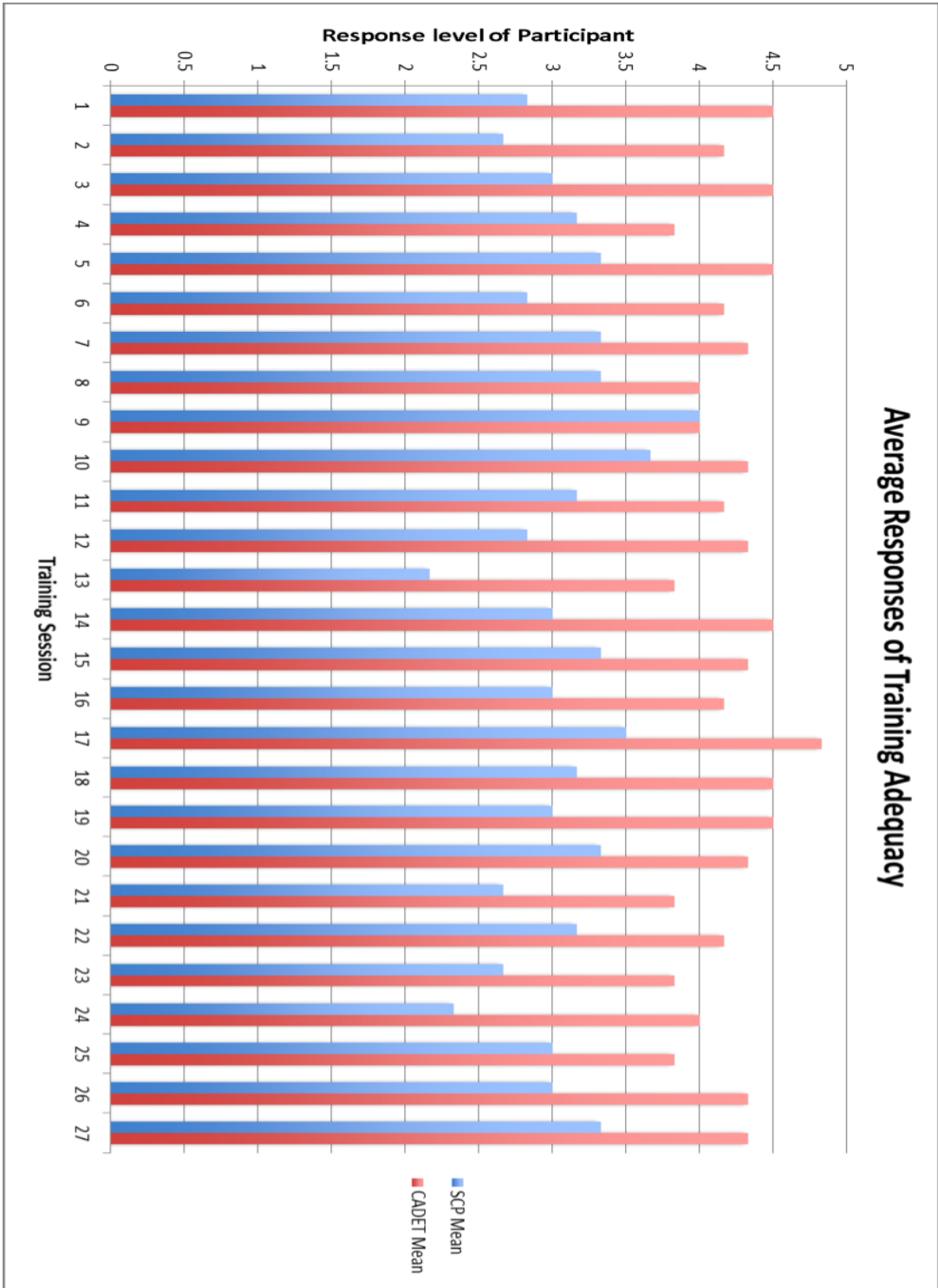*Note:* Statement = Corresponding survey statement in both surveys

Figure 8. Average Responses of Training Adequacy

Conclusions

The survey results showed that 26 out of 27 sessions conducted through CADET training were more adequate in preparing consultants to do their job duties. Each response has a calculated mean value displayed in Table 12. Statement nine states "The training you received on the Call Flow Guides was adequate in preparing you for ticket generating procedures". Figures 8 shows that student responses to statement nine were identical, which leads to similar mean, variance, and standard deviation values identified in Table 12. In both training programs, students received face-to-face training and a document that describes call flow procedures. Training methods for Call Flow guides did not differ between both programs, which resulted in similar responses. Refer to Table 1 for the training methods available to students in the CADET training program. Methods of training delivery are the key component that differed in both training programs. The assumption that CADET training accommodates different learning styles, by delivering training using different methods, suggests a reason why students agree that CADET is more adequate in preparation to do their jobs.

With a calculated test statistic of -5.66 and compared with a critical value of -3.17 using a confidence of 99.5% with $df = 10$, the null hypothesis was rejected.

The null hypothesis stated there was no difference between the Student Certification and CADET training programs. As this was rejected, the alternate hypothesis was retained, indicating the CADET training program grand mean is greater than the Student Certification program. Survey results suggest students are more adequately prepared to work upon completion of the CADET program than the Student Certification program in 26 out of 27 sessions.

With the degrees of freedom equaling ten and the test statistic equaling -5.66, the p value was calculated to .0001. This means that there is a 0.01% probability of obtaining a result as similar to the test statistic obtain from the research assuming the null hypothesis is true.

Recommendations for Future Study

Gardner (2000) indicated that innovation through the means of using technology is a key component to student learning. Educators should keep current with new technologies. Innovative usage of technology is an important factor in delivering instruction. New ideas are developed rapidly with advancements in technology as Gardner (2007) discovered when her students used technology to raise comprehension of coursework significantly.

This research was limited to 12 students at WKU, so using a larger pool of students should yield more accurate results. Restrict personal web browsing outside of online training. This assumes that the institution or company allows internet access outside training-related web pages. Spending time on websites that are not related to training causes delays in training completion. During CADET training, students were informed not to browse outside of the training, but were not monitored. If access to outside content is allowed, monitoring or recording student activity is recommended. This allows trainers to determine if time was spent productively during training if issues arise later.

In recent studies, researchers found there is a method of data analysis that would add scientific validity to learning behavior research designs. This method is referred to as the meshing hypothesis. The meshing hypothesis includes researchers classifying learners

into different categories such as visual, auditory, and kinesthetic. After the category classification, researchers assign the learners to one of several random learning methods and conduct the experiment. After the experiment, all learners are given the same test to complete. The learners that performed better on the test would suggest a better mesh with the learning method used to deliver instruction (Bjork, McDaniel, Pashler, & Rohrer, 2008). There has not been significant usage of this method to debunk learning styles hypothesis. Learning style research involves assessing student-learning behaviors and shaping the environment to accommodate the learning styles. The researchers claim that the mesh method has validity over the learning styles. Research suggests that learners do show significant gains when specific learning styles are paired with accommodating teaching methods. The meshing hypothesis has yielded results that should be taken in consideration when studying learning styles. The experimental process of the meshing should be implemented in further research to strengthen or debunk the validity.

References

Bloom, B. S. (1984). *Taxonomy of educational objectives.* Longman, NY: Addison Wesley Publishing Company.

Bjork, R., McDaniel, M., Pashler, H., &Rohrer, D. (2008). Learning styles: Concepts and evidence. *Psychological Science in the Public Interest. 9,* 106-116. Retrieved from http://www.psychologicalscience.org/journals/pspi/PSPI_9_3.pdf

Fleming, N. D. (2001). *Teaching and learning styles: VARK strategies.* Christchurch, New Zealand: Author.

Fleming, N. D., & Mills, C. (1992). *Not another inventory, rather a catalyst for reflection* [PDF]. Retrieved from http://digitalcommons.unl.edu/cgi/viewcontent.cgi?article=1245&context=podimproveacad

Gardner, H. (2000). *Can technology exploit our many ways of knowing* [PDF]. Retrieved from http://howardgardner01.files.wordpress.com/2012/06/can-technology-exploit-our-many-ways-of-knowing3.pdf

Gardner, T.Q., Kowalski, S.E., & Kowalski, F.V. (2007). *Interactive simulations coupled with realtime formative assessment to enhance student learning* (AC 2012-5123). Retrieved from American Society for Engineering Education website: http://www.asee.org/public/conferences/8/papers/5123/download

Hawk, T; Shah, A. (2007). Using learning style instruments to enhance Student Learning. *Decision Sciences Journal of Innovative Education*, *5*, 1-17. doi: 10.1111/j.1540-4609.2007.00125.x

James, W., & Gardner, D. (1995). Learning styles: Implications for distance learning. *Wiley Online Library*, *67,* 19-31. doi: 10.1002/ace.36719956705

Johnson-Arnold, S. (2010). *Techniques for Technology Training*. Bloomington, IN: AuthorHouse.

Kondas, D. (1990). *A comparison of microcomputer training methods and sources* (Master's Thesis). Available from The Defense Technical Information Center database. (ADA216349)

LeFever, M. (1995). *Learning styles*. Colorado Springs, CO: David C. Cook.

Leite, W. L., Svinicki, M., & Shi, Y. (2009). Attempted validation of the scores of the VARK: Learning styles inventory with multitrait–multimethod confirmatory factor

analysis models. *Educational and Psychological Measurement, 70,* 323-339. doi: 10.1177/0013164409344507

Lillard, A. (2005). *Montessori: The science behind the genius.* New York, NY: Oxford University Press, Inc.

Lytle, R. (2011). *Study: Online education continues growth*. Retrieved from US News Education Online website: http://www.usnews.com/education/online-education/articles/2011/11/11/study-online-education-continues-growth

Lynch, M. (2004). *Learning online: A guide to success in the virtual classroom*. New York, NY: RoutledgeFalmer.

Myers, I. B., & Myers, P. B. (1995). *Gifts differing: Understanding personality Type.* Mountain View, CA: Davies-Black Publishing.

Pike, R. (2002). *Creative training techniques handbook: Tips, tactics, and how-to's for delivering effective training*. Amherst, MA: HRD Press, Inc.

Ruf, D. L. (2003). *Use of the SB5 in the assessment of high abilities.* (Stanford-Binet Intelligence Scales, Fifth Edition Assessment Service Bulletin No. 3). Itasca, IL: Riverside Publishing.

Switzer, L. (2012, March 16). More taking online classes. *Daily News.* Retrieved from http://www.bgdailynews.com/news/more-taking-online-classes/article_c15a9847-43ad-5699-b468-556b8cf9f40a.html?mode=jqm

Wong, L. (2006). *Essential study skills (7th ed.).* Boston, MA: Cengage Learning.