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COMPLIANCE SAFETY AND HEALTH OFFICER
APPRENTICESHIP PROGRAM
EXPENDITURE ANALYSIS

A Research Paper Presented to the Graduate Faculty
of the Department of STEM Education and Professional Studies
at Old Dominion University

In Partial Fulfillment of the Requirements for the Degree
Master of Science in Occupational and Technical Studies

By
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August 2010

APPROVAL PAGE

This research paper was prepared by Marie Lopez under the direction of Dr. John M. Ritz in OTED 636, Problems in Occupational and Technical Studies. It was submitted to the Graduate Program Director as partial fulfillment of the requirements for the Degree of Master of Science in Occupational and Technical Studies.

APPROVED BY:

Dr. John M. Ritz

Date

Advisor and Graduate Program Director

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CHAPTER I

INTRODUCTION

The Virginia Department of Labor and Industry (DOLI) promotes apprenticeship programs to all the constituents in the Commonwealth as a way of training existing employees and new hires. As stated in their website, “employers [should] provide on-the-job training for their employees in a variety of occupations, ranging from high tech to highly skilled trades because of the benefit implications for all parties involved” (DOLI, Apprenticeship Programs, 2010, ¶1). Further, this agency oversees the Virginia Registered Apprenticeship program that serves needs for skilled workers in business and industry. Their belief in giving such opportunity to the employee is so strong that apprenticeship opportunities are an integral part of the agency’s certification process of training some of their own employees. One prime example is the Compliance Safety and Health Officer (CSHO) new hire that starts as an apprentice to learn from a more seasoned CSHO. CSHO’s will train under the Virginia DOLI Apprentice program in which they will undergo on-the-job training, as well as, attend safety classes. The apprentice program ensures that safety standards established by the Occupational Safety and Health Administration (OSHA) and the Department are followed.

Most will agree with the vision of the agency’s apprenticeship program that “it is a "win-win" approach to workforce development which provides a combination of on-the-job training and related classroom instruction” (DOLI, Apprenticeship Programs, 2010, ¶1). It also promotes a productive, well-trained, safe workforce for the Commonwealth’s businesses and industries at large. However with current economic environments, is this training method cost effective?

STATEMENT OF THE PROBLEM

The purpose of this study was to explore ways to reduce expenditures in the Compliance Safety and Health Officer's Apprenticeship Program at Virginia Department of Labor and Industry.

RESEARCH OBJECTIVES

To guide this study, the following research objectives were established:

- RO₁: Identify which courses of the CSHO Apprentice Program can be technologically delivered with the same outcome.
- RO₂: Identify which courses of the CSHO Apprentice Program can be given at the Headquarter site with the same outcome.
- RO₃: Calculate all training expenditures of one participant at each region to plan for cost reductions.

BACKGROUND AND SIGNIFICANCE

DOLI seeks highly motivated professionals to work as an apprentice to learn how “to conduct investigations of construction, manufacturing, industrial workplaces to determine compliance with Federal and State Occupational Safety statutes and codes” (DOLI, Human Resources, 2010, ¶4). Under the guidance of Senior Compliance and Safety Officers, “the individual will perform inspections by walking through sites, using test equipment, observing operations, and interviewing staff for case file documentation” (DOLI, Human Resources, 2010, ¶4).

The CSHO will start with apprentice orientation once hired to learn all the details of the program. As soon as the next course is available and if funding permits, the apprentice needs to register for Safety and Health Training at the OSHA Training

Institute (OTI) in Chicago. The OTI provides training on OSHA standards and other safety and health topics. DOLI in turn, covers for all expenses for the CSHO training that will be incurred including travel, lodging, course registrations, and so forth. The courses range between one to five days at a time, where the apprentice will attain workplace safety knowledge and habits.

It is important to recognize the value of the apprenticeship program because once each participant finishes, they will become part of the Virginia Occupational Safety and Health Compliance Program, also known as the VOSH. The VOSH Division within DOLI conducts inspections of private and public sector employers to assure compliance with the laws, standards, and regulations of the Commonwealth (DOLI, Human Resources, 2010, ¶4). The CSHO may issue citations listing violations of the standards and regulations to employers, determines dates by which violations must be abated, and may propose civil monetary penalties for certain types of violations (DOLI, Human Resources, 2010, ¶5). This study will reveal the cost incurred in the training portion for one apprentice of each of the four regions. It will also help determine if there can be other venues to sustain the program with cost reduction with the implementation of an on-site trainer or perhaps distance learning.

LIMITATIONS

Several limitations must be considered when discussing the findings and recommendations of this study. The limitations were that:

- This study was limited to one individual per region that was hired to become a Compliance Safety and Health Officer Apprentice in Virginia.
- This study takes place over a period of one year.

- This study was limited to the costs at the Occupational Safety and Health Administration Training Institute, Chicago, IL.
- This study was limited to the course schedule at the Occupational Safety and Health Administration Training Institute which can hamper the continuation of the apprentice program of the Compliance Safety and Health Officer.
- This study will not include the salaries in the cost estimation for each apprentice.

ASSUMPTIONS

Presuming some factors are considered, the researcher can then suggest several alternatives in Virginia Department of Labor and Industry Apprenticeship Program. The assumptions were as follows:

- Students' primary reason was to train to become a Compliance Safety and Health Officer via the apprenticeship program in the Virginia Department of Labor and Industry.
- The participant was given a curriculum of courses to follow in order to become certified from the apprenticeship program.
- The participant was given the same instructional material, assignments, and evaluations.
- The safety instructor was trained in the proper use of Occupational Safety and Health Administration standards.
- The curriculum follows the same guidelines as the Occupational Safety and Health Administration Training Institute.

- It was assumed that the classroom setting both at Occupational Safety and Health Administration Training Institute and Department of Labor and Industry were similar in structures with regard to the safety and health environment didactics, course load, and field trips.
- The cost incurred for each apprentice is approximately the same and contingent to the region they belong.
- The technology to be used for the training is compatible at all sites.

PROCEDURES

This study assessed four participants that represent each of the four regions at DOLI. DOLI consists of one Headquarter, four regions, and three field offices. Their locations are all throughout Virginia with the Headquarter located in Richmond; the regions are Central, Manassas, Roanoke, and Tidewater; and the field offices are at Abingdon, Lynchburg, and Verona. For the purpose of this study candidates selected were from the regions because these are the point of training. This will enable a cost projection of the apprenticeship program over a three-year period. A datasheet was created by the researcher for each component such as the use of technology to deliver courses in combination with face-to-face instruction, and all expenditures of travel and studies to the OTI site. From the information attained the data will be tabulated and analyzed to determine predictions and recommendations to shift training to Headquarters in Richmond or perhaps by distance education with the use of technology. Courses given at OTI will be evaluated to see which delivery method would be the most appropriate with some of the courses that should be given face-to-face and others that can be developed as a distance instruction component in the apprentice program.

DEFINITION OF TERMS

The following terms are provided to assist the reader:

1. Instructor – one who is qualified through education or training to teach a subject (Merriam-Webster, 2010).
2. Apprenticeship – is a system of training a new generation of practitioners of a skill or trade. Most of their training is done on-the-job while working for an employer who helps the apprentices learn the skills needed to perform their job.
3. Compliance Officer – a person that ensures that policies and procedures are properly met while promoting awareness of laws and regulations governing their area of expertise.
4. Compliance Safety and Health Officer (CSHO) – is a cross-disciplinary area concerned with protecting the safety, health, and welfare of people engaged in work or employment. The goal of the CSHO is to foster a safe work environment (OSHA, 2010).
5. United States Occupational Safety and Health Administration (OSHA) – is an agency of the United States Department of Labor created by Congress under the Occupational Safety and Health Act of 1970. Its mission is to prevent work-related injuries, illnesses, and occupational fatality by issuing and enforcing rules called standards for workplace safety and health (Merriam-Webster, 2010).

6. OSHA Training Institute (OTI) – OSHA Training Institute located in Chicago, IL. OTI provides training on OSHA standards and other safety and health topics (OSHA, 2010).

OVERVIEW OF THE CHAPTERS

This research was designed to analyze the process of the apprenticeship program and the courses they would need to fulfill the requirement of such a program by breaking down which courses are delivered technologically and which courses are given in a face-to-face format to see if program changes are cost effective. Once the components were identified, then the researcher tabulated all the expenditures incurred by one individual of each region to make cost projections.

It is very important to establish cost projections of the apprentice program because of the impact the recession has had on DOLI. To compensate the economical downfall, Governor's have requested to all State agencies to make projections for budget reductions on a yearly basis and ensure that the reductions are followed through. If these projections are not met, justification from each State agency has to be provided to the Governor in due time.

In the following chapters research components that will support the findings of the researcher will be reported. Chapter II will speak of the apprenticeship framework, the concept, and examples of the use of this trend in businesses and industries in the world. It will detail the benefits of having the apprenticeship program in Virginia at DOLI with the use of different delivery methods such as face-to-face or distance instruction. Delivery methods will be contingent to the practicality of the course itself

because some courses need to be interactive and some courses may be technologically delivered.

Chapter III will report how the data will be collected. The findings will be reported in Chapter IV. And in Chapter V, recommendations will be given to support the significance of the study and its usefulness to the apprenticeship program at DOLI. Moreover, recommendations for further research will be provided.

CHAPTER II

REVIEW OF LITERATURE

This chapter will discuss an overview of the adult learning theoretical framework, the apprenticeship training concept, and also the application of the apprenticeship program in other parts of the world and at DOLI inclusively. Within the theoretical framework the origin of adult learning, methods of learning, and levels of learning will be discussed. Also the training concept of apprenticeship in general will be segmented into steps within the cognitive apprenticeship, the levels of proximal development, and the advantage of knowledge dissemination. Further, examples of the apprenticeship concept will be discussed in other parts of the world and in Virginia as well. Additionally, an in-depth discussion will help understand the value of the apprenticeship program at DOLI and some suggestions for cost reduction will be offered.

THEORETICAL FRAMEWORK

Learning starts from the individual's interest to attain new knowledge and individuals have their own learning style. According to Knowles (1973), adults share a number of similar characteristics about how they learn and are based on these characteristics. Curriculum and instruction can be designed to increase the chances of success at learning a new concept. Knowles (1973) also describes that adults learn best when they understand the reason why they need to learn a task. Equally important is to understand that adults learn best when the task can be related to their own life, and thus, learning is associated with the knowledge and experience they already have. Many adults are "connected knowers" in the sense that the "most trustworthy knowledge comes from personal experience" (Belenky, Clinchy, Goldberger & Tarule, 1997, p. 103). Since

adults tend to learn experientially, they approach learning as problem solving and it becomes an active process in which they are motivated to gain the knowledge (Knowles, 1973).

As Merriam, Caffarella, and Baumgartner (2007) explained, “learners need to be highly motivated in the direction of personal change [that may be] linked to the needs of the [industry]” (p.160) and as a result of personal growth, learners become more empowered to learn. Mackeracker (1998) discussed that when “learners are engaged in activities in which skills are being developed physically, cognitively, and socially can be known as the process of cognitive apprenticeship” (p.160). In addition, Mackeracker breaks down the process of cognitive apprenticeship into five stages: (1) modeling phase, in which the facilitator models the skill to be learned; (2) approximating phase, in which the learner imitates the skill; (3) fading phase, in which the learner tries the skill alone in a safe but realistic environment; (4) solo phase, in which self-directed learning takes place, and (5) discussion phase, in which both the trainer and learner discuss the outcomes and generalize the use of the skill in different hypothetical scenarios. In essence, cognitive apprenticeship makes workplace learning more unique because traditional classrooms will not have access to this kind of experiential knowledge.

Learning also has many different levels that move from individuals to groups, then to the levels of communities, and the sharing of information will have maximal benefits for all inclusive (Tynjälä, 2008). This suggestion is very similar to Vygotsky’s (1978) belief of the “zone of proximal development”, in which he explained that through collaboration, higher levels of outcome can be achieved rather than working alone. The proximal level of development theory explains the importance that the more experienced

individuals assist the less experienced individual as a social process. This is the dissemination of funds of knowledge that Gonzalez, Moll, and Amanti (2005) explain throughout their book *Funds of Knowledge*. Funds of knowledge is defined by researchers Gonzalez et al., “to refer to the historically accumulated and culturally developed bodies of knowledge and skills [that are] essential for the individual functioning and well-being” (p.133). This is when the individual shares their cognitive bank in a lesson to provide a meaningful message that taps in the student’s prior knowledge, then the information transferred can be known as funds of knowledge.

Other methods that can be employed when working with adult learners are the use of reflective practice and cognitive apprenticeship. Reflective practice involves thinking through a situation after it has happened or what many consider reflection-in-action (Merriam et al., 2007). This practice can foster new ways of framing and responding to situations while devising new methods for response. As a result, learning will “encompass the interaction of learners and the social environment in which they will function deeming the experiences authentic” (Merriam et al., 2007, p. 238). This also may be applicable to the apprentice program where each participant needs to become highly engaged in the core courses to foster critical reflection on experience. This will challenge learners’ assumptions while validating personal growth through experiential learning.

APPRENTICESHIP CONCEPT

Apprenticeship, as a form of training, has many advocates. The nature of the apprenticeship places emphasis on teaching different ways of thinking about whatever they are learning, as well as, the skills associated with the job. This may also be

considered as a participatory approach in which “newcomer’s participate fully in the learning processes emphasizing learning by using the opportunities offered by the practice itself” (Merriam et al., 2007, p. 242).

Many countries use apprenticeship programs as a tool to train individuals and meet the shortages that the industry might have in a particular trade. In Switzerland, the apprenticeship concept is “the predominant form of vocational education which comprises in what they call a dual system, on-the-job training in a firm accompanied by vocational training” (Haefeli, 2000, p. 2). In Germany, “the apprenticeship system is often regarded as a potential model for other countries because it allows [the private industries] to pay for training in specific general human capital” (Mohrenweiser & Zwick, 2009, p. 631). Since apprenticeship programs are considered to only offer general skills, the net costs during apprenticeship training should be explored. As stated by Mohrenweiser et al. (2009) the costs incurred in apprenticeship training “is a puzzle which has motivated some studies to analyze the sources of company-sponsored general training” (p. 631).

Although cost can be a deterrent factor when establishing an apprenticeship program, many fruitful outcomes can take place. For example, this practice allows the company to pair a seasoned employee with the novice to give the opportunity to transform funds of knowledge from experience to practice (Gonzalez et al., 2005). When a novice starts an apprentice program, there is opportunity for “group working [that will] promote knowledge exchange and expertise sharing and thus, enhances individuals’ learning” (Tynjälä, 2008, p.135). It is safe to say, that in any apprentice program interaction between novices and experts is of crucial importance in workplace learning.

This can be characterized as an extremely social activity, which requires interactive dialogue and involves reflection on past experiences to plan future activities within the apprenticeship program in the workplace.

DOLI-CSHO APPRENTICE PROGRAM OVERVIEW

Many government agencies hold the practice of hiring individuals for apprentice programs. This venue can provide stability and long-term capital gain for the agency itself. A good example is the Compliance Safety and Health Apprenticeship Program at DOLI, in which they hire promising candidates to work and go through the apprentice program under the guidance of a seasoned CSHO. The apprentice program is funded exclusively by the state agency.

The apprenticeship involves a substantial financial commitment from DOLI. The apprenticeship program might have some concerns that the cost might be more than the benefits; therefore it is important to understand the fundamental costs that the agency incurs on each apprentice. The high cost of the apprenticeship program can restrict the amount of employees that will be given the opportunity to train; therefore it is worth considering a model that reduces the cost by making more use of in-house training or the use of distance learning.

In the apprenticeship program the participants have an established curriculum, which each apprentice is expected to follow to the best of their ability. The three-year CSHO apprenticeship program requires each apprentice to attend a sequence of training courses of at least 144 hours per year for a total of 432 total hours over the three-year period. An example of such curriculum was acquired from Department of Labor and Industry. It contains a theoretical course of study as is described in Table 1.

Table 1

DOLI-Apprenticeship program theoretical framework

Virginia Department of Labor and Industry Apprenticeship Program Theoretical Framework					
First Year		Second Year		Third Year	
Course	Hours	Course	Hours	Course	Hours
OSHA 1000	50	OSHA 1410	50	OSHA 1020	25
OSHA 2000	50	OSHA 3090	50	OSHA 3010	24
VOSH Conference	14	VOSH Conference	14	OSHA 3080	30
Training Team Sessions	12	Training Team Sessions	12	VOSH Conference	14
Testing Sessions	10	Testing Sessions	2	Training Team Sessions	12
Cooperative Svcs Sessions	12	Cooperative Svcs Sessions	18	Cooperative Svcs Sessions	18
FEMA Web Class	5	American Red Cross First Aid	8	NSC Defensive Driving	8
				DHRM Classes	16
TOTAL	153	TOTAL	154	TOTAL	147
(Minimum)	144	(Minimum)	144	(Minimum)	144

It is important to clarify that all hours in the curriculum are compliant with what the federal government has determined to be necessary. The courses are usually offered by different venues such as the Occupational Safety and Health Administration Training Institute (OTI), Illinois, DOLI-OSHA Division, DOLI-Cooperative Training Programs Division, American Red Cross, Federal Emergency Management Administration (FEMA), and other venues of instruction that are integrated to facilitate the learning process. All the locations for training can be accessed locally, but the OTI site is located in Illinois.

Each venue listed above has a set schedule of courses in which the each is held at a certain time of the year and space is limited. The goal of the apprentice should focus on

taking the course as soon as each becomes available, but this can be hampered due to budget constraints. Further, it is not easy to achieve this goal because the sequence established by the venues does not account for unforeseen hurdles like inclement weather, job obligations, or conflict in schedules. The courses may be held in one or two venues, but in most cases the apprentice will have to wait until the next year to take a course if they are not able to take it when given. Further into the program, when the apprentice is proximal to the end of the requirements, they should have gained general knowledge in their occupation and thus, become certified by DOLI. DOLI will attest that they are fully capable of working as a CSHO independently and will provide a journeyman certification to them.

This study was designed to also look at the cost of the apprenticeship program for expense reduction with the integration of different venues such as distance education or perhaps an on-site trainer who is certified to teach all OTI courses locally. The aforementioned choices can help absorb some of the cost incurred in travel such as registration, airfare, lodging accommodations, meals, and incidental expenses that each participant of the apprenticeship program had while going to OTI in Illinois. In today's work environment of constant change in technology has created a demand of higher levels of learning in continuous methods of delivery, which can be a very useful tool for the apprenticeship program.

Technology has changed not only the way we learn, but also the contents of what we are learning. Technology has opened a world of incredible opportunity for distance learning. For the student, distance learning allows great flexibility, but in return, demands greater responsibility and maturity. Distance instruction has grown immensely

because of the availability of the courses which can be taken on the internet 24 hours a day, 7 days a week, while other courses can be delivered electronically. This flexibility further attracts companies to use this method of delivery versus incurring travel expenses for employees to attain new knowledge.

Additionally, to maintain the interest of the individual companies there is a need to use innovative delivery methods for the trainee. Therefore, businesses may collaborate in the development and coordination of customized training modules to enhance employee training that will benefit their industries.

SUMMARY

This paper has discussed methods employed in experiential learning such as reflective practice, situated cognition, and cognitive apprenticeships. Reflective practice can be considered one of the main ways in which courses can be structured while learning from experience, which focuses on helping the apprentice learn to make a judgment based on the experience related to the task being learned. Situated cognition views the importance of the social and cultural context of learning. In other words, the physical and social experiences in which apprentices find the tools to use is an integral part of their learning process. The situated framework of the apprentice program makes authentic the experience into a more formal practice of cognitive apprenticeship.

Also, this study will further aid the administrators and facilitators at OTI, the DOLI-OSHA, and the DOLI-Cooperative Programs in determining which classroom type (distance education or on-site lecture) provides for greater success among CSHO's. Chapter III ventures into covering the methods and procedures used in the data collection process of this research.

CHAPTER III

METHODS AND PROCEDURES

This chapter will describe the methods and procedures used in this descriptive study. The population for this study will be identified, the design of the instrument used, and the methods of data collection will be detailed, as is the type of statistical analysis performed.

POPULATION

The population considered under this study consisted of four Compliance Safety and Health Officers that represent each region at DOLI. The regions are Central, Manassas, Roanoke, and Tidewater. All are considered program completers because they have reached the maximum hours required in the CSHO Apprenticeship program, which consists of a total of 432 hours of related instruction over a period of three years, and a required 144 hours per year. The person representing the Central region completed the program in August 25, 2007, Manassas region completed the program on December 25, 2009, Roanoke region completed the program on July 25, 2007, and the Tidewater region completed the program on February 25, 2008.

INSTRUMENT DESIGN

The instrument used in this study was designed to establish which instruction could be delivered in-house or via distance education. The focus will be on the courses given at the OTI site only and the courses needed to complete the apprenticeship program. The instrument design will provide the collection of data to address the following questions:

1. Which courses of the CSHO Apprenticeship Program can be technologically delivered with the same outcome?
2. Which courses of the CSHO Apprenticeship Program can be given at the Headquarter site with the same outcome?
3. What is the cost of all training expenditures of one participant at each region?

The aforementioned questions will be developed into a table format to enable quick responses to the survey. See Appendix A to view a sample of the questionnaire.

METHODS OF DATA COLLECTION

The information was requested directly to DOLI and a list of courses of related instruction was received. A theoretical example of a three-year apprentice program and the contact names for each region was attained as well. A cover letter (Appendix B) and the survey will be mailed to each region. A follow-up letter (Appendix C) will be mailed along with another copy of the survey to remind respondents to complete the survey. Completed surveys should be returned within 10 days of the initial mailing. The protection of human subjects will be clarified in the cover letter and this study will follow all guidelines required by the Human Subject Review Committee at Old Dominion University.

Travel expense will include cost of the course at the OTI site, airfares, lodging, meals, and incidental expenditure estimations. The cost for each course will be found at the OTI website, airfares will be researched at a search engine that will search for the least expensive flight such as Kayak.com. Lodging, meals and incidental expenditures will follow the State Travel Regulations that all Commonwealth employees need to follow, which is located on the Department of Accounts website.

STATISTICAL ANALYSIS

Tabulation of the survey responses will provide the data needed to extract a summary and conclusion part of this study. The percentage of responses per question will be reported, the mean will be calculated on travel costs, and overall cost of one apprentice per region will be tabulated as well.

SUMMARY

Chapter III contained the methods and procedures used in this research study. It described the population targeted, the instrument design, the data collection methods, and the statistical analysis of responses. A survey was used as the research instrument in this study. This chapter established the location that each participant originated to enable cost comparisons and future projections. It also detailed which courses will be analyzed to decide the best methods of instruction. In Chapter IV the statistical analysis of the data will be pursued and the subsequent findings will be presented.

CHAPTER IV

FINDINGS

The purpose of this study was to explore ways to reduce expenditures in the Compliance Safety and Health Officer's Apprenticeship Program at Virginia Department of Labor and Industry. Chapter IV presents the survey results in the form of tables and concludes with a summary of the results.

SURVEY RESPONSE

The survey was delivered to the four regions and 100 percent of the participants returned the survey.

SURVEY RESULTS

The result of each region varied because they had a different set of circumstances. The instrument design was composed of five questions about the courses CSHO's needed to take at the OTI site that are part of the curriculum of the Apprentice program. Each region results will be discussed and summarized following the sequence of each question. Percentages for the courses taken at the OTI site to complete the Apprentice program will be tabulated and suggested delivery methods will be offered. Thereafter, the expenses will be tabulated for each region starting with the registration fees for the courses, an estimated airfare cost, lodging, meals, and incidental expenses. Finally a grand total will be tabulated for each region participants and for DOLI in general. This may serve as reference for the expenditure the apprentice program has over a three-year period for one participant of each of the four regions. This estimation will also help analyze and forecast future recommendations. Below are the regions findings for Central, Manassas, Roanoke, and Tidewater.

Central Region

When the CSHO for the Central Region was hired, most of the courses similar to the courses in the curriculum for the Apprenticeship program were already taken through traditional higher education instruction; therefore most of the courses were waived.

Courses listed in the survey that the CSHO took at the OTI site were three, OTI 1000 Initial Compliance, OSHA 3080 Scaffolding, and OSHA 2260 Permit Required Confined Spaces. Only one course not listed in the survey was taken at the OTI site, which was OTI 1050 Introduction to General Industries Standards for a total of four courses. The four courses were taken in four individual trips to the OTI site.

The Central Region also provided feedback that all of the courses can be given at Headquarters if the agency establishes the program internally. The Central Region stated that courses that need to be given face-to-face were six: OSHA 3010 Excavation, Trenching and Soil Mechanics; OSHA 3080 Scaffolding; OSHA 2080 Cranes and Materials Handling; OSHA 3030 Concrete Forms and Shoring; OSHA 3040 Power Press Guarding; and OSHA 3070 Sawmill and Logging Safety. The Central Region stated the courses that can be technologically delivered were four: OSHA 1410 Inspection Techniques and Legal Aspects; OSHA 1020 Basic Accident Investigation; OSHA 1210 Introduction to Industrial Hygiene for Safety Personnel; and OSHA 1520 Effective Written Communication.

Manassas Region

When the CSHO for the Manassas Region was hired, most of the courses similar to the courses in the curriculum for the Apprenticeship program were already taken through traditional higher education instruction; therefore most of the courses were

waived. Courses listed in the survey that the CSHO took at the OTI site were two, OTI 1000 Initial Compliance; and OSHA 1410 Inspection Techniques and Legal Aspects. Only one course not listed in the survey was taken at the OTI site, which was OSHA 2000 Introduction to Construction Standards for a total of three courses. The three courses were taken in three individual trips to the OTI site.

The Manassas Region also provided feedback that all of the courses can be given at Headquarters if the agency establishes the program internally. The Manassas Region stated that courses that need to be given face-to-face were six: OSHA 3010 Excavation, Trenching and Soil Mechanics; OSHA 3080 Scaffolding; OSHA 2080 Cranes and Materials Handling; OSHA 3030 Concrete Forms and Shoring; OSHA 3040 Power Press Guarding; and OSHA 3070 Sawmill and Logging Safety. The Manassas Region stated the courses that can be technologically delivered were four: OSHA 1410 Inspection Techniques and Legal Aspects; OSHA 1020 Basic Accident Investigation; OSHA 1210 Introduction to Industrial Hygiene for Safety Personnel; and OSHA 1520 Effective Written Communication.

Roanoke Region

The CSHO for the Roanoke Region lacked most of the courses in the curriculum for the Apprenticeship program; therefore most of the courses were taken at the OTI site. Courses listed in the survey that the CSHO took at the OTI site were 12, OTI 1000 Initial Compliance; OSHA 1410 Inspection Techniques and Legal Aspects; OSHA 1020 Basic Accident Investigation; OSHA 3090 Electrical Standards; OSHA 3010 Excavation, Trenching and Soil Mechanics; OSHA 3080 Scaffolding; OSHA 2040 Machinery and Machine Guarding; OSHA 2080 Cranes and Materials Handling; OSHA 1520 Effective

Written Communication; OSHA 2070 Fire Protection and Life Safety; OSHA 2260 Permit Required Confined Spaces; and OSHA 3030 Concrete Forms and Shoring. Only one course not listed in the survey was taken at the OTI site, which was OSHA 2000 Introduction to Construction Standards for a total of 13 courses. Three of the courses were taken on the same trip to the OTI site and thus, a total of 10 trips were made by the CSHO to complete the Apprentice program.

The Roanoke Region also provided feedback that all of the courses can be given at Headquarters if the agency establishes the program internally. The Roanoke Region stated that courses that need to be given face-to-face were six: OSHA 3010 Excavation, Trenching and Soil Mechanics; OSHA 3080 Scaffolding; OSHA 2080 Cranes and Materials Handling; OSHA 3030 Concrete Forms and Shoring; OSHA 3040 Power Press Guarding; and OSHA 3070 Sawmill and Logging Safety. The Roanoke Region stated the courses that can be technologically delivered were 10: OSHA 1410 Inspection Techniques and Legal Aspects; OSHA 1020 Basic Accident Investigation; OSHA 3090 Electrical Standards; OSHA 2040 Machinery and Machine Guarding; OSHA 1210 Introduction to Industrial Hygiene for Safety Personnel; OSHA 1520 Effective Written Communication; OSHA 2070 Fire Protection and Life Safety; OSHA 2200 Industrial Noise; OSHA 2210 Principles of Industrial Ventilation; and OSHA 2260 Permit Required Confined Spaces.

Tidewater Region

The CSHO for the Tidewater Region lacked most of the courses in the curriculum for the Apprenticeship program; therefore most of the courses were taken at the OTI site. Courses listed in the survey that the CSHO took at the OTI site were eight, OTI 1000

Initial Compliance; OSHA 1020 Basic Accident Investigation; OSHA 3090 Electrical Standards; OSHA 3010 Excavation, Trenching and Soil Mechanics; OSHA 3080 Scaffolding; OSHA 2040 Machinery and Machine Guarding; OSHA 2080 Cranes Materials Handling; and OSHA 3040 Power Press Guarding. Only one course not listed in the survey was taken at the OTI site, which was OSHA 2000 Introduction to Construction Standards making a total of nine courses. The nine courses were taken in nine individual trips to the OTI site.

The Tidewater Region also provided feedback that all of the courses can be given at Headquarters if the agency establishes the program internally. The Tidewater Region stated that courses that need to be given face-to-face were six: OSHA 3010 Excavation, Trenching and Soil Mechanics; OSHA 3080 Scaffolding; OSHA 2080 Cranes and Materials Handling; OSHA 3030 Concrete Forms and Shoring; OSHA 3040 Power Press Guarding; and OSHA 3070 Sawmill and Logging Safety. The Tidewater Region stated the courses that can be technologically delivered were 10: OSHA 1410 Inspection Techniques and Legal Aspects; OSHA 1020 Basic Accident Investigation; OSHA 3090 Electrical Standards; OSHA 2040 Machinery and Machine Guarding; OSHA 1210 Introduction to Industrial Hygiene for Safety Personnel; OSHA 1520 Effective Written Communication; OSHA 2070 Fire Protection and Life Safety; OSHA 2200 Industrial Noise; OSHA 2210 Principles of Industrial Ventilation; and OSHA 2260 Permit Required Confined Spaces.

Courses taken at the OTI site

Table 2 will synthesize the aforementioned description of the findings and the letter in each box represents each region in the study, which are Central (C), Manassas

(M), Roanoke (R) and Tidewater (T). The table represents the courses taken at the OTI site and were contingent to the apprentice field specialization. The first column includes the number and title of the courses given at the OTI site, the second column contains the courses taken to complete the program. The last column represents the average of participants for each course taken at the OTI site.

Table 2

Courses taken at the OTI site

OTI Course number/title	Courses taken at OTI site to complete the program	Average of participants in courses taken at OTI site
OTI 1000 Initial Compliance Course	C/M/R/T	100%
OSHA 1410 Insp Tech & Legal Aspects	M/R	50%
OSHA 1020 Basic Accident Investigation	R/T	50%
OSHA 3090 Electrical Standards	R/T	50%
OSHA 3010 Excavation, Trenching & Soil	R/T	50%
OSHA 3080 Scaffolding	C/R/T	75%
OSHA 2040 Machine Guarding	R/T	50%
OSHA 1210 Intro to Industrial Hygiene for Safety Personnel		0%
OSHA 2080 Cranes and Materials Handling	R/T	50%
OSHA 1520 Effective Written Communication	R	25%
OSHA 2200 Industrial Noise		0%
OSHA 2210 Principles of Industrial Ventilation		0%
OSHA 3030 Concrete Forms and Shoring	R	25%
OSHA 3040 Power Press Guarding	T	25%
OSHA 3070 Sawmill and Logging Safety		0%

Table 2 cont.

Courses taken at the OTI site

OTI Course number/title	Courses taken at OTI site to complete the program	Average of participants in courses taken at OTI site
OSHA 1050 Intro to Gen Industries Stds	C	25%
OSHA 2000 Intro to Construction Stds	M/R/T	75%

In summary, the courses that accounted for 100% of participation was one, OSHA 1000. The courses that accounted with 75% of participation were two; OSHA 3080, and OSHA 2000. The courses that accounted with 50% of participation were seven; OSHA 1410, OSHA 1020, OSHA 3090, OSHA 3010, OSHA 2040, OSHA 2080, and OSHA 2060. The courses that accounted with 25% of participation were five; OSHA 1520, OSHA 2070, OSHA 3030, OSHA 3040, and OSHA 1050. The courses with no participation were four; OSHA 1210, OSHA 2200, OSHA 2210, and OSHA 3070.

Suggested Instructional Delivery Method

The survey also reflected the suggested instructional delivery method that the participants saw appropriate, based on the content of each course and the results of the survey can be seen in Table 3. Column one lists the OTI course number and title, column two lists the suggested courses that should be given face-to-face, and column three includes the suggested courses that may be given using technology as the delivery method.

Table 3

Suggested Instructional Delivery Method

OTI Course Number/title	Which course should be given face-to-face?	Which course may use technology?
OSHA 1000 Initial Compliance Course	C/M/R/N	
OSHA 1410 Insp Techniques and Legal Aspects		C/M/R/N
OSHA 1020 Basic Accident Investigation		C/M/R/N
OSHA 3090 Electrical Standards		R/N
OSHA 3010 Excavation, Trenching and Soil	C/M/R/N	
OSHA 3080 Scaffolding	C/M/R/N	
OSHA 2040 Machine Guarding		R/N
OSHA 1210 Intro to Ind Hygiene for Safety Personnel		C/M/R/N
OSHA 2080 Cranes and Materials Handling	C/M/R/N	
OSHA 1520 Effective Written Communication		C/M/R/N
OSHA 2070 Fire Protection and Life Safety		R/N
OSHA 2200 Industrial Noise		R/N
OSHA 2210 Principles of Industrial Ventilation		R/N
OSHA 2260 Permit Required Confined Spaces		R/N
OSHA 3030 Concrete Forms and Shoring	C/M/R/N	
OSHA 3040 Power Press Guarding	C/M/R/N	
OSHA 3070 Sawmill and Logging Safety	C/M/R/N	

EXPENDITURES

In order to calculate all training expenditures for one participant at each region to plan for cost reductions, each cost component of the training will be tabulated beginning with the surveyed OTI courses taken and registration fees. Table 4 lists each requisite course taken at the OTI site and registration cost respectively. Appendix D lists all course descriptions for these. The first column contains the OTI course number and title, and the second column contains the registration fee for each course.

Table 4

OTI Courses and Registration Fees

OTI Course number and title	OTI Registration Fee
OSHA 1410 Inspection Techniques and Legal Aspects	\$576.00
OSHA 1020 Basic Accident Investigation	\$576.00
OSHA 3090 Electrical Standards	\$736.00
OSHA 3010 Excavation, Trenching and Soil Mechanics	\$736.00
OSHA 3080 Scaffolding	\$896.00
OSHA 2040 Machinery and Machine Guarding	\$1,312.00
OSHA 1210 Intro to Industrial Hygiene for Safety Personnel	\$1,536.00
OSHA 2080 Cranes and Materials Handling	\$576.00
OSHA 1520 Effective Written Communication	\$576.00
OSHA 2070 Fire Protection and Life Safety	\$576.00
OSHA 2200 Industrial Noise	\$576.00
OSHA 2210 Principles of Industrial Ventilation	\$576.00

Table 4 cont.

OTI Courses and Registration Fees

OTI Course number and title	OTI Registration Fee
OSHA 2260 Permit Required Confined Spaces	\$576.00
OSHA 3030 Concrete Forms and Shoring	\$800.00
OSHA 3040 Power Press Guarding	\$576.00
OSHA 3070 Sawmill and Logging Safety	\$1,536.00
OSHA 1050 General Industry Standards	\$1,536.00
OSHA 2000 Construction Standards	\$1,536.00

AIRFARE COST ESTIMATE

Another significant component of the expenditure tabulation is the airfare cost estimate because it will bring forward the total amount invested in the CSHO Apprenticeship Program in DOLI. Table 5 show this component of costs estimates of airfares to the O'Hare International Airport, the closest airport to the OTI site in Illinois. The first column establishes the region where the participant departed; the second column describes the airfare cost by lowest or highest. Columns three, four, five and six reflect the cost of the airfare based on the season of the year in which the participant traveled to take courses at OTI. Column seven estimated the average mean of the lowest rate and the highest rate. Column eight estimated the average cost of the lowest and the highest of the means from the column seven.

The highest cost of airfare to travel to the OTI site to take courses for the apprenticeship program was for the participant that traveled from the Roanoke region.

The second highest was the Central region, and then followed the Tidewater region. The lowest cost for airfare was for the Manassas region.

Table 5

Airfare Cost Estimates

Airfare to O'Hare International Airport Cost Estimate by Season						
Region	Fare Cost	Winter	Spring	Summer	Fall	Mean
Central	Lowest	332	337	289	274	401
	Highest	338	341	289	274	407
Manassas	Lowest	231	231	261	221	286
	Highest	231	231	261	221	286
Roanoke	Lowest	419	409	449	409	521
	Highest	429	419	459	419	534
Tidewater	Lowest	301	305	279	258	366
	Highest	317	305	337	259	382

LODGING, MEALS, AND INCIDENTALS EXPENSES

The allowable expenditure for the lodging, meal, and incidental was found in the State Travel Regulations that all Commonwealth employees need to follow. Each expense is listed per day and the average of days that each participant stayed at the hotel close to the OTI site was five days. The allowable out of state hotel rate for Illinois established was \$187.00 and the allowable meals and incidental expenses for each day was \$71.00. Final tabulations will encompass the cost of lodging plus the meals and incidentals expenses, multiplied by the average number of days of each trip, which was five. The result of this formula then was multiplied by the amount of trips taken.

EXPENSE CALCULATIONS

Central Region

Based on the information extracted from the survey, the Central Region participated in three courses listed in the survey at the OTI site and one not listed in the survey for a total of four trips taken to the OTI site to complete the CSHO Apprentice program. The average cost for the four courses was \$4,544.00. The average cost for the four round trips from Richmond International Airport to O'Hare International Airport was \$1,616.00. Lodging was added to the meals and incidentals allowed and were calculated on an average of five days stay, multiplied by the amount of four trips, and in this case the Central Region incurred in \$5,160.00. The grand total of OTI registration, airfare, lodging, meals and incidentals for the Central Region were \$11,320.00. Transportation between the airport to the hotel and the OTI site was provided free of charge.

Manassas Region

Based on the information extracted from the survey, the Manassas Region participated in two courses listed in the survey at the OTI site and one not listed in the survey for a total of three trips taken to the OTI site to complete the CSHO Apprentice program. The average cost for the three courses was \$3,648.00. The average cost for the three round trips from Reagan International Airport to O'Hare International Airport was \$858.00. Lodging was added to the meals and incidentals allowed and were calculated on an average of five days stay, multiplied by the amount of three trips, and in this case the Manassas Region incurred in \$3,870.00. The grand total of OTI registration, airfare,

lodging, meals and incidentals for the Manassas Region were \$8,376.00. Transportation between the airport to the hotel and the OTI site was provided free of charge.

Roanoke Region

Based on the information extracted from the survey, the Roanoke Region participated in 12 courses listed in the survey at the OTI site and one not listed in the survey. Three of the courses were taken on the same trip for a total of ten trips were taken to the OTI site to complete the CSHO Apprentice program. The average cost for the thirteen courses was \$11,008.00. The average cost for the ten round trips from Roanoke International Airport to O'Hare International Airport was \$5,280.00. Lodging was added to the meals and incidentals allowed and were calculated on an average of five days stay, multiplied by the amount of 10 trips, and in this case the Roanoke Region incurred in \$12,900.00. The grand total of OTI registration, airfare, lodging, meals and incidentals for the Roanoke Region were \$29,188.00. Transportation between the airport to the hotel and the OTI site was provided free of charge.

Tidewater Region

Based on the information extracted from the survey, the Tidewater Region participated in eight courses listed in the survey at the OTI site and one not listed in the survey. A total of nine trips were taken to the OTI site to complete the CSHO Apprentice program. The average cost for the nine courses was \$8,480.00. The average cost for the nine round trips from Norfolk International Airport to O'Hare International Airport was \$3,366.00. Lodging was added to the meals and incidentals allowed and were calculated on an average of five days stay, multiplied by the amount of nine trips, and in this case the Tidewater Region incurred in \$11,610.00. The grand total of OTI registration, airfare,

lodging, meals and incidentals for the Tidewater Region were \$23,456.00. Transportation between the airport to the hotel and the OTI site was provided free of charge.

Table 6 represents an estimate of expenditures by region for the courses taken at the OTI site discussed previously. It includes registration fees, airfare, lodging, meals and incidentals expenditure for each region. It also includes a grand total for all regions studied.

Table 6

CSHO training expenditure estimate for three-year period

Expenditure Estimate for CSHO training At the OTI site Over a Three year period				
Region	Central	Manassas	Roanoke	Tidewater
OTI Registration fee	\$4,544.00	\$3,648.00	\$11,008.00	\$8,480.00
Airfare Average Cost	4 trips	3 trips	10 trips	9 trips
	\$1,616.00	\$858.00	\$5,280.00	\$3,366.00
Lodging, meals and incidentals	\$5,160.00	\$3,870.00	\$12,900.00	\$11,610.00
Total of Expenditures per Region	\$11,320.00	\$8,376.00	\$29,188.00	\$23,456.00
	Overall Expenditures		\$72,340.00	

SUMMARY

In this chapter, the findings of the survey instrument are presented. These findings offer a detailed description of the courses taken by each of the four regions to complete the CSHO Apprentice program. Specifically the courses were taken at the OTI site and the courses taken on the same trip. The findings also discussed which courses were encouraged to be taken face-to-face and which courses can be technologically delivered.

A percentage overview of class participation was evaluated in Table 2, to see which courses have a high rate of participation. Thereafter, the registration fee for each course was detailed in Table 3. Airfare cost estimates were calculated by region flying into O'Hare International Airport and an average mean was calculated for each region as well. Lodging, meals, and incidentals were tabulated as well and all costs for each segment of the research objectives was established.

Then the researcher proceeded to calculate each region by establishing the amount of courses taken and the total of registration fee, plus the amount of trip taken to the OTI site multiplied by the average obtained from Table 4, to include the cost for meals and incidentals. Thereafter a total was given by region and a grand total for the CSHO training of four participants of each region, which can be seen in Table 6. The findings are the basis of the summary, conclusions, and recommendations found in the next chapter. Conclusions will be drawn based on the data collected and recommendations of alternate resources will be offered in the next and final chapter.

CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

The purpose of this chapter was to summarize the chapters, state conclusions based on the data collected, and offer recommendations based on the study.

SUMMARY

Currently there is a high demand to acquire new knowledge at a faster pace to fulfill the need of more skilled workforce. As a result more companies are developing training apprenticeship programs to rebuild the current economy more with talented skilled workers with a minimal cost. As Gordon (2009) stated, developing a skilled talented workforce will become a U.S. top economic challenge because of the economic post recession struggles. Therefore, innovative ways of training need to be implemented.

With an innovative approach of disseminating instruction, the apprentice program at DOLI can benefit more competitively by becoming a hub of information for agencies, businesses, and public at large. By establishing the apprentice program in Headquarters and creating online products, revenue can be saved and benefit the agency overall. The main goal should be to shift the expenditure of the apprentice program and focus on retaining revenue for the agency. Therefore this research was designed to seek ways to reduce expenditures in the Compliance Safety and Health Officer's Apprenticeship program at Virginia Department of Labor and Industry.

CONCLUSIONS

The following conclusions are made based on the responses of the participants in this research. The survey indicated that all participants were favorable to establishing a program in the Headquarter facilities in Richmond that will model the OTI program. The

data reflected positive feedback and encouragement to this particular innovation. Using the data, conclusions can be made based on the three research objectives established for this study.

Research Objective 1 was to identify which courses of the CSHO Apprentice program can be technologically delivered with the same outcome. Out of the 17 courses, 100% of the participants identified four courses and 50% identified six courses. Overall, of the average percent of students surveyed, 75% felt that 10 of the courses can be technologically delivered.

Research Objective 2 of this research was to identify which courses of the CSHO apprentice program can be given at the Headquarter site with the same outcome. Out of the four regions 100% of the participants stated that all courses could be developed at the Headquarter site with the same outcome.

Research Objective 3 was to calculate all training expenditures of one participant at each region to plan for cost reductions. Based on the data collected an average of cost was calculated for each region. Each region had a different set of circumstances, therefore the totals varied. The Central Region spent \$11,320.00; the Manassas Region spent \$8,376.00; the Roanoke Region spent \$29,188.00 and the Tidewater Region spent \$23,456.00. The grand total that the DOLI invested in the Apprentice program over a three-year period to train four CSHO's was \$72,340.00. The region with the highest expense was Roanoke, followed by the Tidewater region. The two lowest expenditures were from Central and Manassas region, travel distance varied the cost as well.

RECOMMENDATIONS

This study was designed to look at the cost of the Apprenticeship program for expense reduction with the integration of different venues such as distance education or perhaps an on-site trainer who is certified to teach all OTI courses locally. By doing so, the expenditures can be shifted into revenue for DOLI in the sense that participants will be going to Headquarters for training rather than traveling to OTI. In today's work environment of constant change in technology has created a demand for different methods of delivery and an implementation of a program, as this one can be very beneficial for the apprenticeship program.

Based upon the findings presented, professional and personal observations in each region of DOLI, and the conclusion stated above, this researcher submits the following recommendations:

- When possible, hire individuals with background or experience to the skills needed in a CSHO to eliminate the expenditures incurred for training.
- Compare costs of training at OTI versus in-house and technological delivered options.
- Survey the cost to establish a program at Headquarters that follows the same model of the OTI site with an on-site instructor that is certified to teach all OTI courses, which could potentially be shared with neighbor states.
- Mobilize business and industries throughout Virginia to promote training awareness and establish partnerships to create possible scenarios in the apprenticeship program that will enable hands-on training and plant tour with opportunities to see equipment in operation.

- Develop a plan of methods of delivery in the face-to-face and technologically delivered courses that have a higher percentage rate of participation from the apprentice program.
- Team up with an instructional designer to create the training modules needed based on the courses with higher participation, which may become starter courses for the Headquarters apprenticeship program.
- Establish a knowledge center on DOLI's web page in which participants can gain access to the modules of the apprentice program.
- Establish a knowledge center on DOLI's web page in which businesses may access training modules and serve as outreach to business and industries while promoting employee training so that accidents and fatalities in the workplace diminish.

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APPENDIX A

CSHO Apprenticeship Program Related Instruction at the OTI Site

General Instructions: Answers will be identified as the region they are originating from. This survey is directly related to a Master's degree requirement for Old Dominion University. Please complete the survey, by checking the appropriate box. You may return this survey via e-mail to mlope021@odu.edu; if you have any questions please contact: Marie Lopez at 757-561-3306.

OTI Course Number/title	Which of these courses did you take to complete the program?	Which of these courses did you take at the OTI site?	Which courses did you take in the same trip?	Which course should be given face-to-face?	Which courses may be given using technology as the delivery method?
OSHA 1000 Initial Compliance Course					
OSHA 1410 Inspection Techniques and Legal Aspects					
OSHA 1020 Basic Accident Investigation					
OSHA 3090 Electrical Standards					
OSHA 3010 Excavation, Trenching and Soil Mechanics					
OSHA 3080 Scaffolding					
OSHA 2040 Machinery and Machine Guarding					
OSHA 1210 Intro to Industrial Hygiene for Safety Personnel					
OSHA 2080 Cranes and Materials Handling					
OSHA 1520 Effective Written Communication					
OSHA 2070 Fire Protection and Life Safety					
OSHA 2200 Industrial Noise					
OSHA 2210 Principles of Industrial Ventilation					
OSHA 2260 Permit Required Confined Spaces					
OSHA 3030 Concrete Forms and Shoring					
OSHA 3040 Power Press Guarding					
OSHA 3070 Sawmill and Logging Safety					

APPENDIX B

Name
Address
City, State, Zip Code

April 14, 2010

Dear _____:

I am a graduate student in the Occupational and Technical Studies Program at Old Dominion University. Previously to coming to work at Old Dominion University, I had the privilege of working with the Department of Labor and Industry (DOLI) at the Headquarters. I became interested in the programs and services the agency provided to the constituency, particularly the Apprenticeship program at the Safety and Health Division. I was more interested in the fact that OTI was the only provider for the program and wanted to create awareness that there might be other methods of instructional delivery that can benefit the agency as well as the apprentice.

I contacted Assistant Commissioner, Bill Burge to request names of program completers. He was very kind to forward your information so I can work on my research project. The title of the research study is "Compliance Safety and Health Office Apprenticeship Program Expenditure Analysis".

Please take 10 minutes to answer this survey. All responses will remain confidential and all completed data will be used for educational purposes only. After responses have been tabulated all surveys will be destroyed. You may return the survey in the self-addressed stamped enveloped by _____.

If DOLI is interested in the results of this research study, I would be happy to provide the data upon request. I can easily be reached at mlope21@odu.edu. Many thanks for your prompt response and for your feedback in this survey.

Very truly,

Marie Lopez, Graduate Student
Old Dominion University

APPENDIX C

Name
Address
City, State, Zip Code

April 14, 2010

Dear _____:

A week ago, you should have received a survey titled: "CSHO Apprenticeship Program Related Instruction at the OTI Site". If you have already completed and mailed your response, please disregard this letter. I truly appreciate your promptness on that respect.

If by any chance you have not been able to complete and return, please do so this week. I need your response by _____.

Once again, many thanks for your assistance in this graduate research study.

Very truly,

Marie Lopez, Graduate Student
Old Dominion University

APPENDIX D

OTI Course number/title	OTI Course Description
OSHA 1410 Inspection Techniques and Legal Aspects	This course covers OSHA policies, procedures and standards of inspection techniques and legal aspects of inspections. Examples of cases will be discussed and special emphasis will be placed on those areas that are prone to litigations and court hearings.
OSHA 1020 Basic Accident Investigation	This course discusses basic safety and health hazards in the workplaces and to effectively assist in accident investigations. The course features a mock accident investigation and provides report examples of such investigations.
OSHA 3090 Electrical Standards	This course is designed to explain safety standards. Topics include: cord-plug connected equipment, assured equipment grounding program, ground fault circuit interrupters, and portable generators.
OSHA 3010 Excavation, Trenching and Soil Mechanics	This course focuses on OSHA standards and on the safety aspects of excavation and trenching. Students are introduced to practical soil mechanics and its relationship to the stability of shored and unshored slopes and walls of excavations. Types of shoring, soil classification testing methods are demonstrated, allowing students to use instruments such a penetrometers, torvane shears, and engineering rods.
OSHA 3080 Scaffolding	This course focuses on the safety aspects of scaffolding and current OSHA requirements. The students are introduced to basics of scaffolding operations from installation to dismantling. Topics include supported and suspended scaffolds, aerial lifts, and the interpretation of related standards. Installation and dismantling methods are demonstrated.
OSHA 2040 Machinery and Machine Guarding	This course focuses on the hazards associated with various primary types of machinery and the control of hazardous energy sources (lockout/tagout). The course focuses on hazards created by mechanical options and actions, point of operation, and other machinery processes. Hands-on training institute's laboratories and plant tours provide opportunities to see equipment in operation.
OSHA 1210 Intro to Industrial Hygiene for Safety Personnel	This course covers industrial hygiene practices related to OSHA regulations and procedures. Topics include permissible exposure limits, OSGHA health standards, respiratory protection, engineering controls, hazard communication, OSHA sampling procedures and strategy, workplace health program elements, and other industrial hygiene topics.
OSHA 2080 Cranes and Materials Handling	This course prepares students to inspect various types of overhead cranes, hoists, and powered industrial trucks used in general industry. Also issues concerning overhead and gantry cranes, wire rope, slings, and crane inspection and maintenance procedures, according to appropriated OSHA and ANSI standards.

OTI Course number/title	OTI Course Description
OSHA 1520 Effective Written Communication	This course provides students with tools on effective written communication that will help any investigator understand key elements of the investigation-taking place. Topics discussed are all parts of the reports needed, and key
OSHA 2070 Fire Protection and Life Safety	This course is designed to cover OSHA standards related to fire protection and life safety. Personal protective equipment, the use, selection, care and maintenance of the fire equipment used to protect employees. Discussions of various types of equipment and their limitations will also be covered.
OSHA 2200 Industrial Noise	This course is designed to cover OSHA's standards related to industrial noise and personal protective equipment. The use, selection, care and maintenance of the equipment to protect employees. Discussions of various types of equipment and their limitations will also be covered.
OSHA 2210 Principles of Industrial Ventilation	This course is designed to cover OSHA's industrial ventilation standards. The necessary steps for selection, proper use, and care of ventilation in the workplace to ensure air quality, quantity and flow of breathing air in businesses and industries.
OSHA 2260 Permit Required Confined Spaces	This course discusses the requirements of OSHA permit-required confined space standard 29 CFR 1910.146. It covers scope and definitions; general requirements; permit space program; training requirements; and employee roles and rescue.
OSHA 3030 Concrete Forms and Shoring	This course introduces the student to principles of forms and shoring and the quality of concrete, hot and cold weather placing practices, and inspection procedures. Topics are relevant to OSHA standards, curing of concrete, form removal, and standards on sampling concrete. The session includes laboratories on making concrete, testing hardened concrete, reinforced concrete, pre- and post stressing of concrete, lift-slab construction, and reading concrete construction blueprints and shoring plans.
OSHA 3040 Power Press Guarding	This course focuses on the specific requirement of 29 CFR 1910.217, Mechanical Power Presses. Par revolution and full revolution clutch mechanisms are discussed in detail, with related hazards and guarding methods. Students operate presses in the Institute laboratory, determine appropriate safeguards, and analyze press operations
OSHA 3070 Sawmill and Logging Safety	This course introduces the basic components of sawmill operations, from log handling to finished products. Hazards, proper controls, and related OSHA standards are discussed for each operation. Topic such as materials handling electrical hazards, machine guarding, and health hazards are covered.

OTI Course number/title	OTI Course Description
OSHA 1050 General Industry Standards	This course covers OSHA policies, procedures, and standards as well general industry safety and health principles. Topics include scope and application of the OSHA standards. Special emphasis is placed on those areas that are the most hazardous, using OSHA standards as a guide.
OSHA 2000 Construction Standards	This course covers OSHA policies, procedures, and standards, as well as construction safety and health principles. Topics include scope and application of the OSHA construction standards. Special emphasis is place on those areas that are most hazardous, using OSHA standards as a guide.