

Measuring Facilitation Methods Used in the Fire Service

Joshua Williams

Colorado State University

March 1, 2015

EDAE 600 Introduction to Research Methods

Dr. Jeffrey M. Foley

Abstract

This study evaluated the current training methods used in the fire service. Understanding these methods will allow fire service professionals to choose the most appropriate method leading to better skill retention, increased knowledge, and an increase in learning transfer among firefighters. The results of this quantitative study suggest that firefighters need to be placed in a position that forces them to use their skills. Conducting training this way allows them to remember specific skills and allows them to make mistakes in a controlled environment. Over 90% of the individuals surveyed in this study, said they wanted to demonstrate their skill set through a hands-on practical test. Although, all of the current facilitation methods used in the fire service are important, there needs to be a focus on hands-on training.

Introduction

Learning and training is a constant task of firefighters. Every day firefighters train and try to better prepare themselves for calls and challenges they may face. These men and women need to be prepared and know how to respond to a wide range of emergencies. Fire service instructors need to understand how to properly facilitate trainings and how to provide their firefighters with the tools to succeed. By selecting the most appropriate facilitation method instructors will be able to better prepare their firefighters to serve their communities. The main focus of this study is to research the current facilitation methods used and to increase knowledge, skill retention, and learning transfer among firefighters. The main research question that will guide this study is:

- What type of facilitation method allows for highest levels of learner retention among firefighters?

Following a qualitative method of inquiry members of the Frederick-Firestone Fire Protection District were used as a study sample. A questionnaire was sent out to the district in order to gain raw data. The main purpose of this study was to figure out how to increase learner retention among firefighters by selecting the most appropriate facilitation methods. Research will examine current methods used, and will focus on how the learning environment, the instructor, and the types of trainings completed assist the learner in skill mastery and retention

Area of Focus

By better understanding the different facilitation methods currently used in the fire service, fire service instructors will be able to adapt their teaching styles to their students, which will allow them to better serve their learners. This research project will

focus on identifying and measuring the efficacy of different methods of facilitating trainings within the fire service.

Problem Statement

Research seeks to identify and examine the different styles of instruction used in the fire service. The purpose of this study is to systematically increase knowledge, skill retention and increase learning transfer among fire firefighters by selecting the most appropriate facilitation method. This study will focus on but is not limited to: lectures, computer based trainings, distance education, skills demonstration, live-fire simulations, case studies, and mentorship. By utilizing the information from this study fire instructors will increase learner retention among firefighters, resulting in them being better prepared to respond to emergency situations.

Research Questions

The research question that will guide this study is:

What type of facilitation method allows for highest levels of learner retention among firefighters?

Below is a list of sub-questions that will aid in the research:

- What allows firefighters to remember a specific skill?
- What role does the learning environment play in knowledge retention and skill mastery?
- How do the instructor's facilitation methods assist in learner retention?
- Do students learn more in the classroom, on skills days, or during scenario trainings?

Understanding how to train firefighters efficiently is a vital key of the fire service. Using the above research questions, this study will figure out how to increase learner retention among firefighters. The results of this study will be a good resource for instructors and will save departments money.

Background

Firefighters constantly train to be prepared for the next call. They never know what that call may be, and that is why it is so important for firefighters to have such a large skill set. Understanding how to increase knowledge, skill retention, and learning transfer among firefighters by selecting the most appropriate facilitation method is vital. These individuals learn a lot, and need to retain all of the information. This background is broke into three different sections, firefighter training standards, current facilitation methods used in the fire service, and learning styles.

Firefighter Training Standards

Across the nation there is not a universal federal requirement for firefighting training. It is up to each state, and they are responsible for creating and developing their own certification program. The Colorado Division of Fire Prevention and Control (CDFPC) manage the certification process for Colorado firefighters. The general purpose of the firefighter certification program is to measure the level of skills, knowledge, and abilities of firefighters and emergency responder (Division of Fire Prevention and Control, 2012). National Fire Protection Agency (NFPA) is an organization that creates and maintains minimum standards and requirements for fire training, suppression activities, fire prevention, and equipments (Division of Fire Prevention and Control, 2012). NFPA has different standards according to different certification levels. Colorado Division of Fire

Prevention and Control uses the NFPA standards as a basis of exam and state certification testing processes. There are a total of 28 certifications that can be obtained by the Colorado Division of Fire Prevention and Control, below is a list of a few of the certification levels offered (Division of Fire Prevention and Control, 2012):

- Fire Fighter I
- Fire Fighter II
- Fire Officer I
- Fire Officer II
- Fire and Emergency Services Instructor I
- Fire and Emergency Services Instructor II
- Driver Operator
- Driver Operator Pumper
- Driver Operator Aerial
- Hazardous Material Operations.

Understanding the different levels of certification offered by the State of Colorado will allow fire service instructors to focus on their learners. The same instructor will teach some certification programs but many will not. On average firefighters will not maintain all state certifications offered. Each training program and instructor needs to adjust his or her facilitation methods and learning environment to cover the standards as addressed by NFPA.

An example of the initial certification requirements to obtain a Fire Fighter I certification from the Colorado Division of Fire Prevention and Control Certification Policy and Procedure Manual are below (Division of Fire Prevention and Control, 2012):

- 9.3.1.1: Meet requirements in NFPA 1001
- 9.3.1.2: Must be Colorado certified minimally at Hazardous Materials Operations NFPA 472
- 9.3.1.3: Pass Written Examination
 - 70% of 100 question examination
- 9.3.1.4: Pass Practical Examination
 - Mandatory and Randomly selected Job Performance Requirements (JPRs)
 - 100% of practical examination
- 9.3.1.5: Pass Live Burn Practical Examination
 - Randomly selected JPR
 - 100% of practical examination
- 9.3.1.6: Written and practical examinations are obtained from the CDFPC.

The issue is that it is up to each specific district or department to train and maintain certification levels. National Fire Protection Agency (NFPA), the United States Fire Administration (USFA), and the United States Department of Homeland Security (DHS) conducted a needs assessment study and found that an estimated 233,000 firefighters are involved in structural firefighting but lack formal training in those duties (NFPA, 2002). Most of these firefighters are volunteers who serve communities with a population of less than 2,500. These are staggering numbers, and the fire service in general needs to figure out how to reduce these numbers and get their men and women trained up to recommended standards. Fire instructors need to train their personnel with the most effective type of facilitation method that fosters learner retention. Through examination

of the common types of facilitation methods used in today's fire service this can be completed.

Facilitation Methods

This section seeks to identify and examine the different styles of instruction used in the fire service. The purpose of this study is to figure out how to increase learner retention among fire firefighters by selecting the most appropriate facilitation method. Prior to identifying the most appropriate type, a thorough understanding of current methods in use is needed. This section includes: lectures, computer based trainings, distance education, case studies, live-fire and practical exercise scenarios, and mentorship.

Lectures. This type of instruction is mainly used within the typical classroom setting. It allows for providing facts, regulations and rules, examples, clarifications, and definitions (Clausing, 2012). Lecture is a legitimate instructional method used by adult education practitioner (Galbraith, 2004). Here the instructor explains a topic through words and uses audiovisual aids as needed. It allows for students to ask questions, get clarification, and be shown examples. Lectures allow for one person to speak at a time and allow multiple learners to be lectured all at once. Use of computer generated slideshow presentations generally accompanies lectures. The environment needs be one where students feel safe and supported, where their abilities and life achievements are acknowledged and respected (Billington, 1996). A disadvantage of lecture is generally related to its misuse and overuse (Galbraith, 2004). This leads to the need and importance of a qualified instructor presenting the material.

Computer-based trainings (CBT). This type of instruction has been recently introduced into the fire service. There are many different types of computer-based trainings. Some trainings allow students to work at their own pace, while others are a simulation. CBT programs normally minimize interaction between the learner and the instructor (Clausing, 2012). During these programs the instructor is usually available to answer questions and guide trainings as needed. According to Adams (1999), there is a need for interactive computer-based simulation training for higher level chief and company officers. His research found that it is often too difficult to simulate complex incidents without the aid of a CBT program. One of the newest examples of CBT programs is the Blue Card Command Certification Program. This program is designed to train company and command officers how to standardize incident operations. This program is offered through online and in-class simulations trainings (About Blue Card, 2011).

Distance education. This instruction is a generic term for instruction that happens when the learner and instructor are in remote locations (Clausing, 2012). This type of instruction uses a medium such as the Internet to communicate between the instructor and other students in the course. There are many different courses and trainings that are presented in this fashion. An example of a distance education program that is designed for fire service personnel is the Fire and Emergency Services Administration Degree from Colorado State University. This is an online degree program and offers courses in key administrative areas. These areas include but are not limited to: financial management, personnel administration, emergency management, and program evaluation.

Case studies. This type of instruction is in constant use in the fire service. It is a way for instructors to look back at fire tactics and fire development in order to better prepare for the future. During Firefighter I Academy, students mainly study out of an International Fire Service Training Association (IFSTA) manual. At the beginning of each chapter there is a case study that relates to the information in that chapter. For example, at the beginning of the building construction chapter in *Essentials of Fire Fighting and Fire Department Operations*, the case study covers a fire where there was a building collapse and two firefighters lost their lives (Goodson, 2008). The instructor will normally start the course by having the students discuss why they felt the building collapsed, and what, if anything, could have been done to prevent it. At the end of the chapter they will revisit the case study. National Institute for Occupational Safety and Health (NIOSH) does investigations on all line of duty deaths. Through these investigations instructors are able to create case studies and drive home the real danger of firefighting to the new members in the service.

Live-fire and practical exercise scenarios. Simulations such as these are used in all fire academies and consistently throughout the fire service. This is a verbal and physical session that happens in a controlled environment such as a training facility. Trainees practice and repeat skills that have been introduced to them. These skills include deploying hand lines, throwing ladders, ventilation scenarios, and live-fire extinguishment. This type of training permits students to experience the situations and see the positive and negative results of their decisions in a controlled environment. An advantage of simulations is that feedback is immediate, this provides a built-in reward

system that encourages mass involvement (Galbraith, 2004). Simulations allow for realistic training environments.

Live-fire trainings are often studied for the effects it has on firefighters.

Physiological Strain of Firefighters Exposed To A Live Firefighting Exercise is study that was completed by Kyle Russel Barnes. His study focused directly on the effects of live-fire exercises on firefighters. This study proved that firefighters need to maintain a certain level of physical fitness. This is necessary in order to be safe and not be at risk for cardiovascular incidents while participating in this type of instruction (Barnes, 2009).

Mentorship. The process of mentorship places the learner under guidance of a more experienced firefighter. This senior firefighter will act as a tutor, guide, and motivator to the new member. Mentoring situations occur outside of the classroom, and often include on the job training. The aim of mentorship is to promote the development of the learner (Galbraith, 2004). During the mentorship, the mentor is able to guide the actions of the learner and is able to work with him or her one-on-one. This allows for good learner retention due to the welcoming learning environment that is often created. “Mentoring programs enhance management skills, improve productivity, and encourage diversity” (Clausing, 2012).

Understanding methods that are currently being used is needed to select the appropriate method of delivery. The instructor must match the learning styles of their students and give attention to both how the student learns and how they like to learn. The learning style is a way in which each person absorbs and retains the information or skills (Williamson, 2006).

Learning Styles

According to David Kolb there are four main learning styles: divergers, assimilators, convergers, and accommodators (Williamson, 2006). Accomodators for example, learn best from hands-on experiences. They prefer concrete experience, active participation, new experiences, and are willing to take risks (Williamson, 2006). Accomodators have the ability to carry out plans, adapt to new situations, and perform well in situations where a person must adapt to an immediate changing circumstance (Williamson, 2006). By understanding the learners style the instructor will be able to decide on the delivery method.

Robert McClafferty completed a study on the officer remediation training program for the District of Columbia Fire Department. The study sample consisted of low achieving company officers. His findings indicated that the officers were a diverse group of learners and their learning styles were not reached by the traditional lecture based education (McClafferty, n.d.) His research showed that 72 percent of low achieving officers at the District of Columbia Fire Department were tactile/kinesthetic learners (McClafferty, n.d.). At the time of the research project, the facilitation methods in place mainly focused on the classroom lecture. Fire service instructors need to understand their students learning style and make appropriate adjustments. Students who are taught with methods that matched their learning style have a 70 percent better success rate than those who are not (Williamson, 2006). It is also important to remember auditory learners perform poorly in classes where lectures are 90 percent of classroom instruction (Williamson, 2006).

Summary

The purpose of this background was to obtain a basic understanding of current Colorado firefighter training standards, to identify training facilitation methods that are currently in use within the fire service, and to get a basic knowledge of how fire service need to focus on the learners style adjust as needed. The methods listed above are currently in use and have been implemented in fire departments across the world. Through further examination of these methods, we will be able to provide better trainings for firefighters.

Rational

The overall research goal of this study is to increase knowledge, skill retention, and learning transfer among firefighters. How this goal can be completed is by identifying and measuring the efficacy of different methods of facilitating trainings within the fire service.

This research is important to the field because fire service personnel need to be prepared to answer the call. It doesn't matter the time of day, or the day of week. These individuals need to be trained and well prepared to face a wide range of emergencies. Across the nation there is a lack of trained firefighters. National Fire Protection Agency (NFPA), the United States Fire Administration (USFA), and the United States Department of Homeland Security (DHS) conducted a needs assessment study. The results are below: (NFPA, 2002)

- An estimated 153,000 firefighters are involved in structural firefighting but lack specific certifications. Again, most of these firefighters are volunteers who serve communities with a population of less than 2,500.

- An estimated 27% of fire department personnel who provide emergency medical services (EMS) lack formal training in those duties. Most of these individuals serve communities with a population less than 10,000.
- An estimated 40% of fire department personnel lack formal training in hazardous material response.
- An estimated 41% of fire department personnel lack formal training in wildland firefighting.
- An estimated 53% of fire department personnel who are involved in technical rescue service lack formal training in technical rescue.

This research is important because it's a firefighters job to be well trained and fully competent in their skill set. They need to know how to do their job, and they need to be able to properly train the newer members. Learning how to throw a ladder to a third story building for a victim rescue should not be learned for the first time at 2:00 am when a hotel is on fire. They need to have been prior trained on that skill, and have had the ability to practice it. That skill needs to be second nature, because when it matters the most they don't want to be learning such a vital skill for the very first time.

Methods

This study seeks to identify and examine the different styles of instruction used in the fire service. The purpose of this study is to figure out how to increase learner retention among firefighters by selecting the most appropriate facilitation method. By utilizing the information from this study we will increase learner retention among firefighters, resulting in them being better prepared to respond to emergencies within their communities.

The research question that is guiding this study is:

What type of facilitation method allows for highest levels of learner retention among firefighters?

Below is the list of sub-questions that will be used to guide research:

- What allows firefighters to remember a specific skill?
- What role does the learning environment play in knowledge retention and skill mastery?
- How do the instructor's facilitation methods assist in learner retention?
- Do students learn more in the classroom, or on the fire ground?

Sample Selection

The study sample will be all members of the Frederick-Firestone Fire Protection District (FFFPD). The Training Division is responsible for ensuring all line and administration members have adequate training in order to keep up with the growth of our district, and maintain both state and national level certifications. The Training Division operates under the Division of Life Safety. Captain Jim Klug is currently the officer in charge of the Training Division. He has been in this position since June of 2008. He gave me permission to send out a questionnaire to the FFFPD.

Quantitative Inquiry

The questionnaire is quantitative in nature. It contains both closed and open-ended questions. An advantage of using this type of questioning is that the predetermined closed-ended responses often net useful information to support theories and concepts in the literature (Creswell, 2015). The open-ended responses, allow the researcher to explore reasons for the responses to the closed-ended questions, and

identify comments the subjects may have that are beyond the responses of the closed-ended questions (Creswell, 2015). The questionnaire is broke into three different sections.

The first section of the questionnaire focused on the experience of the subject. In this section the participants were asked to indicate their employment status, number of years in the fire service, number of years with the FFFPD, and current certifications. This will help understand their specific experience level. In the fire service, firefighters often move between departments. That is why it is important to explore each subjects personal experience level to include number of years within the fire service.

The second section strictly contained closed-ended questions and focused directly on the subjects training experience. In the first two questions, the subjects were asked to identify the number of hours of fire training that were completed last month, and their preferred training environment. The only opened response allowed was at the end of question six. Here the subject could identify their preferred training environment if it was not one of the training environments that was presented earlier in the question. In the next two questions the subjects were able to select only one response, these questions focused on demonstration of learned skills, and type of instruction. The responses allowed in the final three questions in this section ranged from strongly agree to strongly disagree. These questions focused on how well the FFFPD provides training to the subject, and if the subject feels comfortable being a mentor to another member within the FFFPD.

The final section of the questionnaire consists of three open-ended questions. This section focuses on the opinions of the subjects. The first two questions asked the

subject to explain the part of firefighter training that he or she finds most beneficial and least beneficial. The last question asked the subject if they had any suggestions to make training more beneficial to them. This section is valuable because it allows the subject to expand on their needs and theories on the material. A drawback of the section is that there will be some short and some long responses, and this can be difficult to analyze (Creswell, 2015).

Data Collection

The questionnaire was sent out via FFFPD department email. It was formatted in a way to be completed and returned via email. This delivery type will be used if the subject does not mind returning it attached to their specific email account. If the subject wanted complete the questionnaire anonymously they were instructed to print it off and send it to me via interoffice mail. I also went to each station and left a stack on the stations kitchen table. Only the information on the questionnaire will be used in the research study, if the subject does send it back via email and not interoffice mail it will not change the data analysis.

Data Analysis

Data from the questionnaire will be compiled and put into an excel spreadsheet for review. Each question will then be analyzed and put into a scale. The Likert scale will be used to analyze questions five, six, and seven. The Likert scale has become common practice and illustrates theoretically equal intervals between options (Creswell, 2015). The final questions are opened ended questions and as stated earlier often difficult to analyze. The answers to this section will be grouped together with other similar answers and each will be examined separately.

Limitations

The main limitations of this research study are below:

- This study only represents the thoughts of the firefighters at Frederick-Firestone Fire Protection District
- This study does not focus on a volunteer department
- The population served by the FFFPD is high in comparison to the NFPA research.
- The results of the data cannot be generalized for the whole fire service.

Summary

The previous section described the different methods of research that are leading this study. The research questions guide the research and show what the study aims to prove. This section also showed how the study sample was chosen, how the data will be collected and analyzed, and described the limitations of the study.

Findings

The overall goal of this research project was to figure out what type of facilitation method allows for highest levels of learner retention among firefighters? A questionnaire was sent out to all members of the Frederick-Firestone Fire Protection District. A total of 21 questionnaires were completed and returned. The target response was 25. The response rate was low due to vacations, illness and other participation challenges.

The first section of the questionnaire contained questions one through four. This section focused on the experience of the subject. Question number one determined the employment status with the Frederick-Firestone Fire Protection District? Table 1 and Figure 1 represent the responses.

<i>Status</i>	<i>Responses</i>
<i>Career</i>	<i>17</i>
<i>Temporary Full Time (TFT)</i>	<i>2</i>
<i>Paid Part Time</i>	<i>1</i>
<i>Reserve</i>	<i>1</i>

Table 1. Firefighter Status With Department Findings

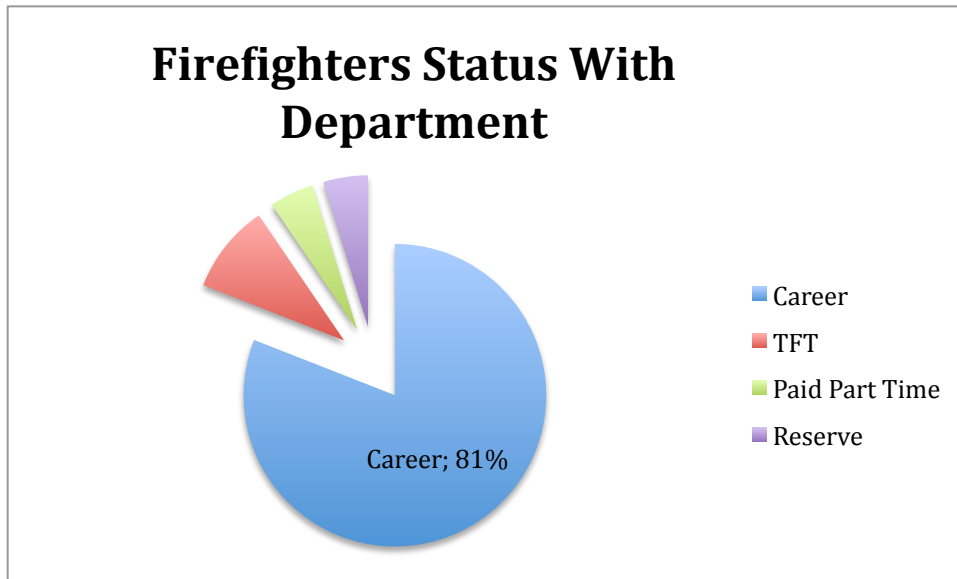


Figure 1. Firefighters Status With Department

Table 1 and Figure 1 shows the status of the subjects with the FFFPD. 81% of the subjects are career firefighters.

Table 2 and Figure 2 focus on question number two, it asked how many years of fire service experience the subject had.

Years	Responses
1-5 Years	3
6-10 Years	6

11-15 Years	8
16-20 Years	1
Over 20 Years	3

Table 2. *Years of Fire Service Experience*



Figure 2. *Years of Fire Service Experience*

Table 2 and Figure 2 show us that the majority of the subjects have six to 15 years of fire service experience.

Table 3 and Figure 3 provide response for question number three. This question identified how many years the subject has been employed at Frederick-Firestone Fire Protection District?

Length of Time Employed	Responses
0-1 Years	1
1-5 Years	6
6-10 Years	9

11-15 Years	4
16-20 Years	1

Table 3. *Length of Time Employed by FFFPD*

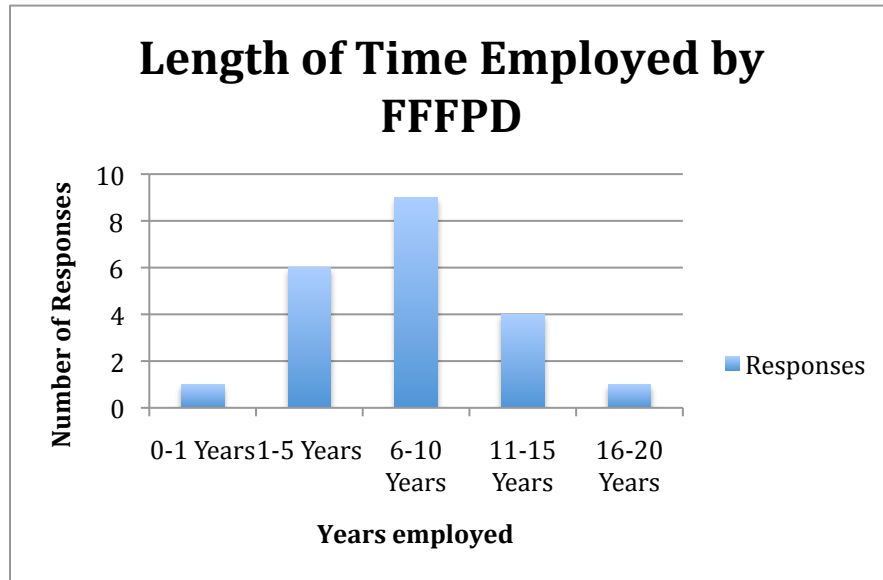


Figure 3. *Length of Time Employed by FFFPD*

Table 3 and Figure 3 shows the length of time that the subjects have been employed by the FFFPD. The majority of individuals have been employed for only six to 10 years.

Table 4 and Figure 4 focus on the next question. It asked the subject to list the current fire certifications they hold.

Current Certifications	Responses
Firefighter I	3
Firefighter II	18
DO Utility	1
DO Pumper	16
DO Aerial	3
HazMat Ops	13

HazMat Tech	4
Fire Instructor	13
Fire Investigator	1
Fire Inspector	1
Fire Officer	7
Tech Rescue	7
Swift Water Rescue	2
Red Card	9

Table 4. *Certifications of firefighters*

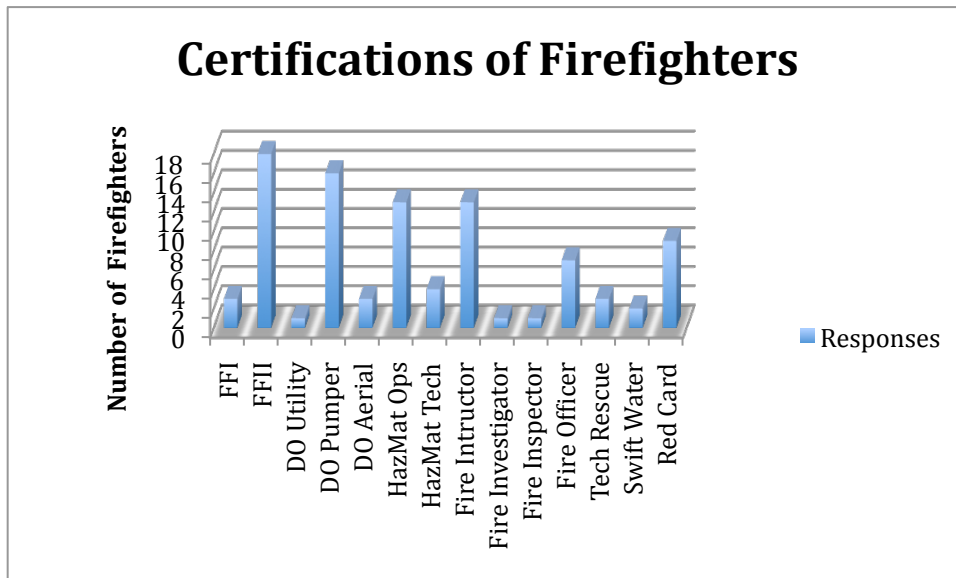


Figure 4. *Certifications of Firefighters*

Table 4 and Figure 4 shows the fire certifications that the subjects hold.

The second section of the questionnaire contained questions five through eleven.

This section contained closed-ended questions and focused directly on the subjects training experience. Table 5 and Figure 5 shows the results of question five, it asked the subjects how many hours of fire training they completed last month.

Hours of Fire Training	Responses
1-5 Hours	1
6-10 Hours	1
11-15 Hours	2
15-20 Hours	0
20-25 Hours	4
Over 25 Hours	13

Table 5. *Training Hours Completed Last Month*

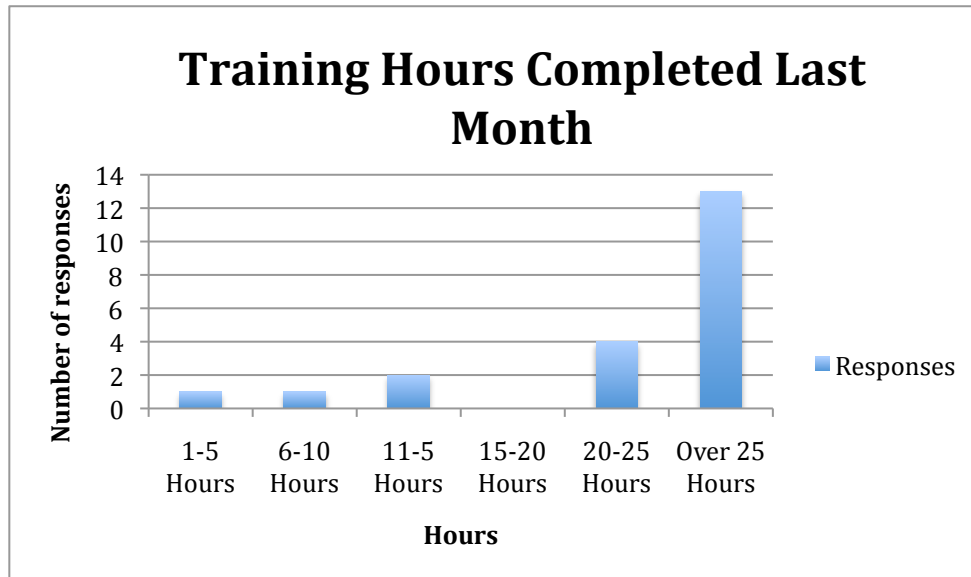


Figure 5. *Training Hours Completed Last Month*

Table 5 and Figure 5 shows how many hours of fire training the subjects completed last month.

Question six asked the subjects to read all items listed and rank the items on a scale of one to five with regards to their preferred fire training environment. The subjects used one as your least preferred training environment and five being their most preferred

training environment. Question six was broke into five different graphs for reviewing results.

Table 6 and Figure 6 focus on the classroom as the subjects preferred environment.

Ranking	Responses
1 – Least Preferred	4
2	5
3	11
4	1
5 – Most Preferred	0

Table 6. *Classroom as Preferred Environment*

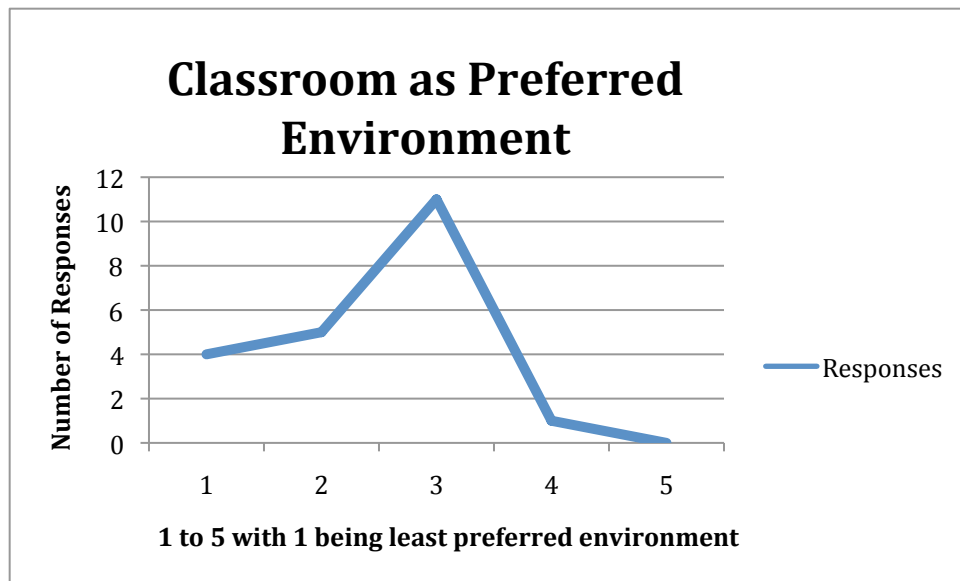


Figure 6. *Classroom as Preferred Environment*

The subjects ranked using the classroom as a preferred training environment on a scale of one to five. The subjects used one as their least preferred training environment

and five being their most preferred training environment. Ranking of a three was most prominent with 11 responses.

Table 7 and Figure 7 displays the results of using distance education / online instruction as the preferred environment.

Ranking	Responses
1 – Least Preferred	7
2	8
3	2
4	0
5 – Most Preferred	4

Table 7. *Distance Education/Online Instruction as Preferred Environment*

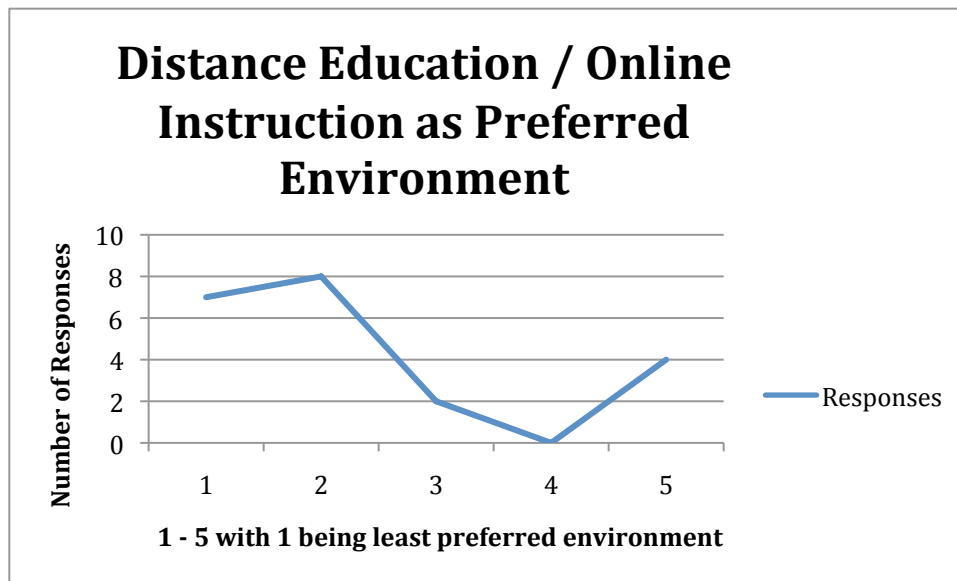


Figure 7. *Distance Education / Online Instruction as Preferred Environment*

The subjects ranked using distance education / online instruction as a preferred training environment on a scale of one to five. The subjects used one as their least preferred training environment and five being their most preferred training environment.

There was a low ranking for this type of environment. Most subjects ranked this environment as a one or two.

Table 8 and Figure 8 focus on using computer program (e.g. Blue Card Simulation) as the learners preferred environment.

Ranking	Responses
1 – Least Preferred	4
2	5
3	8
4	4
5 – Most Preferred	0

Table 8. *Computer Program (e.g. Blue Card Simulation) as Preferred Environment*

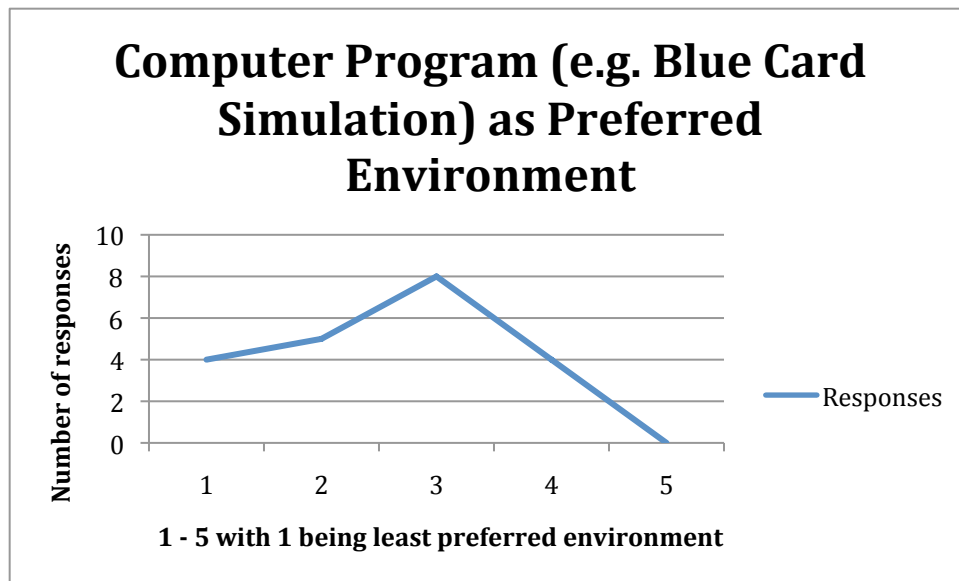


Figure 8. *Computer Program (e.g. Blue Card Simulation) as Preferred Environment*

The subjects ranked using computer program (e.g. Blue Card Simulation) as a preferred training environment on a scale of one to five. The subjects used one as their

least preferred training environment and five being their most preferred training environment. Ranking of a three was most prominent with eight responses.

Table 9 and Figure 9 show the response to asking the subjects if hands-on at fire station is the preferred training environment.

Ranking	Responses
1 – Least Preferred	1
2	3
3	1
4	12
5 – Most Preferred	3

Table 9. “Hands on” at Fire Station as Preferred Environment

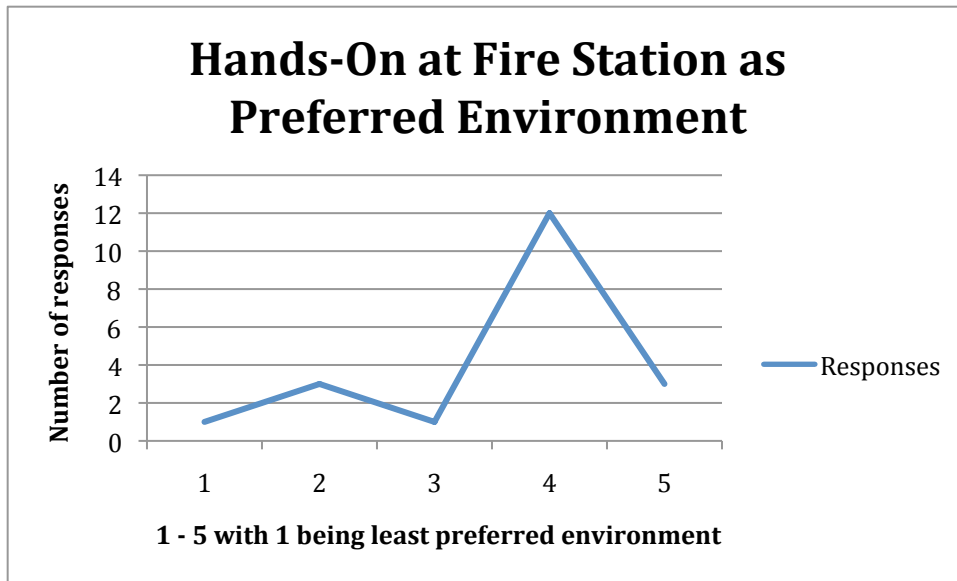


Figure 9. Hands-On at Fire Station as Preferred Environment

The subjects ranked using hands-on at the fire station as a preferred training environment on a scale of one to five. The subjects used one as their least preferred

training environment and five being their most preferred training environment. Ranking of a 4 was most prominent with 12 responses.

Table 10 and Figure 10 show the results to having the learner train hands-on at different location (e.g. training center) as preferred environment.

Ranking	Responses
1 – Least Preferred	3
2	1
3	0
4	1
5 – Most Preferred	16

Table 10. *Hands-On at Different Location (e.g. Training Grounds) as preferred*

Environment

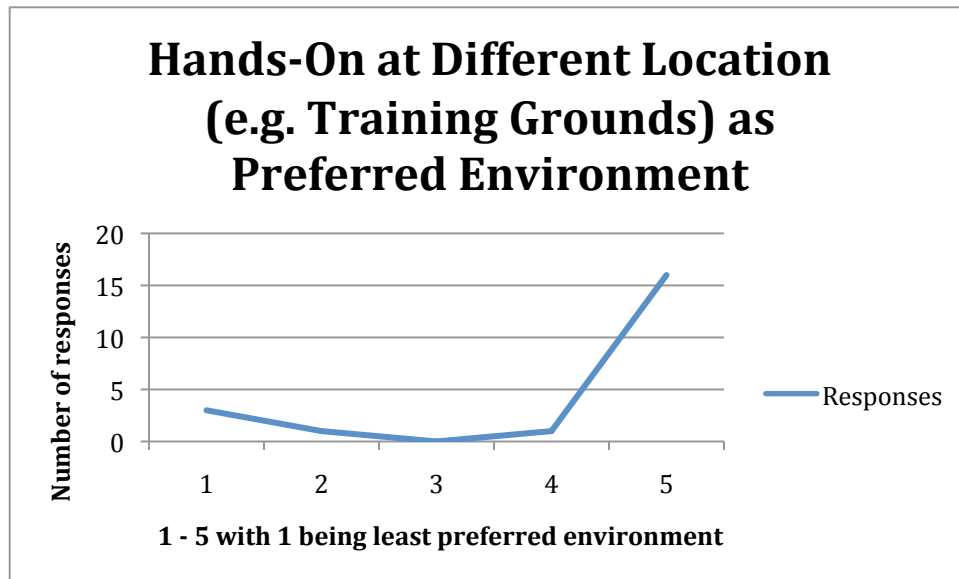


Figure 10. *Hands-On at Different Location (e.g. Training Grounds) as Preferred*

Environment.

The subjects ranked using hands-on at a different location (e.g. training grounds) as a preferred training environment on a scale of one to five. The subjects used one as their least preferred training environment and five being their most preferred training environment. Ranking of a five was most prominent with 16 responses.

The next question in the survey asked them to identify how they like to demonstrate the skills that they have learned in training. Table 11 and Figure 11 shows their responses.

Demonstration of Skills	Responses
Paper Test	1
Practical “Hands On” Test	19
Verbal Test	0
Computer Based Test	0
Tabletop Exercise Test	1

Table 11. *How to Demonstrate Skills*

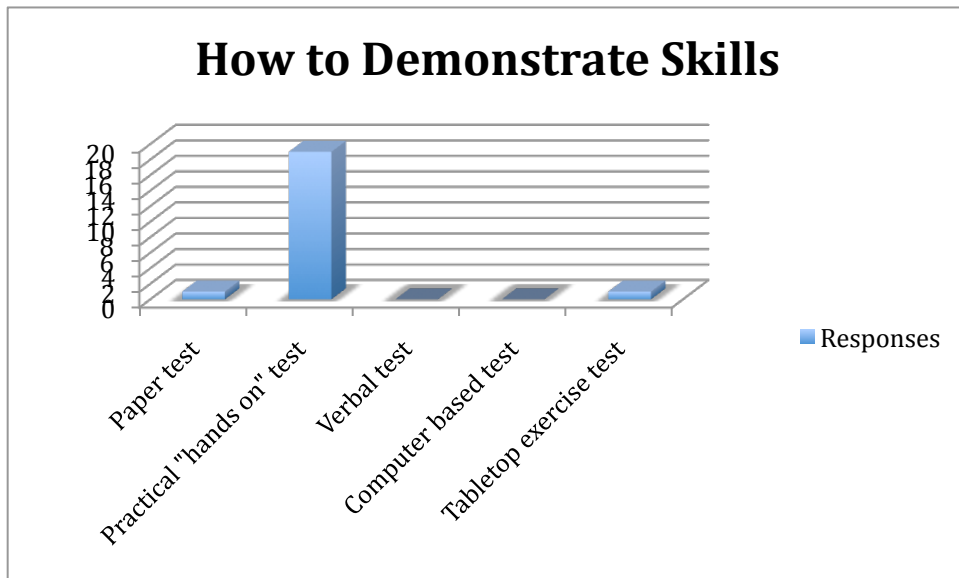


Figure 11. *How to Demonstrate Skills*

Table 11 and Figure 11 shows how the subjects like to demonstrate skills they have learned. The response of demonstrating the skills by using a practical “hands on” test was most prominent with 19 responses.

Table 12 and Figure 12 show the preferred method of instruction from the instructor as described by the learner.

Instruction Method	Responses
Physically Demonstrates	7
Verbally Describes	1
Shows a Video	0
Physically Involves Me	13

Table 12. Preferred Method From Instructor

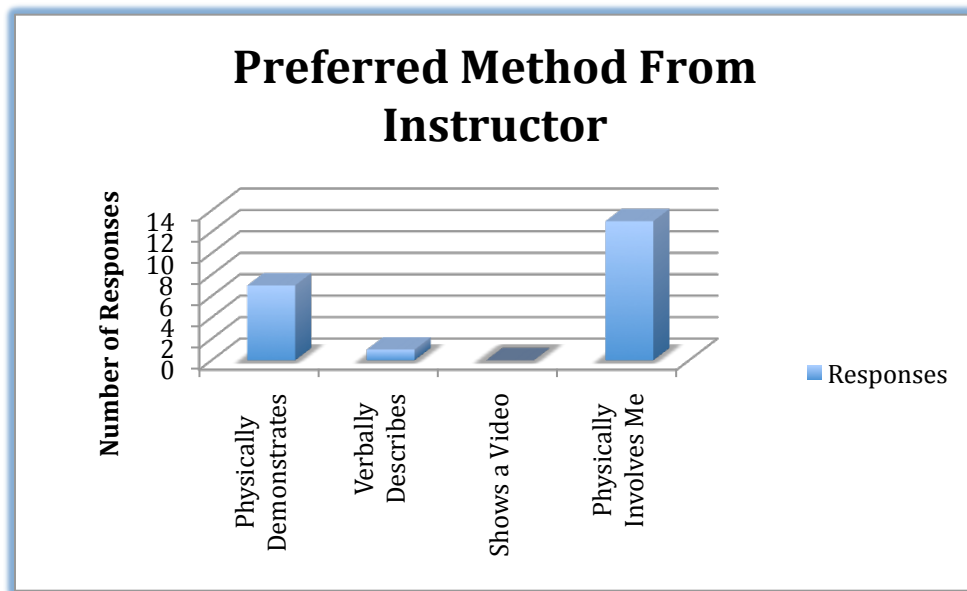


Figure 12. Preferred Method From Instructor

Table 12 and Figure 12 show us that the subjects enjoy when training involves them and is demonstrated to them.

The next question asked the subjects if they felt they are confident in their ability to perform their job proficiently. Table 13 and Figure 13 provide the responses.

Ability To Perform Job Proficiently	Responses
Strongly Agree	13
Agree	8
Disagree	0
Strongly Disagree	0

Table 13. *Ability to Perform Job Proficiently*

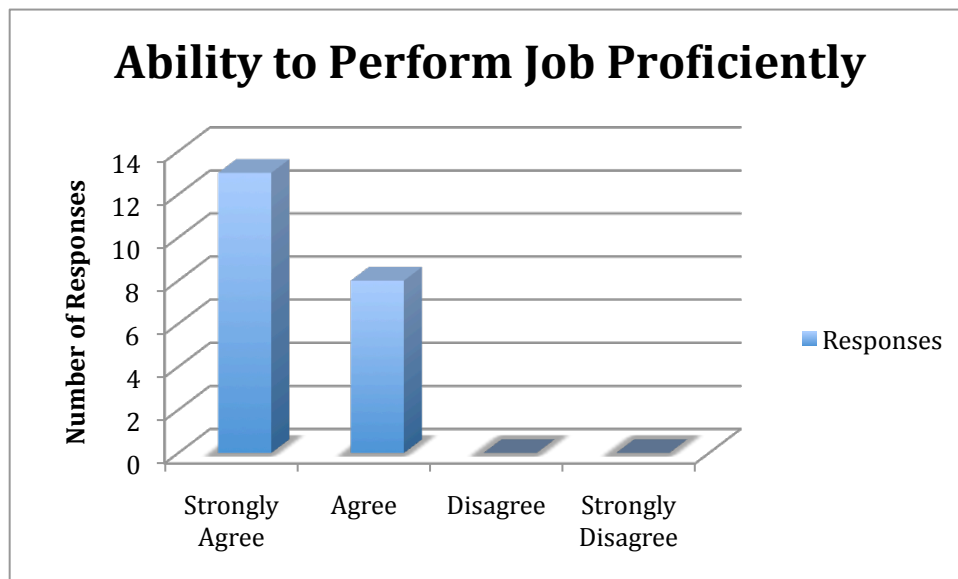


Figure 13. *Ability to Perform Job Proficiently*

Table 13 and Figure 13 shows that the members of FFFPD feel they have the ability to perform their job proficiently.

The subjects were asked if they felt the FFFPD provides them with adequate training to perform their job proficiently. The Table 14 and Figure 14 represent their responses.

Adequate Training from the FFFPD	Responses
----------------------------------	-----------

Strongly Agree	11
Agree	10
Disagree	0
Strongly Disagree	0

Table 14. *Adequate Training from the FFFPD*

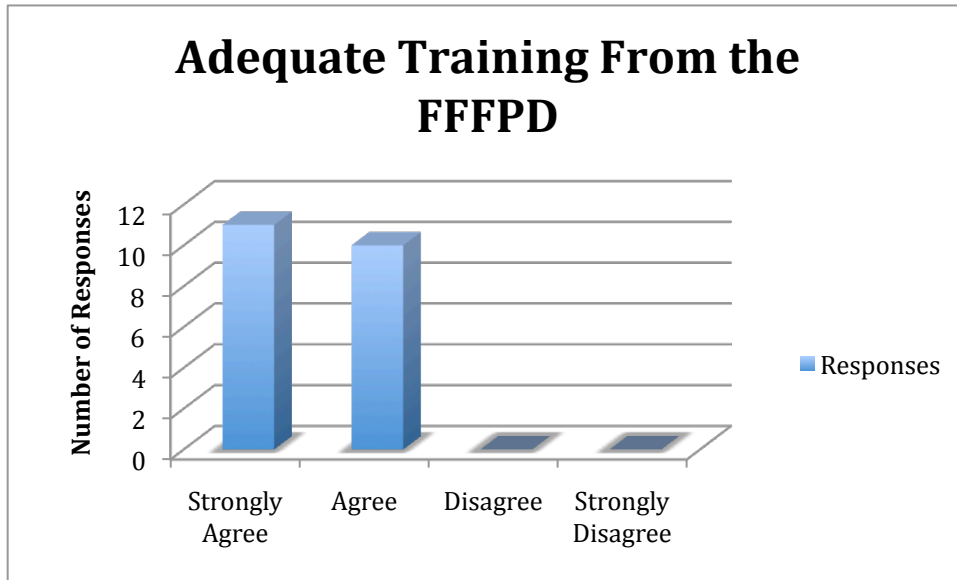


Figure 14. *Adequate Training From the FFFPD*

Table 14 and Figure 14 shows that the members of the FFFPD feel the department and training division supply them with adequate training.

The subjects were asked if they feel they are confident enough in their experience as a firefighter to mentor a member of the FFFPD. Table 15 and Figure 15 represent the responses.

Confident Enough to be a Mentor	Responses
Strongly Agree	14
Agree	6

Disagree	0
Strongly Disagree	1

Table 15. *Confident Enough to be a Mentor*

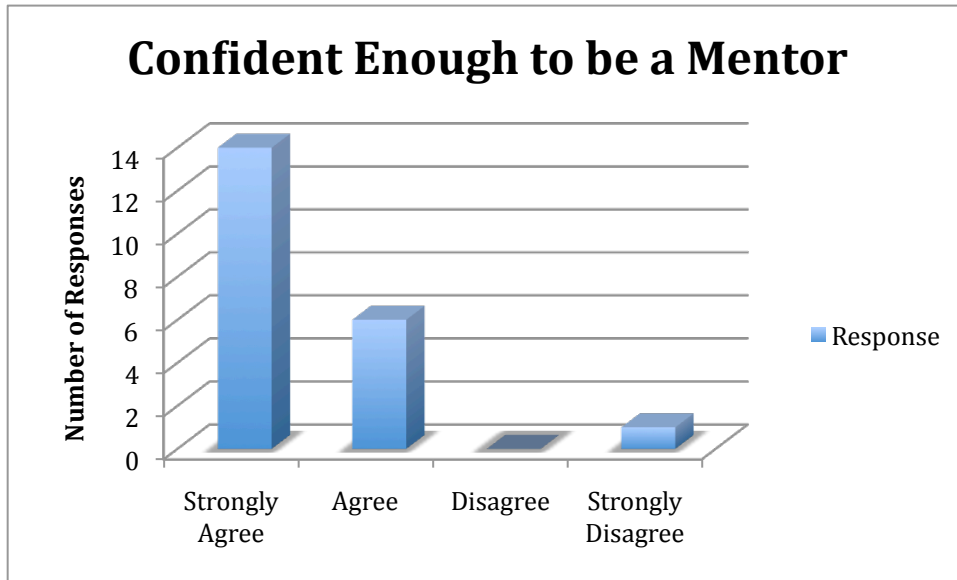


Figure 15. *Confident Enough to be a Mentor*

Table 15 and Figure 15 show that the majority of the department feels confident enough to be a mentor to a rookie firefighter. If the subject answered, “strongly disagree” or “disagree” to being confident enough to be a mentor, they were asked if having a mentor would be of value to them. The individual who stated they “strongly disagree” said a mentor would be of value, and the reason they did not feel confident with their skill set is because they are still in Firefighter I Academy.

The next three set of questions were short answer questions. This part contained questions 12, 13, and 14. These questions focused on the opinions of the subjects. The first question asked what part of fire fighter training they found most beneficial.

- 12 out of 21 (57.1%) responses focused on hands on training. Some added extra information such as: performing it at both the company/multi company levels, basic fundamental, and being show it first then practicing it with hands on.
- Two out of 21 (9.5%) responses stated they find the training ground most beneficial.
- One out of 21 (4.7%) responses stated that crew interaction which builds continuity amongst the membership is most beneficial.
- One out of 21 (4.7%) responses stated that they find that applying the skills in the field and the training ground reinforce skills most efficiently. Although, on the training ground, you can never simulate the emotional aspect your going to experience in the field. The training ground is great because it developes muscle memory in regard to learned skills. When you are caught up in the moment in the field, you default to muscle memory (training).
- One out of 21 (4.7%) responses stated the fire department needs to practice like they play. Simulate as little as possible, "do" as much as possible. Involve all companies that would be involved.
- One out of 21 (4.7%) responses stated they find teaching to be most beneficial.
- One out of 21 (4.7%) responses stated they enjoy physically seeing the difference they can do / make.
- One out of 21 (4.7%) responses stated they enjoy completing different kinds of training. Not just a couple of aspects.
- One out of 21 (4.7%) responses stated they enjoy all phases had no favorites. Their list included: discussion, videos, tabletops, computer, hands on, and drilling.

Question number 13 asked what part of firefighter training the subject felt was least beneficial.

- Seven out of 21 (33.3%) responses focused on classroom as being least beneficial. Two of these responses stated a hands on portion needs to follow classroom environments.
- Four out of 21(19%) responses focused on lecture being least beneficial. One individual stated lecture / PowerPoint.
- One out of 21 (4.7%) responses stated excessive amounts of specialty training is least beneficial.
- One out of 21 (4.7%) responses stated one out of 21 (4.7%) responses stated computer based online training is least beneficial.
- One out of 21 (4.7%) responses stated hurry up and wait is least beneficial.
- One out of 21 (4.7%) responses stated administrative functions is least beneficial.
- One out of 21 (4.7%) responses stated some trainings are made too unrealistic or things that will not be seen during our calls. We could practice these a few times but this individual would rather work on more realistic type scenarios and focus on the basics.
- One out of 21 (4.7%) responses stated any training from a closed mind instructor who thinks that there is only one way to do something and it is their way.
- One out of 21 (4.7%) responses stated that conducting the same evaluation trainings over and over again is least beneficial.

- Two out of 21 (9.5%) responses did not reply to this question.

Question 14 is the final question of the questionnaire. This question asked if the subjects have any suggestions to make training more beneficial to them.

- Two out of 21 (9.5%) responses stated no. One individual went on to say that the trainings are up to date and they see a wide variety of trainings.
- Two out of 21 (9.5%) responses focused on changing out instructors, and bringing in new instructors to see different experiences.
- One out of 21 (4.7%) responses stated more realistic training.
- One out of 21 (4.7%) responses stated the department needs to try new training methods and new techniques / tactics.
- One out of 21(4.7%) responses stated training needs to include us (all of us) in the trainings.
- One out of 21 (4.7%) responses stated keep on learning because it changes.
- One out of 21 (4.7%) responses stated the department needs to continue to train more.
- One out of 21 (4.7%) responses stated there needs to be more hands on training outside of the training center.
- One out of 21 (4.7%) responses stated that the district needs to continue to provide more opportunities for membership to attend outside trainings. This will allow more information to funnel back to our current members so we are all keeping up with changing strategies and tactics.

- One out of 21 (4.7%) responses stated training needs to follow the training guidelines established by service experts. Keep lectures short in duration, not to exceed 30 minutes, giving breaks with hands on proficiencies.
- One out of 21 (4.7%) responses stated that training needs to be a step process. First, I will show you how and what is expected, next we will perform task together in a step by step process, next you will perform task over and over until you can't get it wrong, then you will show me.
- One out of 21 (4.7%) response stated that mentor programs are very valuable. I have had some great experiences due to having the right mentors. With that being said, you have to have the right individuals to be mentors. It takes a broad skill set, education, experience, and delivery to be a good mentor.
- One out of 21 (4.7%) responses stated training needs to have more props (ie a force entry simulator). The live fire scenarios need to be harder including locked doors, victims, etc.
- Six out of 21 (28.5%) responses did not reply to this questions

The findings section contained the data that was gathered from the members of the Frederick-Firestone Fire Protection District. The data that was presented was split into three sections correlating with the sections of the questionnaire. The next section of this research project presents the interpretation of the data collected.

Discussion

Firefighters answer the call day in and day out. The skills that are needed to properly manage these calls vary widely due to the nature of the call. Fire service

professionals need to ensure the individuals who are responding to these calls are well trained and prepared to handle the situation. Understanding the best facilitation method that fosters learner retention is a must. This study focused directly on that issue. The overall research goal of this study is to increase knowledge, skill retention, and learning transfer among firefighters.

FFFPD Questionnaire

A survey was sent out to the members of the Frederick-Firestone Fire Protection District. This survey had three different parts and focused on the preferred environment and training methods used in the fire service. This survey allowed for a closer look into the how firefighters learn and the types of trainings they prefer.

Part one of the survey focused directly on the firefighters experience. It consisted of three questions, and allowed us to see the experience level of these individuals. 81 percent of the subjects are career firefighters with a majority of them having 10-15 years of fire service experience. The certifications that the study sample holds are abundant. These individuals have been through multiple trainings and have been able to find what type of facilitation methods work best for them.

Part two of the survey is the longest part and the main focal point. This part focused on the training experience of the subjects. This section contained seven questions and really focused on the training environment, testing of skills, methods of instruction, and job performance. Over 60 percent of the subjects completed more than 25 hours of training last month. They used a wide range of environments and methods. Question six specifically focused on the training environment. The data shows us that the subjects preferred hands-on training. The most preferable environment is at a different

location such as the training center. The subjects also prefer when the instructor demonstrates the skill, and then allows them to be involved and practice the skill. The data shows that over 90 percent of the subjects want to be tested by a practical hands-on test in order to prove they have learned and can perform their skills. Instructors need to remember that according to Williamson and Watson students who are taught with methods that matched their learning style have a 70 percent better success rate than those who do not (Williamson, 2006).

Part three consisted of three questions and was open-ended. This allowed for the subjects to express what they find is most and least beneficial. They were also allowed to provide any suggestions on making training more beneficial to them. The data again shows that a majority of the subjects found hands-on training most beneficial. Classroom and Lecture was the majority of what the subjects stated they did not find beneficial. One subject stated that book study, any training based upon reading only, including PowerPoint instruction with no practical application follow up is least beneficial. There were many suggestions to make training more beneficial to the department. Subjects focused on the instructor and said they would like to see different instructors teach the material. This could be through courses taught outside the district, bringing in new instructors and classes to the department, or by simply changing current instructors.

Kolb's Study

Trainings across the nation take place day in and day out. These trainings are completed through multiple different facilitation methods and environments. An overwhelming percent of the study presented to the FFFPD resulted in the firefighters enjoying a hands-on approach to trainings. Kevin Kolb from the Chili Fire Department

in Rochester, New York completed a similar study using a survey of 176 fire departments in the New York area. His research suggested that in order to have an effective training program, training needs to be hands-on in nature (Kolb, 2007). The findings from Kolb's study is very similar to the findings from this study, this also allows us to compare firefighters from across the nation.

Understanding that having an instructor, who is hands-on with the training material, leads to improved learner retention is a key finding of this study. Firefighters need to be placed in a position that forces them to use the skills they have been training on. This allows them to remember specific skills and allows them to make mistakes in a controlled environment. Over 90 percent of individuals surveyed said they wanted to demonstrate their skill set through a hands-on practical test. This goes to show they are hands-on learners and this type of skill testing will aid in learner retention. As presented earlier a learner with an accommodators learning style learns best from hands-on experiences (Williamson, 2006). This type of learning style appears to be prevalent in the fire service.

Environment

The environment in which firefighters learn is also a key to their success. According to the survey sent out, distance learning, classroom, and lecture scored low on the subjects preferred environment. Most of the subjects stated they preferred a training environment either at the station, or at a different location. This allows the subjects to get out of the traditional classroom setting and train with the tools that they will be utilizing on the fire ground. One of the seven characteristics of adult learning as presented by Dr. Dorothy Billington focuses on the necessity of the creating a learning environment where

the students feel safe and supported, allowing their uniqueness and abilities to be honored (Billington, 1996). This goes along with how the environment plays a role in learning transfer among firefighters. These individuals stated that they want and need to be out of the classroom in order to receive the highest skill retention. This data is very similar to information found and presented earlier in the discussion piece.

One of the focuses of the study was to find out how the instructor plays a role in the learners retention of the skill. An overwhelming 95 percent of subjects said that they prefer the type of instruction where the instructor physically demonstrates an activity or involves them in an activity as compared to verbally describing an activity or showing them a video. Another characteristic presented by Billington focuses on active involvement in learning, as opposed to passively listening to lectures (Billington, 1996). This data goes along with the rest of the findings and leads to hands-on training as the most appropriate facilitation method.

Conclusion

The findings of this study are very similar to the current methods presented earlier and used across the nation. Most firefighter academies use a wide range of facilitation methods with a large focus on hands-on training. While the findings of this study mainly pointed to hands-on facilitation methods, it is important to not only focus on one method. Classroom, lecture, distance learning, and hands-on training are all valuable to the fire service and all methods need to be presented to the learner. In the International Fire Service Training Association Fire and Emergency Services Instructor Manual a four-step method of instruction is presented. In this four-step method the instructor prepares the students to learn, presents the material, provides the students the opportunity to apply the

theory, then evaluates them on the learning process (Clausing, 2012). This method seems appropriate for fire service professionals and should be a combination of all facilitation methods including a large focus on hands-on training.

As stated earlier, the National Fire Protection Agency (NFPA), the United States Fire Administration (USFA), and the United States Department of Homeland Security (DHS) conducted a needs assessment study and found that an estimated 233,000 firefighters are involved in structural firefighting but lack formal training in those duties (NFPA, 2002). By completing this research project we will be able provide the findings from this study to those departments that are in need of training their men and women. This will allow those departments to use the proper facilitation methods and train their firefighters in the most appropriate and efficient ways. According to the prior mentioned needs assessment, the departments that are mainly in need of training are ones who serve communities with a smaller population such as ones under 10,000 individuals (NFPA, 2002). This information will save these departments money and allow them to become better trained and serve their communities with more knowledge and a better skill set.

References

- About Blue Card. (2011, January 1). Retrieved March 2, 2015, from http://www.bshifter.com/about_01.aspx
- Adams, D. (1999). Computer-based simulation to support training for complex and difficult incidents. Retrieved February 27, 2015, from <http://www.usfa.fema.gov/pdf/efop/efo29265.pdf>
- Billington, D. (1996, January 1). School of Education at Johns Hopkins University-Seven Characteristics of Highly Effective Adult Learning Programs. Retrieved May 3, 2015, from <http://education.jhu.edu/PD/newhorizons/lifelonglearning/workplace/articles/characteristics/index.html>
- Barnes, K. (2009). Physiological strain of firefighters exposed to a live firefighting exercise. Retrieved February 27, 2015, from http://digitool.library.colostate.edu/view/action/singleViewer.do?dvs=1425256658277~762&locale=en_US&VIEWER_URL=/view/action/singleViewer.do?&DELIVERY_RULE_ID=10&adjacency=N&application=DIGITool-3&frameId=1&usePid1=true&usePid2=true
- Clausing, C. (2012). *Fire and emergency services instructor* (8th ed.) (L. Snyder, Ed.). Stillwater, Okla.: Fire Protection Publications, Oklahoma State University.
- Creswell, J. (2015). *Educational research: Planning, conducting, and evaluating quantitative and qualitative research* (Fifth ed.). Upper Saddle River, New Jersey: Pearson.

Division of Fire Prevention and Control. (2012, January 1). Retrieved March 9, 2015, from <https://sites.google.com/a/state.co.us/dfpc/programs-2/emergency-management/certification-programs>

Galbraith, M. (2004). *Adult learning methods: A guide for effective instruction* (3rd ed.). Malabar, Fla.: Krieger Pub.

Goodson, C. (Ed.). (2008). *Essentials of fire fighting and fire department operations* (5th ed.). Upper Saddle River, N.J.: Brady/Prentice Hall Health

Kolb, K. (2007, June 1). The Effectiveness of the Department Training Program for the Chili Fire Department. Retrieved March 10, 2015, from <http://www.usfa.fema.gov/pdf/efop/efo40912.pdf>

National Fire Protection Association, & United States Fire Administration. (2002). *A needs assessment of the U.S. fire service No. FA-240* Retrieved from <http://www.usfa.fema.gov/downloads/pdf/publications/fa-240.pfd>

McClafferty, R. (n.d.). Effective Teaching Methods for Adult Learners in the District of Columbia Fire Department. Retrieved April 27, 2015, from <http://www.usfa.fema.gov/pdf/efop/efo42092.pdf>

Williamson, M., & Watson, R. (2006, January 1). How Teaching Should be Impacted By the Way Learners Learn Part II. Retrieved April 29, 2015, from https://system.netsuite.com/core/media/media.nl?id=105720&c=1155654&h=ef6530f751b3c152d29b&_xt=.pdf

Appendix A: Firefighter Questionnaire

Page 1 of 4

FREDERICK-FIRESTONE
FIRE PROTECTION DISTRICT



Office: (303) 833-3727
Fax: (303) 833-3736
E-Mail: Jwilliams@fffd.us

These questions should be answered as they relate to **firefighting** only and not to hazmat or EMS.

Part I - Your Experience

1. What is your current employment status with the Frederick-Firestone Fire Protection District? (Career, TFT, Reserve)

2. How many years of fire service experience do you have?

3. How long have you been employed at Frederick-Firestone Fire Protection District?

4. What fire certifications do you currently hold?

Part II – Training Experience

1. Last month, about how many hours of fire training did you complete?

___ 1-5 Hours ___ 6-10 Hours ___ 11- 15 Hours

___ 15- 20 Hours ___ 20-25 Hours ___ Over 25 Hours

2. What is your preferred training environment? To complete this question:

Read all items listed below and rank the items on a scale of 1 to 5 with regards to your preferred fire training environment. Use 1 as your least preferred training environment and 5 being your most preferred training environment.

___ Classroom

- Distance Education (online instruction)
- Computer Program (e.g. Blue Card Simulation)
- "Hands on" at the fire station
- "Hands on" at different location. (e.g. Training Grounds)

If there is another type of training environment you prefer, please describe.

3. To demonstrate the skills that I have learned in training, I prefer: (Please check only one)

- Paper test
- Practical "hands on" test
- Verbal Test
- Computer based test
- Tabletop exercise test

4. I prefer the type of instruction where the instructor: (Please check one)

- Physically demonstrates an activity
- Verbally describes an activity
- Shows me a video of another department completing the activity
- Physically involves me in the activity

5. I am confident in my ability to perform my job proficiently

- Strongly Agree
- Agree
- Disagree
- Strongly Disagree

6. The FFFPD provides me with adequate training to perform my job proficiently.

- Strongly Agree
- Agree
- Disagree
- Strongly Disagree

7. I am confident enough in my experience as a firefighter to mentor a member of the FFFPD.

- Strongly Agree
- Agree
- Disagree
- Strongly Disagree

If you answered “strongly disagree” or “disagree” to the previous question, would having a mentor be of value to you?

- Yes
- No

Part III – Your Opinion

8. What part of firefighter training do you find most beneficial?

9. What part of firefighter training do you find least beneficial?

10. Do you have any suggestion to make training more beneficial to you?

End of Questionnaire

Thank you for your participation!