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Analyzing the Effectiveness of the On-the-Job Firefighter Training Model Within the Murray City Fire Department

J. Jordon Petersen

Murray City Fire Department

Murray, Utah

Certification Statement

I hereby certify that this paper constitutes my own product, that where language of other is set forth, quotation marks so indicate, and that appropriate credit is given where I have used the language, ideas, expressions , or writings of another.

Signed 

J. Jordon Petersen

Abstract

One of the most important tools firefighters carry into dangerous and damaging incidents is their education and training. A properly trained firefighter is less likely to be injured or killed in the line of servitude. The problem is that the Murray City Fire Department (MCFD) was not effectively applying a training model which is efficient in keeping firefighters adequately trained. The purpose of this research was to identify the level of effectiveness in the on-the-job training model within the MCFD regarding instructor competency, environmental conditions, and overall impact on firefighter safety; and to identify areas for possible improvement. This research identified the positive and negative variables which impact and influence the traditional on-the-job training model within the MCFD. The research contained in this study looked at variables of distraction, instructor competence, and potential options for change and improvement. Descriptive research methodologies were used in conjunction with literary reviews, survey questionnaires, and data gathering tools to research the following questions: (1) How effective are on-the-job instructors in their ability to provide effective training? (2) How conducive is the on-the-job environment with an effective curriculum delivery? (3) What are the potential safety hazards associated with allowing new firefighters to operate within the normal ranks during on-the-job training curriculums? (4) What are other organizations of similar size doing to provide effective training delivery? Research procedures consisting of incident statistics, fire instructor surveys, and organizational surveys revealed detriments in the on-the-job training platform in busy organizations where frequent distractions and the inability to allocate adequate time to the training process were prevalent. Overall results showed frequent call distractions, complacency in instructor competency, and significant safety issues with the current on-the-job training model in the MCFD. Recommendations included creative approaches to

training, providing dedicated training staff, and creating general awareness into the detriments of on-the-job training variables.

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Introduction

In the dangerous, dynamic, and ever-changing environment of the fire service, training and education, play a monumental role in the success and longevity of a firefighter. Knowledge and awareness are absolutely essential in preventing firefighter injuries and deaths. Given the best equipment, and a courageous capacity to place oneself in harm's way, are not nearly important or impactful as being properly qualified and prepared to take action (Ford, 2012). Unfortunately, not all training deliveries promote positive learning and retention, and become convoluted by distraction and ineffective educational practices. One complicated training delivery method is the traditional on-the-job training model in which training is integrated as part of the daily activities and duties of a firefighter. There are many subsurface distractions and complications with the on-the-job training model which, when identified, can be accurately corrected and compensated for.

The problem is that the Murray City Fire Department (MCFD) is not effectively applying a training model that is efficient in keeping firefighters adequately trained.

The purpose of this research is to identify the level of effectiveness in the on-the-job training model in the MCFD regarding instructor competency, environmental conditions, and overall impact on firefighter safety; and to identify areas for possible improvement. This research will identity the positive and negative variables which impact and influence the traditional on-the-job training model within the MCFD.

Descriptive research methodologies were used in conjunction with literary reviews, survey questionnaires, and data gathering tools to research the following questions: (1) How effective are on-the-job instructors in their ability to provide effective training? (2) How conducive is the on-the-job environment with an effective curriculum delivery? (3) What are the

potential safety hazards associated with allowing new firefighters to operate within the normal ranks during on-the-job training? (4) What are other organizations of similar size doing to provide effective training delivery?

Background and Significance

The Murray City Fire Department (MCFD) is an all-hazards emergency service provider, based at the municipal city level. The MCFD was established in 1906 and has played an active and aggressive role in staying progressive in providing emergency services for the City of Murray. The MCFD consists of 65 sworn personnel within a traditional fire department structure and chain of command. The department operates out of three stations strategically located throughout the city. Each station houses fire apparatus consisting of engines and trucks, ambulances, and chief level officers both in the response stacking and administrative positions to support line personnel.

The MCFD provides fire protection, prevention, and response in all the traditional manners. The EMS delivery is found in the advanced delivery of Advanced Life Support services on the majority of fire apparatus, and all of the ambulance services. The MCFD also provides services in hazardous materials response and mitigation, specialty rescue in all disciplines, wildland fire response, and urban search and rescue capabilities. The MCFD takes pride in its progressive approach to emergency response and is constantly seeking to improve, adapt, and take-on responsibilities as beneficial to the City of Murray.

Between the three response stations, the organization responded to 6,600 incidents in 2016. Incidents include: fire, medical emergencies, hazmat, specialty rescue, and any other miscellaneous 911 request for assistance. Daily events and responsibilities in addition to emergency call-outs include: vehicle and equipment checks and maintenance, physical exercise

time, building pre-planning and business inspections, scheduled tours and public event participation, training and evolutions, station maintenance, and miscellaneous tasks and responsibilities. The traditional and cultural approach to tasks and responsibilities has led to the informal expectations in which MCFD personnel are engaged and busy from the start of the shift until five o'clock, and then from five o'clock pm on, crews are on personal time with the exception of emergent duties. MCFD crews remain quite active throughout the day in an effort to complete all the assigned and expected duties.

MCFD is located in the central heart of the Salt Lake Valley, surrounded by other municipalities of differing size. The Salt Lake Valley is comprised of nine separate fire service organizations which all serve a population of close to two million people. Each fire department jurisdiction works incredibly well together in the form of mutual agreements, shared protocols and operating guidelines, and training opportunities. The relationship shared between the over fifty fire stations in the valley is a textbook example of professionalism in emergency service delivery. Each organization approaches service delivery with surrounding organizations in mind as equipment, staffing, and common dispatch are all agreed upon by all organizations before one organization adopts a new manner in which to respond.

The training structure within the MCFD is primarily accomplished through the use of a training committee. Coordinated by a regular training Battalion Chief, the committee occasionally meets and discusses training goals, upcoming classes, and general direction. The MCFD does not have dedicated training personnel whose sole duty is arranging, coordinating, and facilitating the training activities of the organization. Rather, a platoon Battalion Chief is steward with the duty. The primary source for training is found at the Captain's discretion. The vast majority of training in all fire, EMS, and specialty disciplines are conducted as a crew. The

captain prepares, presents, facilitates, or delegates training activities. Some officers have struggled to keep up with the demands of operating as a supervisor and regular instructor.

New firefighters which are not sent through an academy engage in an extensive and thorough on-duty training regimen. New firefighters are trained from everything on the basic skills of donning protective, to the other expansive end of the spectrum to include complex incident duties. The training goal includes the inevitable competency and independent autonomy of the new firefighter and their ability to operate on a fully functioning crew. The process of training a new firefighter is largely unstructured with the exception of a basic skills pass-off issued to each new firefighter. The assigned Captain and crew take on the mantle of training each individual firefighter over the span of the assigned timeframe. Progression through the training as well as the training topics are established as desired by the captain and crew. There is no formal route or training expectation for new employees.

The training structure within the Salt Lake Valley is very unique in the sense that the fire departments in the Valley established a common training group known as the Salt Lake Valley Training Alliance. The training alliance is dedicated to providing the best and most progressive training to all firefighters within the Salt Lake Valley, regardless of the organization each is employed by. The venture has led to a wealth of training opportunities and established a level of firefighter training which is comprised of all disciplines ranging from basic fire skills to complex Urban Search and Rescue Operations on a worldwide scale.

While many entry level firefighters will have attended some level of firefighter training, once a firefighter is hired by various Salt Lake Valley fire departments, they still may be required to attend, and successfully complete, a department-based academy. The presence and requirement of the academy is strictly based on the individual organization and their feasibility in

sending new employees to training for three to four months. Some of the larger organizations make a requirement of sending new employees through the academy. Other organizations lack the staffing, funding, or desire to send employees through more training. In organizations which send all employees through training academy, it does not matter that employees may already possess all the firefighter certifications, they are still required to complete the training.

When conducting new-hire testing, the MCFD places emphasis on selecting candidates which have been trained and possess an array of certifications. Where other organizations may select candidates based on any number of non-fire service related qualifiers, MCFD recognizes the impact of individuals who are trained and ready to operate in the field. One of the attractive components to potential employment is the presence of academy backgrounds known as Recruit candidate Academy (RCA). The RCA designation denotes that an individual has completed a structured certification process in which the candidate was held to strict learning and skill development standards. One of the most attractive RCA programs is the one produced by the Utah Fire and Rescue Academy (UFRA). The UFRA academy is reflective of a new-hire academy in the sense that candidates are held to high standards of learning, behavior, conduct, and respect. When assessing potential hiring candidates, MCFD places value on UFRA RCA graduates.

The MCFD has an inconsistent history with how new employees are introduced into the service. In the previous twenty years, new employees have been brought through varying degrees of academy experience and others who have had no formal training prior to beginning shift work. Originally, newly hired employees would engage in a quasi and informal learning and evaluation period in which they worked a 40 hour work week for approximately three to four weeks. During this time, employees would be perform evolutions, skills demonstrations, and

some informal classroom. The short training period was typically organized and guided by a duty battalion chief in charge of training. Upon completion of the venture, employees would then be assigned a station and a crew for the remainder of the yearlong probation period. During the probation period, the crew is required to bring the new firefighter to a level of competency and professionalism by conducting on-duty training and education. The quality and frequency of the training received is largely based upon the individual crew and Captain combination. Some crews take the responsibility very seriously and structure the training period to be effective. Other crew and Captain combinations see the daily training as a burden and file to provide adequate time and resource to making it effective. MCFD has suggested routes and training curriculums, but there is currently no obligation of requirement to train new employees to any specific level.

While the history of new-hire training and transition periods has been consistent with the process previously described, there have been a number of exceptions. Some newly hired employees have been hired and started right on shift without a formal or informal training period, and a few select employees were actually sent to an intensive new-hire training academy. The Salt Lake City Fire Department (SLCFD) and the Unified Fire Authority (formerly Salt Lake County Fire Department) have placed open invitations to some of the smaller Salt Lake Valley fire departments to allow their newly hired firefighters to attend the academy with SLCFD and Unified new-hires. MCFD took advantage of the invitations on a number of random occasions and sent newly hired firefighters through the academy. On all the occasions, new-hires were individuals who had the requisite level of certification and training, but MCFD perceived that the academy experience would be a positive approach. Sending new-hires to the academy produced

positive results, but was never a consistent move for the MCFD and as of this research, academy attendance is sporadic.

While sending new firefighters to the SLCFD or Unified academy was perceived as a positive step, many variables affect the feasibility to do so. Being a smaller organization with only three fire stations, having an employee at academy and unavailable to work shifts was troublesome and difficult. Typically MCFD hires new employees based on demand and open positions as a cost saving measure. When a spot becomes available for hire, it is difficult to have the spot remain vacant for three months of formal training. Furthermore, the cost of employee wages, benefits, and insurance is quite substantial as an employee's salaries are being paid for the three months of academy time, without yielding any employee rendered services to justify the costs. The city also is required to provide any costs associated with operating the academy i.e. instructor costs, materials, protective gear, and teaching props. On occasion, the SLCFD and Unified academies have requested that MCFD offer an instructor for the academy period which is offered in the form of a MCFD Captain level training officer. The mounting costs and requirements have often posed a challenge when the prospects for sending newly hired firefighters to academy are presented

Once an employee has completed an academy requirement with SLCFD or Unified Fire, they return to MCFD and engage in the on-the-job training regimen. The on-the-job portion is conducted on the assigned shift, with the assigned Captain and crew combination. While the skills a new employee develops through the academy are above reproach, there is still a number of important lessons which specifically pertain to the subtleties and intricacies of how the MCFD operates. MCFD also takes the adamant stance that firefighters must be constantly working toward skill mastery and learning which will take an entire career. So regardless of if a

firefighter is primarily trained by the crew and captain on duty, or if they are sent to an academy, learning and progression are an integral part of being a MCFD firefighter throughout their career.

The overriding direction of this study is to analyze how effective training delivery currently is. The MCFD prides itself on how well its firefighters are able to respond and mitigate emergencies, but has never made an attempt to assess the quality and effectiveness of the current training platform.

The past problems with the training demand and delivery have manifested in training encounters which were subpar, unremarkable, and unfortunately unmemorable. Officers within the MCFD have seemed to dislike the role of instructor, and failed to allocate proper time to preparing good training.

Past manifestations of the problem have yielded an inconsistent workforce of new employees and an increased demand on response personnel to take accountability on all new-employee training. Academy trained firefighters enter the work force well-versed and competent in fire skills. New employees who have no prior academy experience do not possess the same competencies and state of readiness seen in academy training individuals. While the non-academy employee will receive the necessary training and competency development while on-duty, the training is dependent upon the Captain and crew combination and their competencies and quality of training in an organization whose time has become constraining.

Past presentations have also been manifested in the manner in which new firefighters may be placed into operation prior to becoming operationally ready. As firefighters are hired and placed on-duty, they are subjected to the incidents without filter. As new firefighter are called to respond to complex and dangerous fires, they are expected to act as a fully functioning firefighter, but if they lack requisite skill and competency, they are presented a very disastrous

scenario. The lack of readiness has manifested in poor decision-making, inadequate task completion, and minor injuries to name a few.

Current presentations of the issues are seen in the quality and efficiency of new-hire training, and training in general. Training is scheduled as a daily activity, to be intermingled with all the other daily activities. As the number one priority of the organization is found in responding to emergencies, training is often interrupted and cancelled based on incoming calls. As the MCFD responds to a high number of incidents, interrupted training sessions have become a mainstay. The frequent interruptions and cancelled trainings create an environment in which quality, uninterrupted training is rarely conducted. New-hire trainings are often missed, shortened, or filled with distractions.

There is also the current issue with training facility usage and materials with which to conduct realistic training. The MCFD does not have a training facility within the city boundaries and training evolutions are often conducted in parking lots, parking structures, and improvised locations. The environment fails to provide an adequate and realistic approach the realities of a chaotic scene. The inconsistent setting constitutes a less than optimal learning ground for new firefighters which hinders their competence development as compared to a dedicated facility and dedicated time.

The future impact of this issue revolves around the need for training and competence development. MCFD newly-hired firefighters are not being trained adequately and competently. The lack of training creates a product which may not manifest, until a complex incident challenges the upper limit of a firefighter training and skill competency. The product of this dynamic variable could present loss of life and serious injury to firefighters. By having new

firefighters placed in full operation, without having completed a full scale volley of training, is a game of odds with catastrophic losses.

The revelations contained in this Applied Research Project seek to fulfill the fourth goal of the U.S. Fire Administration's strategic initiatives which projects the need to improve the fire and emergency services professional status by ensuring that emergency services organizations have adequately educated and trained personnel to fill leadership positions (2010, p. 14-17)

The curriculum for the National Fire Academy's Executive Leadership course emphasizes the importance of time and the beneficent use of time as a means to promote good life balance, personal wellness, and proper development (Federal Emergency Management Agency, 2015, p. 2-17). Training represents a significant expenditure of firefighter time, energy, and commitment which should be adequately fostered through a proper approach to learning and development. This research seeks to identify the positive and negative areas in which time is being utilized efficiently.

Literary Review

With a service industry as hazardous as the fire service, knowledge and awareness are absolutely essential in preventing firefighter injuries and deaths. Given the best equipment and a courageous capacity to place oneself in harm's way are not nearly important or impactful as being properly qualified and prepared to take action under stress (Ford, 2012).

Organizations which choose to forgo the necessary training regiments and minimum qualifications, take on a drastic liability in the fields of firefighter safety. While an organization may assume a firefighter's training is adequate based on previous employment or educational experience, it is a distinct responsibility of the organization to assure the training is not only

adequate, but reflective of the working conditions and environments of the incoming organization (Stephens, 2014).

The military adopted a mantra called doctrine as a codification of beliefs. The doctrine establishes the belief that all service members deserve to be properly equipped, properly trained, and properly led. The same applies to the fire service whose occupational hazards are inherently dangerous with training, and disastrous without proper training. Every firefighter inherently deserves the right to be properly trained and equipped (Ford, 2012). Training in the fire service is not a customary introduction to the career, nor a professionalism issue as much as it is a safety issue. One of the most decorated from the Vietnam conflict, Colonel David Hackworth stated "practice does not make perfect – it makes permanent" (as cited in Ford, 2012).

Well trained firefighters have decreased injury rates, decreased line of duty death rates, and increased overall wellness (Merrell, Zhou, Valentine, Goldstein, & Slocum, 2008). To be a safe firefighter is to be a well-trained firefighter. As David Hackworth cited, "a firefighter does not rise to the occasion of a monumental event, they revert to their lowest levels of training" (as cited in Boser, 2017). When that foundational training level is low, firefighter run the risk of performing at a subpar level of execution. When, on the other hand, a firefighter has a solid level of foundational training, that firefighter has a higher probability of successful and safe outcomes.

While firefighting is often viewed as an emotionally taxing and stressful service, the majority of firefighter strength and wellness originates in the manner in which a firefighter knows what to do. When people fail to understand a situation, that situation becomes overwhelming, daunting, and difficult to process (Leimone, 2017). The processes associated with tunnel vision, emotional escalation, adrenaline spikes, and emotional agitation traditionally

accompany feelings of not knowing what to do. Training is that integral protection barrier which keeps firefighters in a proper frame of mind and reference. By staying in a positive mindset, firefighters avoid excessive adrenaline spikes and feelings of tunnel vision by helping them feel like they know and understand a situation well enough to remain in control. The application of proper training is now making an impact on pre-PTSD prevention curriculums (Leimone, 2017). As a firefighter is taught all aspects of their job, they are more able to stay in a working and functioning mind-space. When, however, a firefighter begins to experience a situation in which their training does not meet the demands of a situation, they tend to get emotionally overwhelmed which ultimately sets the firefighter on a dangerous path of emotional struggles. Knowing what to do and how to do and how to do it is one of the most important aspects to firefighter mental wellness training.

Being a professor, instructor, teacher, or learning facilitator requires some very distinct personality traits as well as actions to bring about educational success. To become a successful educator, one must first be able to devote the time to preparing, coordinating, delivering, and following-up on the material to be taught. Good teaching is not a processes of improvisation or happenstance, it is a structured and methodical demonstration of key points which have been predetermined with adequate forethought (Williams, Billington, Goodley, Corcoran, 2016). A good instructor both within and out of the fire service should be spending a minimum of three hours preparing for every one hour of presentation. This minimum number reflects the need to study the material out, determine how to adequately present the data, organize props and learning materials, and become well versed in the material (Laird, 2015). Improper preparation leads to distracted deliveries, improper imparting of selected information, and convoluted learning and retention on the part of the learner. Preparation is the key to effective instruction.

The profession of an instructor is a noble and taxing service. Just as any service industry which hinges on professionalism, not everyone has the skills, competency, and desire to be an instructor (Corno & Anderman, 2016). Ross (2014) cited that those who are successful in the service typically share a number of common traits and qualities which lend to their credibility, efficiency, and professionalism. First, a good instructor is passionate about the subjects they teach. Passion is a product of interest, eagerness, and devotion to a subject. The passionate educator is able to convey a sense of excitement and interest into the students. A sense of passion becomes contagious, invigorating, and engaging for those who participate in the learned subject. When students engage in a classroom environment in which passion is present, their retention and motivation rates increase. A good instructor has the ability to take a less than enticing subject and make it invigorating for students as long as they apply the subject with passion. The second trait of a good instructor is simply to maintain and project a positive attitude (Ross, 2014). When an instructor fails to project a positive or applicable attitude, students will adopt and embody the attitude as well. If an instructor projects an attitude which may suggest that a training topic is non-applicable, students will ease their need to maintain an attention span. If on the other hand, an instructor portrays a serious undertone and need for the content, students are more likely to listen and learn. Third, good instructors care for the wellbeing of their students (Ross, 2014). Caring is often portrayed in time spent with each individual student as well as the manner in which training is catered and well delivered. Poorly conducted training, which is not catered to the students, often makes students feel that the instructor is not concerned for their wellbeing. When students feel they are not important, they tend to lessen their motivational output and willingness to apply active learning processes. Forth, instructors need to feel confident in the material being presented (Ross, 2014). Instructors

can gain confidence through extensive personal study, prior educational experiences, and previously experienced knowledge. With each category, experience becomes a process of then applying that prior knowledge into the teaching outline. A non-confident instructor often fails to recognize whether a learning session is efficient or if it is failing to connect. Finally, a good instructor has the ability to motivate learners. Motivation creates a desire to lea rn (Ross, 2014). If a student is not motivated to learn the information, their retention rates will decrease drastically.

There is much to be understood and acknowledged in collaborative learning environments. Collaborative learning is the ability for students to learn from each other as they traverse an instructor-led curriculum (Stahl, 2012). As educational institutions grapple with the detriment of teacher/pupil ratios, there is one clear understanding, too many students per teacher tend to strain the learning process, but too few students has the same effect. Healthy learning environments require other students from which others can model behavior, vicariously learn from others successes and failures, and find comfort in numbers. Some learning environments which consist of only a few students can be stressful for the learners as an inordinate amount of attention and pressure are directed toward the few students. Students also have a distinct psychological effect on each other as comradery, togetherness, and an empowering sense of shared accomplishment help students progress more efficiently as a group than they would as individuals (Stahl, 2012). The synergistic properties of group advancement pertain to all levels of learning and in all disciplines of study. Many military boot camp and indoctrination programs are based on the synergistic approaches to group performance and heightened learning.

In regard to military intensive learning environments, there is one very powerful psychological principle obtained through boot camps and indoctrination programs. Many

military programs are designed to push the human body and mind to the absolute edges possible. Members are brought to points of exhaustion, sleep deprivation, hunger, and stress all while continuing to function at high levels. The purpose behind the discomfort is to empower soldiers as to their limits. If a soldier can push their body to extreme limits, all the while knowing they can back out at any point, the can begin to build a mental toughness beyond any reaches outside of the boot camp curriculum (Smith, 2013). The successful completion of an intense program leaves the individual with a heightened ability to tolerate stress, fatigue, hardship, and difficulty. This trait is one of the most important aspects to becoming a successful soldier.

The goal of education is not only to deliver a quality product, but to assure that the product maintains a healthy retention rate. As information is learned, processed, and stored, much of it is forgotten over time. Art Kohn (2014) outlines the well-known retention curve which shows that 70% of information learned after one day is retained, after one week, 30% is retained, after a month, only 15% is retained, and at one year later only two percent of information is retained. A two percent rate of retention is often correlated with only being able to remember the topic of a course. The effects of retention can also be influenced for both better and worse. Having top-notch instructors, intensive learning environments, and realistic learning experiences have been shown to increase retention rates by 10% in the long term (Kohn, 2014). Other retention tactics involve revisiting topics on repeated occasions over the next few months. The military seeks to assert heavy influence of the retention curve as the structure, pressures, and psychology of boot camps are reflective of the need to make learning a psychological experience. As military members engage in the intensive structure and process of boot camp, the material being taught has an increased ability to be remembered. The boot camp structure also encourages people to experience the stresses of service without actually being engaged in the

dangers of the service. The combined variables of intensive learning and realistic stressful environments make for an elevated retention rate and a better soldier.

Most fire service organizations have recognized, in some part, the need to influence the retention curve, and regularly train on skill previously learned. Fire crews will get together to review and practice skills as a means to bring their retention rates up. Unfortunately, learning retention rates continually drop and must be properly maintained by revisiting subject on a continual basis. An optimal learning format would revisit a topic on an annual basis if the concept is not in regular practice. If a concept is properly learned the first time, an annual review of the material and practice will keep the competency at an acceptable level. If the skill was only partially learned the first time due to incomplete information or distracted learning, the learning and retention rates may fail to adequately hold at a minimum (Kohn, 2014).

Service organizations such as the military, law enforcement, and the fire service often place inordinate value on experiential learning. Experiential learning is the notion that an individual will be thrust into a real life experience and challenged to learn, adapt, and accurately mitigate the problem (McCabe, 2014). Given the unadulterated and unbridled nature of military and public safety, experience without adequate prior training has the potential to cause damage promote adverse skill development. People naturally revert back to their training for baseline decision making and action potentials. When someone lacks the preconditioned training levels, they tend to improvise on previously learned and experienced events which have been stored in the memory bank. If a firefighter's only experience with fire is based on the notion that fire is dangerous and should not be engaged, that firefighter's only inclination will be to disengage a firefighter as opposed to engaging. The detriments of the process become exacerbated when a firefighter has not been trained to handle personal survival emergencies, dangerous incidents,

and mentally damaging occurrences. If firefighters are not adequately trained for a given situation, but are made to learn from experience, their training may produce very negative outcomes for the health and safety of the firefighter.

When striving for the heights of teaching efficiency, many educators will apply an authentic learning model. Authentic learning is the ability to relate the information being learned to the student's everyday life and circumstance (Weimer, 2012). As teachers are able to apply authentic strategies, students will be better able to link new information with existing known information. When students can create a link between processes already understood and processes being taught, they have a drastically increased ability to retain learned information. There are a number of ways to increase the authenticity of a delivery including, have real-world relevancy and not simply delivery of information, provide complex tasks which require significant time and cognitive processing, provide students with the opportunity to collaborate, require students to reflect on their own lives and how the information pertains, integrate some sort of assessment or evaluation principle to be applied, and allowing students to expand upon and create diverse outcomes to learned principles. When an authentic environment is created, learning is enhanced and problem-solving are strengthened (Weimer, 2012).

When training individuals for stressful and taxing industries, there is a strong psychological component to the training. A firefighter may be taught how to operate a hoseline under normal conditions, but when that firefighter is exposed to extreme stress, the act of operating a hoseline takes on a psychological factor which can impede successful execution. The phrase came to be known as the need to train the way we fight. The military came to realize that when adequately training soldiers for war, they needed to replicate the conditions of war (Elder, 2013). If they could replicate all aspects of war, they could condition a soldier's body for

the experience. By training for the experience as a whole, soldiers become less overwhelmed, more competent to make decisions, and retained more situational awareness. Proper fire service training incorporates not only skill development but the re-creation of all experienced variables. These variables include the stress of an emergent and pressing scene, the dangers of the scene, the urgency of the tasks, and the physical processes and events associated with the skill evolution. A firefighter's ability to remove the hose from a fire apparatus and accurately set it up for a firefight only partially recreates the environment in which the skill is deployed. An inclusive skill would include pulling to hose on a burning structure with urgency and obstacles. Organizations have developed training props, live fire exercise rooms, and burn rooms designed to replicate the exact environment a firefighter will encounter. The more realistic a training evolution is, the more likely the firefighter is to learn and ultimately perform.

Inverse to the need to recreate real-life training environments are the detriments of unrealistic training. Once skills are learned, the subconscious part of the human brain takes over the skill, leaving the prefrontal cortex available to processes incoming information (Williams, Billington, Goodley, & Corcoran, 2016). When the prefrontal cortex becomes overwhelmed with incoming information, tunnel vision and loss of thought occur. If a firefighter has the ability to learn skills in realistic situations, the subconscious part of the brain is able to process a massive portion of the execution leaving the prefrontal cortex available for situational awareness, decision making, and higher cognitive processes needed in a firefight. When on the other hand, the realities of an incident are primarily being processed by the prefrontal cortex because the mind is unfamiliar with all the stimulus, the mind has only a limited capacity to process all events. Firefighters often experience tunnel vision, adrenaline surges, and blank thought processes due to the overwhelmed situation.

The typical firefighter academy, when completed based on a 40 hour week, takes in the neighborhood of three months. Some organizations devote more time to teaching the intricacies of inter-departmental standards and conduct, but the minimum is about three months before a foundational understanding has been achieved (UFRA, 2017). It should be understood that the foundational understandings are simply a benchmark from which a firefighter needs to learn, grow, and progress. Many organizations will assign their new firefighters directly after academy with further training requirements before they are fully competent. This subsequent training format is often found in the form of on-the-job training and journeyman learning formats. Having employees go directly from the academy into the field allows for the majority of foundational skills to have been developed. The traditional curriculum for a fire academy cadet consists of 38 lessons which are taught over the span of time for which the cadet is committed to the program

Not all training and education is created equal. Distractions play a large role in what information is received and retained and what is not. Studies have increasingly shown the detriment of students having access to T.V.'s, social media and internet, phones, and other distractions at home and in the classroom (Rosen, 2012). While a student may be present, the subtle distractors take a heavy toll on the information learned and retained. The detriment of distractions is also not simply a brief lapse in concentration, when a distraction occurs, it breaks the chain of learning. If a student is taken out of a class half way through, only then to be placed back into the classroom, a requisite time is needed to review the previously taught material and begin again. The more distractions which occur, the more likely a student is to lose the ability to retain any normal portion of it. Under normal circumstances, when a student encounters a distraction which completely diverts their attention for a space of time, the instructor will need to

begin at the starting point to assure that the information is fully comprehended (Muir, Witchell, McKeever, & Kamath, 2013).

Distractions are not simply defined as a phone call, T.V. in the background, or a disruptive behavior, a distraction is any form of interference which complicate the learning and retention process (Rosen, 2012). Distractions may come in the form of inadequate sleep the night before, basic necessities such as hunger or thirst, and even distracting thoughts and worries. As long as distractions are present, learning and retention are drastically complicated and largely ineffective.

One of the most detrimental distractions and hindrances to effective learning is sleep deprivation and overall poor sleep surrounding the learning process (Prince & Abel, 2013). The brain functions in processes, and those processes are highly affected by the ability to intake, understand, and store learned information. When the body lacks the proper sleep and rest required to apply full function. When the body lacks proper rest, it lacks the ability to fully comprehend information, adequately store learned information, and retain any level of learned information for an adequate timeframe (Prince & Abel, 2013).

The United States Department of Education advocates the use of high-stakes testing as defined by the use of a single test which will determine advancement and placement. The use of high-stakes tests are seen in the military, fire service, and many civil service institutions as a means to recruit and determine eligibility into varying programs. High stakes testing and assessment environments have proven to be stressful for students and their use has been met with some critical analyses based on the heightened stress, but they have yielded one distinct product. Students who recognize the use of high-stakes tests tend to more fully prepare for the test (Finn, 2013). Students tend to study, seek help, and make every advantage available in achieving a

positive score. The use of these high stakes tests are also influencing motivators and catalysts for learning. As students recognize the need to score well on the assessments, they more fully learn the information, back it up with proper study skills, and perform better overall. While high-stakes testing is often associated with educational placement exams and program entrance exams, they also come in the form of final exams, pop-quizzes, unit examinations, and skills testing. If a student knows they will be tested, they typically spend more time, energy, and devotion to becoming proficient.

Opposed to the environment in which high-stakes testing and assessment are used is the environment which utilizes non-consequential learning. Non-consequential learning is the environment in which participation is the only qualifier. Students are not required to study material, prepare for assessments and evaluations, nor complete assignments or homework. The non-consequential learning environment is relatively stress free and comfortable for the student, but it also has decreases in overall learning and retention. A significant aspect to effective learning is the underlying motivation and drive which is often fostered through a fear of failure and need to succeed. When student attendance is the only assessment instrument, people tend to limit their engagement and attention span.

Education in all forms should be viewed as an investment in the employee as well as in the organization. A properly trained and educated employee yields higher outcomes in productivity, motivation, dedication, and long-term respect for an organization (Monroe, 2016). Organizations who take the time and money to invest in their employees often see less turnover rates and higher job satisfaction.

In summation, this literary review analyzed the impacts of previously studied principles affecting the psychology of teaching and learning. Much of the literature reviewed focused on

practices and principles being applied in progressive learning environments which focus on adaptive learning models suited to meet the demands of the learner. This literary review also explored the detriment of distractions and how they affect attention and overall retention. Overall, the major influences of this project, and the manner in which literature was reviewed and selected, had to do with the manner in which fire service training can be improved based on practices being employed in the educational realm. The observations and discoveries noted in this literary review shaped the theories and framework from which this research commenced.

Procedures

The purpose of this research was to identify the impacts and efficiencies associated with firefighter training in the on-the-job platform. The study seeks to clarify the detriments, losses, and areas of potential improvement based on the current MCFD model of training. Descriptive methodologies were used to correlate literary reviewed material as a means to create a foundation from which questionnaires, and statistical data was collected.

The procedures used to obtain results were primarily guided by an in-depth analysis of the problem statement; the problem is that the Murray City Fire Department (MCFD) is not effectively applying a training model which is efficient in keeping firefighters adequately trained. The direction of this analysis began with an extensive study of literature and data at the National Fire Academy's Learning Resource Center while attending the Executive Fire Officer Executive Leadership course in May of 2017. A wealth of applicable fire service and private industry periodicals, peer-reviewed research, texts, and internet material all served as a framework from which research would continue. The general nature of the research revolved around principles of educational psychology. Given the educational discipline, an emphasis was placed on information found outside of the fire service and more toward the realm of general

education. All sources of literature were carefully scrutinized for credibility, applicability, and validity regarding use in this research.

Subsequent to the establishment of a problem statement, four research questions were created to act as guides for the end-point research goal. The three questions included: (1) How effective are on-the-job instructors in their ability to provide effective training? (2) How conducive is the on-the-job environment with an effective curriculum delivery? (3) What are the potential safety hazards associated with allowing new firefighters to operate within the normal ranks during on-the-job training curriculums? (4) What are other organizations of similar size doing to provide effective training delivery?

Question number one, how effective are on-the-job instructors in their ability to provide effective training, was primarily answered through a thorough analysis of current literature regarding the subject, as well as the Instructor Survey Instrument (Appendix A). The instructor survey was designed to assess training officers and company officers engaged in the on-the-job learning format. The questions were designed to assess underlying psychological markers which would indicate the qualities of a good instructor. The questions for the instructor survey were also designed to assess the presence of unhealthy makers which may indicate areas for potential improvement. The Instructor Survey instrument was created using a computer-based word document containing researcher fabricated questions regarding instructor qualities. The survey questions were then sampled among some select chief level officers familiar with the research process and other individuals who may have been able to assist with increasing the delivery of the survey. Once the questions were properly formulated and designed to accurately assess the topic, the questions were put into a digital format in the form of the website QuestionPro®. The survey was created with an accompanying brief (Appendix A) describing the survey intent, the

purpose behind the researcher's inclusion and participation with the survey, and an encouragement to answer all questions with honesty and accuracy. The brief also included a note of confidentiality and anonymity. Initially, the survey pool was going to consist of MCFD captains, but due to the small sample size and the potential for inaccurate results based on the relationship shared with MCFD captains and the researcher, the researcher opened the sample pool to outside agencies. The contact pool for the survey was created using email contacts from prior projects, classes, and various trainings the author had engaged in over the past years. The processes of data collection regarding question one took place in the end of May of 2017 and the website was designed to stay active for a two week period. During the active period, the researcher had the ability to review results, but chose to wait until the end of the research period. The researcher sent the link to the survey using email addresses and contact information obtained from class rosters the researcher took part in the past. The intent was to get the survey to officers, ideally company officers or dedicated training officers.

Question number two, how conducive is the on-the-job environment with an effective curriculum delivery, was answered through the use of a data gathering instrument (Appendix C). The data to answer question number two is found by analyzing current data on the question as well as determining how long it takes a firefighter to progress through the on-the-job training format and how often the training is interrupted and cancelled. First, a data gathering tool was used to determine the average length of a training academy (Appendix C). These training curriculums were allocated from Salt Lake City Fire Department, Unified Fire Authority, and the Utah Fire and Rescue Academy (UFRA) by directly calling the organizations or by finding the information on their respective websites. Next, answering question two involved the need to assess how often training sessions were interrupted and cancelled. Data was gathered using the

MCFD Patient Care Report (PCR) data. MCFD utilizes a digital reporting system for all incidents. The data is then stored and can be searched for different qualifiers based on user input. The PCR data survey tool, Appendix C, was a generated search of incident data which interrupted training sessions in a given span of 12 months, from June 2016 to June 2017. The MCFD typically conducts training between the hours of ten o'clock am and twelve o'clock pm, and then again from one o'clock pm to around three o'clock pm each day. Some of the training is formally scheduled classes taught by officer and other firefighters, and other training is improvised by the officer. The data gathering ranges identified, targeted the previously identified timeframes in an effort to determine how often these blocks of time were interrupted. The data from the PCR program was accessed by the researcher in June 2017. The data consisted of the entire organization, but was then further broken down to reflect the probabilities and statistics of the single stations. When assessing the devalue of distraction, the research also touched on the detriment of sleep deprivation and learning. Data regarding the incidence of sleep deprivation during training was collected in the same manner as interrupted learning by assessing how often crews were called out during the night before training. Using the PCR data reporting system, the author searched the data ranges from May 2016 to May 2017 and documented how often the crews were called out, specifically on the first night of a 48 hour shift. The data was then computed to reflect only nights in which training would occur the next morning, not nights in which responders would return home and rest the next morning. The data was accounted and is reflected in appendix C. The third aspect to the data was to analyze how long it takes to complete a firefighter academy. Using organizations websites, the researcher searched for characteristics regarding an hourly figure which would suggest how many hours are associated with academy completion. The organizations who consistently operate a firefighter

academy are the Salt Lake City Fire Department, the Unified Fire Authority, and the Utah Fire and Rescue Academy.

Question number three, what are the potential safety hazards associated with allowing firefighters to operate within the normal ranks during on-the-job training, was primarily answered using data gathered searching National Institute for Occupational Safety and Health (NIOSH) firefighter fatality reports (Appendix D). The NIOSH data was retrieved from the NIOSH data base accessible at the organization's website https://www.cdc.gov/niosh/fire/default.html. A detailed search was created to fit certain inclusion criteria. All firefighter fatalities occurred on the scene of a fire, and all firefighters died of a traumatic nature. The results contained 150 firefighter fatalities which occurred from 1998 to 2015, in the United States. Some of the incidents involved multiple firefighter fatalities, and such cases, were still included in the general data gathering. Once the 150 cases were identified, each was opened and analyzed. Of all the material, the researcher sought to identify two characteristic sections of the reports being, (1) the contributing factors to the firefighter's death, and (2) key recommendations to be taken from the incident. Within each category, the researcher was first analyzing and identifying events in which a lack of training was a contributing factor to the fatality of the firefighter. Secondly, the researcher was identifying how often training was a key recommendation in the aftermath of the fatality. Strict standards were practiced in determining what incidents held the contributing factor of a lack of training. Only instances in which training was directly mentioned in the report were qualified in the training. This data was then combined with previously researched material outlining the optimal safety environment in fire service training. As incidents were extrapolated, a simple tally was kept by the researcher to denote the positive or negative occurrences of key indicators. The combined

data and previously searched research was used to delineate how safety and training are an integral aspect to firefighter wellbeing. All sources used for answering the research questions conformed to the same standards of relevancy consistent with the literary review. No new information was added without it being included and described in the literary review section.

Research question number four, what are other organizations of similar size doing to provide effective training delivery, was primarily answered through the use of an open ended survey presented to outside organizations. The survey questions (appendix B) was designed to simply ascertain how organizations of similar size and structure were fulfilling firefighter training requirements. The survey was crafted utilizing a Word® document and later transferred to an online survey format utilizing the QuestionPro® software. In the month of June 2017, the Organizational Survey (Appendix B) was methodically sent to fire and emergency service organizations pre-selected by the researcher. The qualifications for survey inclusion were based on organizational size, and emergency service discipline, being fire and emergency medical response as a career organization. For the purpose of comparison, the survey focused on selecting organizations described as career service, with two to four operational stations, and whose services are described as fire and emergency medical response. Organizations who operate as volunteer or part-time paid were not considered as comparable for research purposes, as they do not reflect the research problem scope addressed in this research. The survey was sent to email addresses obtained through the organization's webpage. In an effort to obtain a considerable sampling pool, the researcher sent the survey to organizations within and outside of the researcher's state of residence. Along with the attached link for the survey, each email contained an introductory brief (Appendix B) describing the research project and an invitation to participate. The results of the survey were largely attributed to answering research question

number four. At the end of the survey, organizations were asked if they could be contacted for further questioning, and in the case of four survey responses, the researcher did in fact contact the organizations to understand their approach to training. The intent of the survey was not to simply categorize surveyed organizations, but to identify which organizations were approaching the training subject differently. The survey was used as a vehicle to select organizations for further questioning.

As research questions and procedure credibility were of high importance, the previously mentioned processes were first sampled among selected Chief Officers, fellow EFO students, and contacts in the psychology industry. Suggestions obtained during this phase were considered and implemented as applicable. Once the survey period opened and data was actively being collected, any revision suggestions were not implemented.

The research conducted in this analysis was designed to assess the efficiency and relevancy of the on-the-job training delivery method as prescribed by the MCFD. Many of the focuses were based on the psychology of learning and retention in the fire service. Given the nature and direction of the study, there are a number of intrinsic limitations which arise. First, the survey is primarily focused on the actions, traditions, and capabilities contained within the MCFD. While other organizations may replicate the procedures, the results contained in this survey represent the operations, mindsets, and cultures of the MCFD and surrounding organizations who added to the data gathering. As outside researchers take on the project, they may encounter different results, which may be beneficial in helping them determine the underlying processes of their environment. While some of the material researched in this analysis may apply to other environments, it is not designed to be reflective of the fire service as a whole.

This analysis utilizes the survey data gathering approach, which poses certain limitations in the accuracy of respondents. The survey tool (Appendix A) was delivered to members of the MCFD and other individuals the researcher shared relationships with. Each member who responded to the survey tool has a close connection to the researcher. As that relationship exists, there also exists the potential to skew responses, or deliver responses which they feel are the "right" or "correct" answers. Each respondent was encouraged to answer questions as truthfully as possible, but there still exists that potential for misrepresentation.

Much of this research involves taking well documented and researched aspects of educational psychology and applying them to the fire service. The fire service has largely been very separated from such research and to apply the processes of one service to another can present some limitations in feasibility. Most educational psychology studies have been researched and applied in the confines of the traditional classroom. While the research has impetus and relatedness to the same classrooms of the fire service, some principles of educational psychology do not fully represent education in fire service psychology.

Final limitation to the overall data collected in this research has to do with the research pool available for study. In order to make a potential impact on the operations of the MCFD, the survey and analysis structure needed to represent the MCFD and surrounding agencies. Unfortunately, this representation was quite small based on research pool standards.

Results

This research revolves around the impacts of quality training and the ability to provide it within the different fire service delivery formats. The research is largely structured by analyzing how educational practices and educational psychology are applied to the fire service training

structure. The results listed are reflective of the manner in which educational principles manifest in the fire service.

Research question one analyzed how effective on-the-job instructors are in their ability to provide effective training? The research question was primarily answered through a thorough analysis of current literature regarding the subject, as well as the Instructor Survey Instrument (Appendix A). The instructor survey was sent to fire service officers within the MCFD as well as company officers through varying email lists and fire service contact groups the research had availability to. In total, the survey was sent directly to 57 email contacts, but also contained a message (Appendix A) which requested that the survey be further passed on to others within their contact scope. In total, the researcher was unable to account for how many people actually received the request to take the survey along with the accompanying link to the electronic survey. The researcher did have access to how many people viewed the survey, as well as how many responded to the questions. The survey link was visited a total of 47 times, with a completion rate of 42 surveys or 87%. The survey results were as follows. Assessment tool number one was a qualifier question assessing the current assignment of the survey taker. "What is your current assignment?" of the 42 respondents, 34, or 81% indicated that they were a company officer; three of the 42, or seven percent indicated they were a training officer; one was a chief officer, and two indicated "other" as an option (Figure 1). Assessment tool number two, how often do you act as an instructor (formally and informally), five of the 42, or 12% indicated they instruct on a daily basis; ten of the 42, or 24% indicated they instruct on a weekly basis, 19 of the 42, or 45% instruct on a monthly basis, and eight of the 42, or 19% instruct less than monthly (Figure 4). Assessment tool number three, do you enjoy teaching, training other, and educating, yielded the feedback of 12 out of 42, or 29% indicated they do enjoy training, and 30

out of 42, or 71% indicated that they do not enjoy training (Figure 2). Assessment tool number four, do you feel you have adequate time to prepare material for training, 17 of the 42, or 40% indicated that they do have enough time to prepare training topics, and 25 of the 42, or 60% indicated that they do not have adequate time to prepare for topics (Figure 3). Assessment tool number five, do you feel you have an adequate environment for training i.e. props, equipment, spaces, of the 42 respondents, 18, or 43% indicated that they do have adequate environmental conditions, and 24 of the 42, or 57% indicated that they do not have requisite environmental conditions to make for proper training (Figure 5). Assessment tool number six, do you feel like you are able to provide training which is of high standard, 21 of the 42, or 50% indicated that they feel like they are able to provide high quality training, and 21, or 50% indicated that they feel like they are unable to provide high quality training (Figure 6). Assessment tool number seven, do you feel like you are able to deliver the same quality of instruction as may be found in other organizations and academy settings, of the 42 respondents, 13 of the 42, or 31% indicated that they felt their training was equivalent to an academy setting, and 29 of the 42, or 69% felt their training was not equivalent to a training academy setting (Figure 7).

Research question #2, how conducive is the on-the-job environment with an effective curriculum delivery, retrieved data by analyzing the prevalence of distracted learning variables (appendix C). The variables identified were training interpretations in the form of emergent call-outs and the potential for sleep deprivation. In the form of emergent call-outs, the data resulted in the following figures. First, the MCFD conducts training at two different intervals during the average work day; first is from ten am to noon, and the other is from one o'clock pm to three o'clock pm. Data recovered from June of 2016 to June of 2017 showed that from the hours of ten o'clock to noon, there were 586 emergent runs, which represents a 53% chance of being

called out by an individual station (Appendix C). The hours of one o'clock to three o'clock data yielded 673 emergent runs, equating to a 61% of being called out (Appendix C). Each percentage was representative of a single station break-down, not a citywide figure. The second aspect to the distraction variable is the occurrences of training occurring after losing sleep the night before. From June 2016 to June 2017, the MCFD responded on 1,326 emergent runs between the hours of 11 o'clock pm to seven o'clock am (Appendix C). As half of the MCFD training occurs on the second day of a 48 hour shift, crews had a 60% chance of attending training after having disruptions in sleep the night before (Appendix C). The third part of the data collection for question number two involved researching how long it takes to complete a firefighter training curriculum. Firefighter training curriculums were obtained from the Salt Lake City Fire Department, Unified Fire Authority, and the Utah Fire and Rescue Academy. The Salt Lake City Fire Department operated a training academy with 520 contact hours, the Unified Fire Authority operated their academy with 600 contact hours, and the Utah Fire and Rescue Academy operated with 360 contact hours per student (Appendix C).

Data gathering for research question number three involved analyzing and studying NIOSH firefighter fatality reports (Appendix D). The researcher was investigating the incidence of death in which training was listed as a contributing factor in the cause of death. The research pool consisted of 150 fatalities from the span of 1998 to 2015. Of the 150 cases analyzed 117, or 78% listed a lack of training, lack of competency, or lack of operational readiness due to a lack of education as a contributing factor to the firefighter fatality (Figure 13). Of the 150 researched cases, 134, or 89% listed a need for training as a key recommendation following the firefighter fatality and as a means to prevent subsequent incidences of death and injury (Figure 14).

Data utilized for research question number four was collected in June of 2017 utilizing the organizational survey instrument (appendix B). In total, the survey was sent to 32 organizations via email. The email contained the welcome text (appendix B) and the accompanying link to the QuestionPro® survey platform. Of the 32 invitations sent, 20, or 62% took the survey to completion. The results of the survey were as follows, assessment tool number one, is your organization fully career, 19 of the 20, or 95%, indicated that they were full career; one of the 20, or five percent indicated that they were part-time (Figure 8). Assessment tool number one was a qualifier question used to assure accurate qualification into the data; the question held no bearing on the research results. Assessment tool number two, what is the size of you organization? Of the 20 responses, 18 of the 20, or 90% indicated they had a structure with two to four stations; two of the 20, or 10% indicated that they were a single station organization (Figure 9). Assessment tool number three, does your organization have a dedicated training officer? 12 of the 20, or 60% indicated that they had a dedicated training officer in place; eight of the 20, or 40% indicated that they did not have a dedicated training officer (Figure 10). Assessment tool number four, who is tasked with delivering the majority of firefighter training? Eight of the 20, or 40% indicated it was the duty of the training officer; six of the 20, or 30% indicated it was the duty of the company officer; two of the 20, or 10% indicated it was a duty of the battalion chief, and four of the 20, or 20% indicated that none of the answers reflected how their organization is structured to train their firefighters (Figure 11). Assessment tool number five, is the majority of firefighter training received on-the-job? 18 of the 20, or 90% indicated that on-the-job training was the preferred platform for training firefighters; two of the 18, or 10% indicated on-the-job training was not the preferred option (Figure 12). Assessment tool number five, if different from the on-the-job format, does your organization approach

training differently? This assessment utilized a “fill-in” answer format to which 14 of the 20, or 70%, left the space blank. Three of the 20, or 15%, wrote, “on the job” or “same” in the space, indicating the similarity in training format previously identified; and three of the 20, or 15% indicated a completely different approach. One of the responses detailed how training was conducted off-duty, another indicated that training was a responsibility of members to complete off-duty, and the third indicated that they had an outside training officer who was not a member of their organization, but was part of a coalition of organizations. Assessment tool number six, may I contact you to get more information regarding your training delivery methods? Of the 20 respondents, eight, or 40% left contact information.

Discussion

The purpose of this research was to analyze and assess the quality and effectiveness of the MCFD firefighter training model. The surveys, questionnaires, data analysis, and literary reviews were used to identify the subtle and often overlooked indicators of effective teaching. Much of the research contained in this analysis is reflective of previously conducted research found in the educational sector, but has been researched as to its presence, relevance, and applicability in the fire service sector. The educational system in the United States takes great strides to providing a product and service which is of high quality, there is much the fire service can learn and adopt by analyzing the overall approach to learning.

One of the first questions assessed in this research was whether or not the officer’s within the MCFD were capable of functioning as instructors for new and regular employees during training sessions. The ingredients to becoming a successful instructor are not happenstance or accident, they are structured and methodical (Williams et al., 2016). As the current training model within the MCFD is based largely upon officers preparing and delivering training, the

officers must be able to maintain a high standard in their ability to instruct. Creating an optimal learning environment is dependent upon a number of variables, many of which are dependent upon the instructor. In the officer's survey (appendix A) instrument number three assessed the level of enjoyment found by instructors in the teaching role. While many formal teachers and instructors are led to the duty by choice and accountability, officers within the MCFD inherit the responsibility through promotion. Of the 42 respondents, 71% indicated that the duties of being an instructor are not enjoyable (Figure 2). Corno and Anderman (2016) indicated that one of the qualities which makes for a great educator is the desire and love of teaching. Developing a desire and love for teaching creates motivation for preparation, a keen sense of awareness in an instructors strengths and weaknesses, and an enhanced delivery of information (Stahl, 2012). Without developing a love and desire to teach, people tend to lose a great deal of effectiveness in their delivery, and lack the intent to succeed as an instructor. Corno and Anderman (2016) also cited that to be an educator is benevolent service which cannot be forced upon someone, but that it becomes an identity which people live up to. As instrument three of the officer survey shows, officers do not generally enjoy the role and mantle placed upon them as instructors (Figure 2). Without that general desire, Williams and company (2016) conclude that people cannot effectively act in the instructor capacity. Without requisite desire, educators are less likely to allot adequate time to prepare material, concern themselves with learning outcomes, and look after the needs to the students (Williams et al., 2016).

Corno and Anderman (2016) attest that being a professional educator is not for everyone. Just as every industry and service delivery draws certain persons of interest, so does the field of professional education. The on-the-job training format currently being employed by the MCFD does not allow officers the choice as to whether they would like to be an instructor or not.

Officers within the MCFD on-the-job training program are required to be instructors on a regular basis, which contradicts much of what is known about the ingredients to being a good instructor. Some of the best instructors are individuals who are drawn to the industry through passion and internal drive (Corno & Anderman, 2016). It also illustrates the notion that despite the best of intentions, some people are not suited to act in the teaching position. The forced approach is not beneficial for the instructor or the learners.

Ross (2014), as well as many other professional sources, have come to recognize the value of preparation and the impact it plays in effective delivery. It is commonly recognized that for every one hour spent teaching, there should be a minimum of three hours spent preparing for the subject (Laird, 2015). Preparation is the foundation for effective teaching. Even when an individual has a thorough understanding of a subject, delivering that information in an effective, appealing, and manageable manner requires time. The Officer Survey (appendix A), instrument number four assessed whether or not officers feel like they are given enough time to adequately prepare for trainings. Of the 42 individuals surveyed, 60% indicated that they felt like they did not have enough time to prepare for training (Figure 3). The high response indicates a severe lack in the learning delivery model. Without adequate time, many officers are forced to improvise and adapt to the demands. While an instructor may know the subject, that does not reflect on their ability to present the subject to others. There is no substitute for well-prepared material (Ross, 2014). The lack of preparation time can be analyzed from a number of perspectives; most prevalent are the lack of desire to prepare, and the second is the inability to allocate time in an already busy day. The MCFD maintains a very busy schedule in regard to call volume, daily activities, prevention work, and miscellaneous duties throughout the day. Time is not a commodity readily available for shift personnel. For an officer to allocate time

toward training sessions, this often means the expenditure of off-duty time, which can be a troubled request based on the individual.

Officer Survey (appendix A) instrument six assessed the general outlook on the effectiveness of training being provided. Of the 42 officers surveyed, only 50% indicated that they were delivering training which met a high standard. The other 50% indicated that they felt like their training was not of high standard (Figure 6). Instructors generally know what constitutes a good instruction and have the distinct ability to gauge their effectiveness (Reeder, 2014).

Referring again to the benchmark of adequate training being characterized as realistic (Weimer, 2012), the instructor survey showed that 57% of the respondents did not have proper environmental conditions to make for a realistic training (figure 5). Realistic learning, also known as authentic learning, is the ability re-create the conditions for real life scenarios. When training is directly reflective of what may be experienced in real life, the trainee is more likely retain the information and respond accurately to real life presentations. When on the other hand, training does not mimic the events found in actual servitude, people are less likely to draw upon their training, but become overwhelmed and disconnected from proper action and decision making (Weimer, 2012).

Given the varied, yet consistent responses from the Officer survey (appendix A), and the literature suggesting what constitutes an effective instructor, the research suggests that the ability to be an effective instructor in the on-the-job format is limited. Officer instructors within the MCFD and similar organizations are simply unable to devote the time required, and lack an acceptable level of desire to make the delivery successful. Williams and company (2016) assert that becoming an effective educator is largely a process which involves adding the right

ingredients to the teaching plan. As long as an instructor understands the material, has a desire to teach well, and allocates adequate time to preparing a structured and methodical lesson, the instructor can maintain effectiveness (Ross, 2014).

Research question number two assessed whether the on-the-job training curriculum could provide an optimal or acceptable environment for proper learning. Rosen cites that an optimal environment is found in a number of variables including an environment free of distractions, realistic, relevant, and demanding for the learner (2012). One of the most detrimental factors to the learning environment analyzed in this research is the presence of distractors (Rosen, 2012). Distractors keep the mind from concentrating, they severely decrease short and long term retention rates, and inevitably make instruction ineffective. Muir, Witchell, McKeever and Kamath (2013) recognize that one of the biggest distractors in the educational setting is when a learner's attention is completely shifted off a topic and required to focus on another task before a lesson can reach conclusion. A complete educational lesson should include an introductory approach, the learning content, a summary, and conclusion. Each section is designed to prepare a learner mind, feed the content, and then solidify the results. The process play into the psychology of learning and when this process is interrupted, retention of the material drastically drops (Williams et al., 2016). Depending on the magnitude of the distractor and frequency of interruptions, some educational objectives can be completely forgotten shortly after learning them. As Rosen recognized that a significant distractor is one which requires the learner to completely deviate their attention, not momentarily, but for a span of time (2012). Such a distractor is often found as firefighters are required to respond of emergent calls while conducting on-the-job training. A firefighter may be engaged in a training, and then abruptly be called out to exercise all their cognitive abilities on the task at hand. When a firefighter returns

after the call, the mind does not simply pick back up where it left off, the distraction actually blocked the mind from processing and storing the learned information in an effective manner, and thereby ushers in the need to start over to effectively retain the information. Distractions are prevalent in the fire service on-the-job training models, and according to Muir and company (2013), they make the learning ineffective. According to the results of the data gathering survey (appendix C), the MCFD responded to 1,259 incidents during training hours. As the MCFD conducts regular training during the hours of ten o'clock am and noon, and again at one o'clock to three o'clock, these blocks represent some of the worst times for incident response and overall training distractions. MCFD units ran a 53% chance of being called out during the hours of ten am and noon, and a 61% chance of being called out during afternoon trainings in the research study (appendix C). Each time the units are called out during training, research would suggest that the training becomes largely ineffective due to the mental distraction (Muir et al., 2013).

The second aspect to the distractions occurs with the sleep deprivation variable. A lack of sleep, even in its minor form, drastically affects student retention rates, attention span, and general behavior in the classroom (Prince & Abel, 2013). The data collection survey regarding night calls and the probability of firefighters attending training with some level of sleep deprivation showed that MCFD firefighters have a 60% chance of occurrence (Appnedix C). Sleep deprivation and learning have been shown to drop short and long-term retention rates drastically (Prince & Abel, 2013).

The pause in training due to emergent call-outs also affects the overall completion of training sessions. As the MCFD largely relies on an on-the-job training format, crew duties, breaks, and obligations are often time sensitive. If a crew gets called out of a training, the call often represents the termination of the training session, as by the time the crew resolves the

incident, the scheduled activities for the firefighters has changed from training opportunities to lunch breaks, scheduled tours, or firefighter downtime. Rarely does on-the-job training take precedent and continue into a lunch break, or other activity.

Optimal learning environments also consists of a certain degree of pressure and stress (Elder, 2013). While stress has often been associated with negative outcomes, stress is ultimately the driving force behind what encourages people to take on certain endeavors, and exert levels of motivation. For the employee, motivation is often found in the pressures to succeed, to maintain their job, and to progress through an organization's structure. Effective learning are stress are also quite connected. When students are encouraged to learn a subject not solely based on the benefits of acquiring the information, but based on the consequences of learning or not learning the subject, students are more likely to learn the information. The fire service has a number of very unique learning environments, some of which are effective and some of which produce opposite results. The intensive academy setting, in which recruits focus solely on development, produces an environment with high consequential learning. If recruits fail to thrive in the academy setting, they face the threat of being expulsed. The threat of expulsion is a very prominent and motivating factor which instills a healthy level of stress. Students in the consequential learning environment are much more likely to take their studies serious and strive to learn the material (Finn, 2013). Inverse to the high-stakes consequential leaning is the learning environment in which there is no high-stakes consequence to the information retained or not retained. This means if a student fails to maintain attentiveness, does not study, and does not participate, they are not faulted in any way. As learning is an active process, those who do not exert any action, they will not learn (Finn, 2013). The on-the-job training model often fails to create any type of environment in which consequences are

prevalent. There are often not tests, exams, homework, or even attendance requirements for the on-the-job training. People are encouraged to attend and be attentive, but if an emergency arises, or distraction surfaces, they are not faulted for not being present.

Stew Smith (2013) analyzed the effectiveness of military boot camps and intensive learning environments and highly emphasized one of the collateral benefits of the grueling learning environments. Military programs are designed to push the body and mind to extreme lengths so that when the body is pushed in actual servitude, the body has experienced such pressure (Smith, 2013). The weeks and months spent in the demanding environment create a tolerance level which empowers individuals to feel comfortable in the environment, free to think more clearly, and open to change and the dynamic flow of chaos. Without the intensive learning period, many people fail to process chaos well as their bodies are not accustomed to the stress. The body is attempting to processes massive amounts of unfamiliar information which is overwhelming. The dynamic and high stress training seen in the military has direct correlation to the fire service. Firefighters are expected to deal with, and process, massive amounts of information on a fire scene. Those firefighters who have trained to an intensive and realistic level, are less likely to be distracted by the general chaos and more likely to focus on the primary dangers and situational awareness needs. The intensive learning environment is not a primary product of on-the-job training as the pressures and realistic learning environment are a product of time and equipment, two variables the MCFD does not currently possess. The instructor survey showed that 57% of instructors are unable to provide for a realistic learning environment (Figure 5), which as per Smith, is one of the foundational variables in providing intensive learning (2013).

Much of the research contained in this report revolves around the value of educational platforms, which carry a resultant high retention rate and the devalue of educational platforms which carry a low resultant retention rate. There is one variable which increases retention regardless of the delivery and that is repeated revisiting of a subject or topic (Kohn, 2014). If a subject can be retaught and practiced on multiple occasions, the material will have a dramatically increased retention rate. This theory applies to intensive and causal learning environments. Unfortunately, the biggest factor in revisiting learned topics is the variable of time. As the incident data (appendix C) showed, time is not a commodity readily available to the MCFD firefighters. Kohn encourages a learning topic be revisited a minimum of four times within a month of the original teaching in order to reach a respectable retention rate (Kohn, 2014). The MCFD, like many other service organizations, has a plethora of learning topics each year. For the MCFD to dedicate four days out of ten per month to a single topic would mean an abundance of learning topics would not get covered every year.

Much of what is emphasized in the on-the-job training program places high value on experiential learning, or learning through experience. While relevant experience is an excellent avenue for increased retention rates among learned material, it also represents a hazard when not properly applied. Experiential learning is only effective when it is coupled with previously received training which can be drawn upon when experiencing the event or incident (McCabe, 2014). If experience is to be used as the sole source for learning, that approach has the potential to promote adverse skill development and outlooks on the subject. The incident data collection (Appendix C), concluded that for the first year a firefighter serves with the MCFD, they are primarily reliant on experience being their source for learning, which can be effective, but only when that experience is backed by foundational learning. Foundational learning can be in the

form of an academy experience, previous training, or prior experience. Either way, organizations like the MCFD should be providing a baseline level of education prior to allowing experience to shape, or misshape, the firefighter's behavior.

Research question number three analyzed what are the potential safety hazards associated with allowing new firefighters to operate within the normal ranks during on-the-job training? With a service industry as hazardous as the fire service, knowledge and awareness are absolutely essential in preventing firefighter injuries and deaths (Ford, 2012). Given the best equipment and a courageous capacity to place oneself in harm's way are not nearly important or impactful as being properly qualified and prepared to take action under stress (Ford, 2012). Training does not simply represent the passive allocation of information, it represents the knowledge of how a firefighter can keep themselves safe (Merrell et al., 2008). Training is absolutely essential to the longevity of the firefighter from an operational standpoint as well as a wellness standpoint. The research for this question identified a number of startling discoveries. The first set of variables researched the impact of proper training on documental line of duty deaths in the NIOSH reports. Of the 150 NIOSH firefighter fatality reports, 78% of the fatality reports indicated a lack of training as a contributing factor to the firefighter's death (figure 13). Each report does not conclude that a lack of training is what killed the firefighter, but in each of the 78%, the lack of training was and in part contribution (Figure 13). Well trained firefighter have decreased injury rates, decreased line of duty death rates, and increased overall wellness. To be a safe firefighter is to be a well-trained firefighter. As Boser (2017) cited, a firefighter does not rise to the occasion of a monumental event, they revert to their lowest levels of training. The NIOSH survey also reviewed the prevalence in which training was a key recommendation following a line of duty death incident. Of the 150 incidents reviewed, 89% made a recommendation that

training be a part of the recovery process and a means by which subsequent firefighter fatalities are avoided (Figure 14).

The MCFD, and other similar organizations, take on considerable levels of liability when they adopt an on-the-job training model as it places firefighters into service prior to reaching minimum levels of competency (Stephens, 2014). The minimum academy experience offers 320 contact training hours (UFRA, 2017). These hours represent a benchmark in which a firefighter has received the minimum levels of training to begin operating as functional firefighter. Other academies offer as much as 600 hours to create a minimally trained firefighter who has the ability to enter servitude (Appendix C). Given the structure of the MCFD on-the-job training format which schedules, on average, four hours of training each day on-duty, it would take a MCFD firefighter eight months to complete the training in an optimal environment. When considering the devalue and prevalence of distracted learning, a MCFD firefighter may take as long as 16 months to complete the foundational learning required to function as an entry level firefighter. As the 320 contact hours is a minimum level of training, other organizations are requiring 520 to 600 hours of entry level training, which for the MCFD firefighter, would take over two years of on-the-job training to reach that level, and then even longer given the distracted variable. During the time in which firefighter is engaged in the on-the-job training model, a firefighter is still exposed to the dangers of the job just the same as a highly trained firefighter. To place a relatively untrained firefighter in service is a gamble, as is evident based on the dangers exposed with the lack of training and firefighter fatalities.

Monroe cites that the initial investment of training a firefighter is just that, it's an investment (2016). Well trained firefighter have decreased injury rates, decreased line of duty death rates, and increased overall wellness (Merrell et al., 2008). To be a safe firefighter is to be

a well-trained firefighter. When that foundational training level is low, a firefighter runs the risk of performing at a subpar level of execution. When, on the other hand, a firefighter has a solid level of foundational training, that firefighter has a higher probability of successful and safe outcomes. This principle also applies to the manner in which an organization takes care of their own personnel. The military standard known as the doctrine as a codification of beliefs is the organizations obligation to make sure soldiers are properly, trained, equip, and properly led, prior to engaging in the dangers of the service (Ford, 2012). The codification standard represents a right for each individual engaging in a dangerous service, such as the fire service. As long as responders engage in dangerous activities, it should be their right, and duty of an organization to assure they have all the requisite tools needed to survive. The placement of firefighters "on-duty" prior to a complete training regimen is a dangerous venture given the fact that the firefighters constantly face the threats of the service, but lack the complete knowledge of what to do.

Given the impact of distraction, a more sinister product of distracted learning begins to surface. When people's attention is constantly removed or distracted by an improper learning environment, their minds being to fill in the gaps of information which have been missed (Rosen, 2012). In many cases, this is seen as people walk away from a class or curriculum feeling like they were able to retain the information, but then fail a test. For a firefighter, piecing together missed information can be detrimental. A firefighter may take a class in which the topic of aggressive firefighting is presented. If the firefighter is subconsciously forced to piece together bits of the class due to distracted learning, they may walk away from the class with the impression that interior firefighting efforts are the preferred choice of firefighting, when in fact the class held the objective of identifying *when* interior firefighting is the preferred choice and

moreover, when it is not. This research showed that the potential for this processes is potentially occurring in over 50% of the training sessions MCFD firefighters are engaging in (Appendix C). Firefighter training, and the manner in which it is completed must be well orchestrated as to teach people correct principles, free of doubt.

Research question number four was designed to analyze what different approaches are being taken to provide adequate training for first responders, without the distractions and difficulties of the MCFD current model. Utilizing appendix B, the survey yielded some characteristic, and not-so-characteristic outcomes. Of all the organizations of similar size and structure, 40% have the same training format and platform as the MCFD (figure 10). This result was not surprising or impactful as the survey is seeking to identify the non-traditional methods for teaching firefighters. Of the respondents, 28% have a dedicated training officer whose primary duty is to research, prepare, and deliver training to career firefighters on a daily or weekly basis (Figure 10). The presence of a full-time training officer is a luxury for many organizations and is considered to be one of the optimal delivery methods in the educational environment (Williams et al., 2016). Of the remaining 10%, there were a few innovative training techniques being employed (Figure 12). One organization decided to forego attempting to provide formal training on-duty, and made the initiative to “hold” their personnel over. This process involved having firefighters stay a few hours after their shift had ended and attend mandatory training. This approach eliminated the distractions of being on-duty, and it offered the instructor the unadulterated time to fully immerse attendees into the training topic. One organization also decided that the on-the-job training was becoming ineffective and decided to move primarily to a web-based leaning platform which firefighter could access at any time. The online based learning consisted of movies, case studies, and pre-designed lessons which

firefighter would individually work through. The lessons were assigned to each firefighter to complete, and accountability was placed on each firefighter to complete the training modules. The approach to training offered the luxury of skillfully prepared topics delivered on demand, at any time. The online training platform was also designed with didactic portions which could be implemented by the station officer in the form of evolutions, hands-on-training, and field work to accompany the academic portions of the training. The last characteristic approach to training involved one organization's decision to largely abandon on-the-job training altogether. The organization would conduct small spot trainings where members would review things already learned, but they did not conduct full-scale training initiatives. Instead, the organization placed emphasis on members attending outside training events throughout the year. The organization was characterized as neighboring a metropolitan area in which training availability was abundant. Each firefighter was encouraged, and facilitation was made for each firefighter to attend training as a means to fulfill education and learning needs. Finally, one organization had developed a unique and efficient means to provide training though the use of a full-time training staff, which was shared by multiple organizations. A conglomeration of small organizations recognized the value of quality training, yet were hampered by the financial burden associated with training, and entered an agreement with the surrounding agencies to share the financial burden. The training association was composed of six organizations ranging from one to three stations, and a combination of career, part-time, and one volunteer organization. Each organization allocated a sum of money proportionate to their training needs, and created a training branch of two career, and one part-time volunteer firefighter to staff an association training bureau. The training staff created and managed a common training program which delivered weekly formal in-class offerings, hands-on applications, and large scale drills in the

disciplines of firefighting, EMS, hazmat, and specialty rescue. The organizations were able to take the benefits of having dedicated instructors, yet distribute the negative costs among other organizations.

Question four of the research identifies two major important points in regard to the research. First, organizations similar to the MCFD are applying unique and creative approaches to training, which adhere to many of the benchmark principles encouraged by educational processionals (Willams et al., 2016). The MCFD, and similar organizations, can utilize these formats as structured roadmaps with probable success. Second, the research ultimately enforces the need for organizations like the MCFD to begin looking at more creative solutions to firefighter training. Much of what the educational sector is doing is innovative, unique, and modern as shaped by research; the fire service needs to structure training is similar fashions.

In summation, this research sought to identify the effectiveness of on-the-job training within the MCFD and areas for which to improve it. The organizational implications for this study are quite important as training is a tool firefighters engage in as a means to keep themselves safe (White, 2015). Improper and inadequate training leaves a firefighter more vulnerable to the dangers of the service (Shaw, 2013). Ultimately, this research focused on the value of retention and the ability to retain learned information. The MCFD utilizes the on-the-job training platform as the primary source for training, which has been shown to be ineffective in very busy organizations. The use of the model has organizational implications including ineffective instructor implications, inability to create intensive learning environments conducive with an authentic learning, and is heavy laden with distractions. These variables produce a learning environment with drastically lowered retention rates. This research shows that if on the other hand, the MCFD organization was to investigate other avenues for training and education,

they can quite effectively develop training deliveries which foster effective instructors, create realistic learning environments, and increase learning retention to meet average rates comparable to other learning platforms. Such recommendations will be outlined in subsequent sections to follow. Overall, the results of this research on the MCFD show potential areas for positive growth and development which will increase firefighter safety and general retention of learned material.

Recommendations

The research conducted in this study analyzed how widely used educational psychology principles can be applied to the fire and emergency services. Industries such as the fire service have long been successful in training their members, but the research contained in this report shed light on the manner in which that training is effective and what is less effective. Overall, on-the-job training contains a significant amount of distraction and places an inordinate amount of responsibility on front line supervisors, regardless of their teaching competency. The following recommendations reflect areas for potential improvement in the training delivery, areas for continued research, and existing operational teaching options. Each of the recommendations reflects the results of the research contained previously in this report, and is catered to meet the needs of the MCFD. Each fire and emergency service organization may benefit from the information contained in this report, but it should be modified to meet the specific needs of the organization.

The MCFD is fortunate to be a part of a larger system of fire and emergency service organizations who have always been open to collaboration. The MCFD should look at potential partnerships in the training efforts. First and foremost, the MCFD should utilize the open invitations to allow newly hired employees to attend recruit hire camps. The on-the-job training

format creates certain liabilities for an employee and an organization; by providing dedicated, structured, and non-distracted training up front, both the employee and organization benefit.

Much of this research revolved around the quality, effectiveness, and impact of the company officer's ability to act as an instructor. Unfortunately, very little is done to prepare and develop officers in the instructor role in the MCFD. It would be quite advantageous to implement a series of instructor development courses which focus on lesson preparation, presentation, evaluation, and general success as an instructor. Part of the suggested curriculum should explain the important role of the instructor and the manner in which it impacts firefighter safety, injury prevention, and efficiency.

The MCFD should begin looking at alleviating the training demands on the company officers. Some of this research was dedicated to identifying the methods and manners being employed by other similar organizations as that of the MCFD. While no definitive recommendation can be made as to what may be applied, it is recommended that the MCFD assess the feasibility levels of increased training officer staff, creative training delivery options, consolidation options with surrounding agencies, and outside training opportunities. This research concluded that the current training system is not as optimal given environmental and duty demands, and further action research may be very beneficial.

Authentic learning environments are considered to be very effective, but costly and difficult to create. As the MCFD does not have a training facility, it is recommended that the MCFD seek to enter agreements with surrounding organizations who have training facilities which may be used by MCFD personnel. Again, feasibility studies and further research may be needed to assess how such agreements may or may not work. Having access to training towers

and authentic learning environments will increase the effectiveness of the training delivery and long-term retention rates of learned information.

Some of the distractions identified in this research touched on the detrimental impacts of sleep deprivation and productive learning. As the MCFD operates on the 48/96 work cycle, crews often train on the second day of duty. With the high incidence of night calls, second day scheduled training may represent an ineffective venture worthy of modification. It is recommended that the MCFD adopt an organizational model which places high emphasis on training the first day of duty, and allowing less cognitive activities to be scheduled for the second day of duty. By scheduling training primarily on the first day, firefighters are more likely to be better rested and more receptive to learning.

The MCFD and similar organizations seeking to implement an effective training routine need to apply the principles of consequential learning. This may include providing testing and evaluations after training curriculums, or by offering some sort of reward or punishment for those who devote the time and attention to learning. Non-consequential learning, which is prevalent in the lackadaisical on-the-job training model, yields low retention rates, but can easily be influenced with proper application.

The scheduled time of day in which training traditionally occurs also proved to be a source for significant distraction. The traditional training blocks also represent some of the more busy blocks for emergent calls. The MCFD should assess providing training during different blocks of time. Different options may include earlier in the morning, and later in the afternoon in which call percentages drop as compared to the current time blocks.

Finally, much of the research contained in this essay was structured using research found in the formal educational environment. Schools, colleges, and universities have long delved in

increasing the efficiency and applicability of student learning; the fire service as a whole can greatly benefit from analyzing what is being done in the educational sector as a model for training. The MCFD and other organizations can and should be continually aware of the innovative approaches to learning and implementing them into traditional fire service structures.

While this research does not identify a best-practice solution, it does identify some areas of potential weakness in the on-the-job training model within the MCFD. It is recommended that the MCFD, and similar organizations, deviate from the on-the-job training model as it currently operates, and find a new approach which caters to the high call volume as well as the need to provide quality training.

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Appendix A

Instructor Survey Email Introduction

Hello,

As part of my final year of Executive Fire Officer (EFO) program, I'm completing a research project which seeks to identify ways in which we can improve firefighter training. I need some help identifying a few areas of strength and weakness in training delivery and was wondering if you would take a quick seven question survey for me. All of your responses are confidential and anonymous. The link to the survey can be found at https://www.questionpro.com/a/TakeSurvey?id=5653948

In an attempt to get this survey to as many fire officers and fire instructors as possible, please feel free to forward this email to any fellow fire service members who are in the officer position.

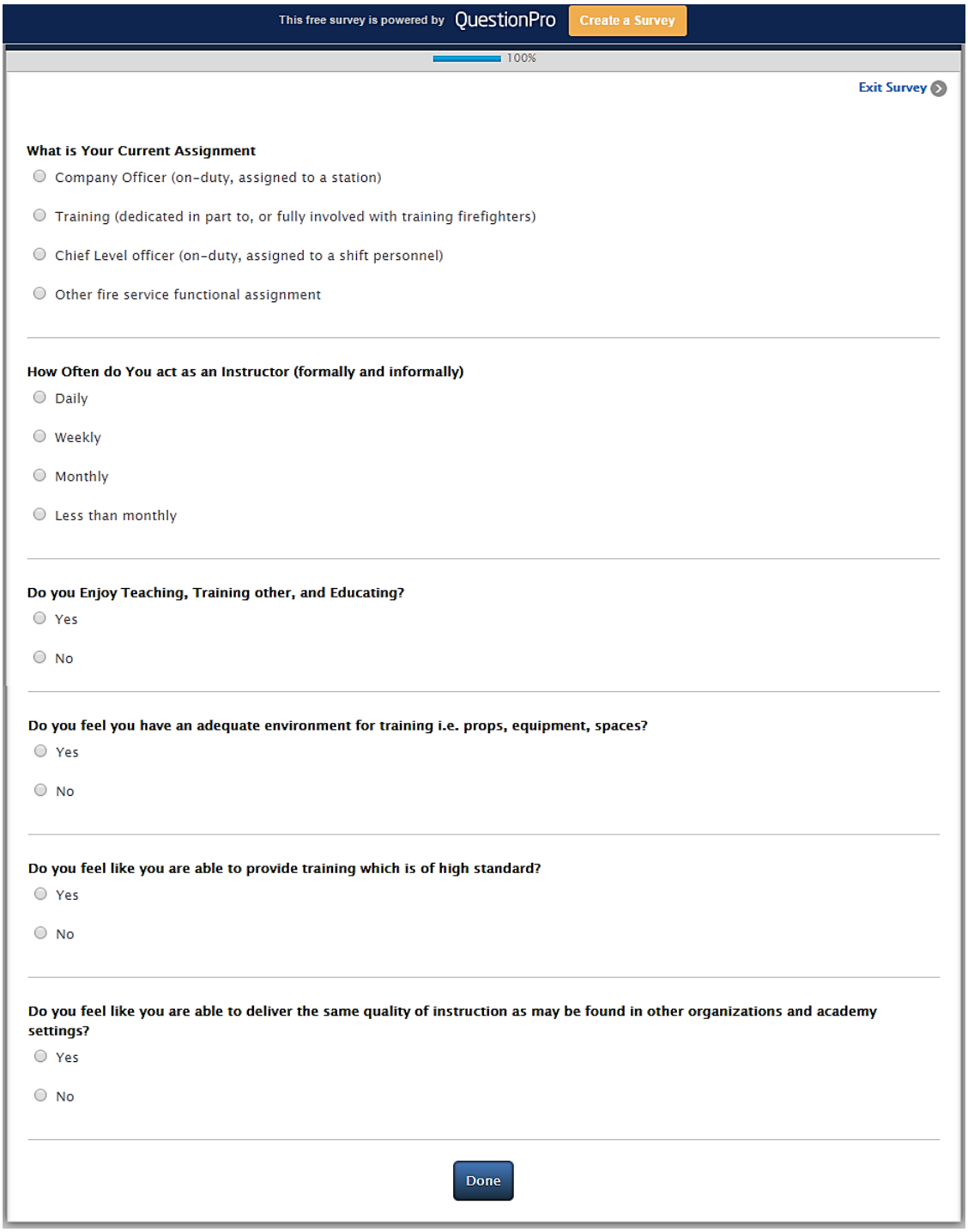
If you would like a final copy of the research report, please feel free to reply to this email.

Thank-you for your help.

Sincerely

Jordon Petersen
Captain
Murray City Fire Department
jpetersen@murray.utah.gov

Instructor Survey



Appendix B

Organizational Survey Email Introduction

Hello,

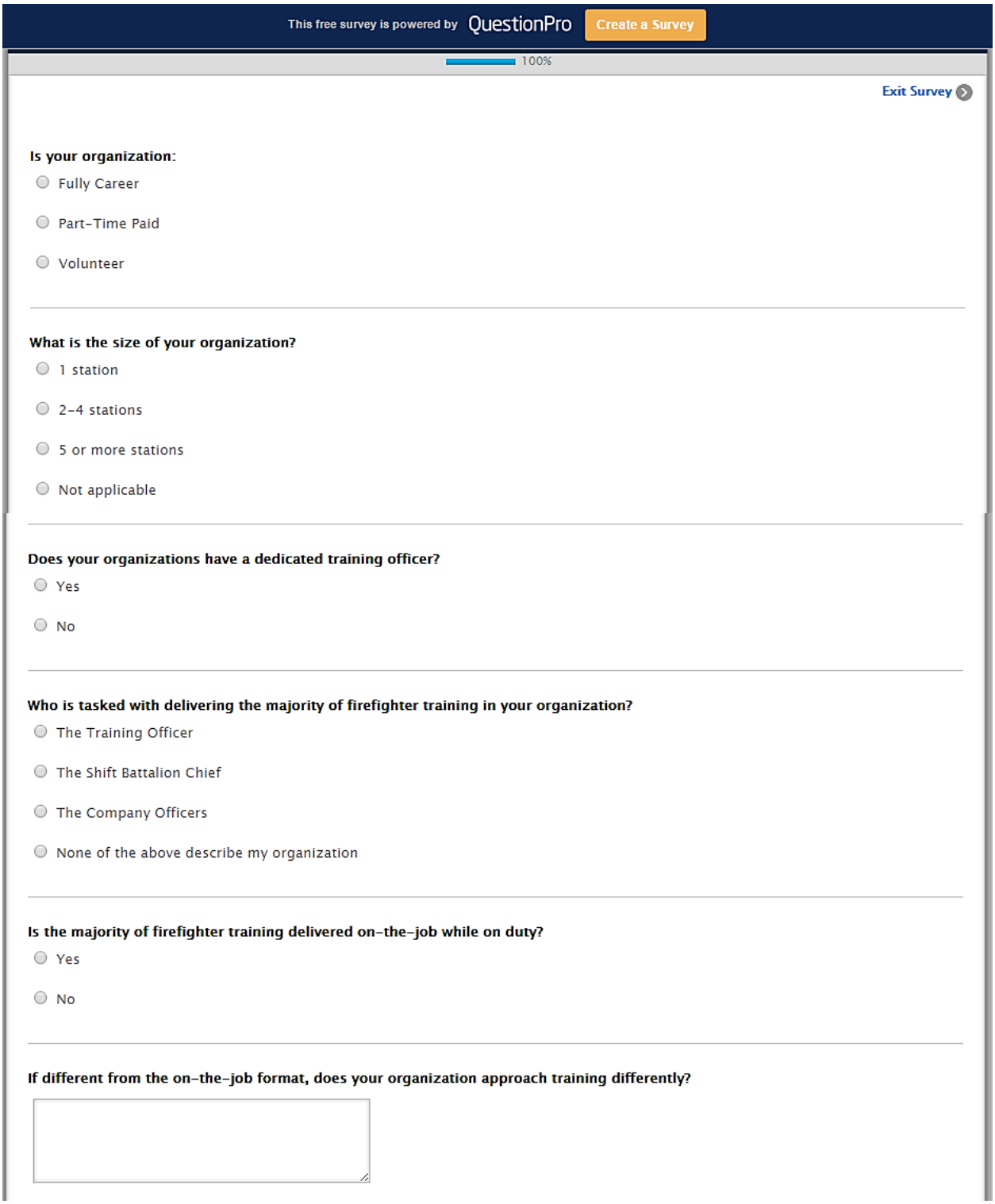
As part of my final year of Executive Fire Officer (EFO) program, I'm completing a research project which seeks to identify ways in which we can improve firefighter training. I need some help identifying a few areas of strength and weakness in training delivery and was wondering if you would take a quick six question organizational survey for me. All of your responses are confidential and anonymous. The link to the survey can be found at https://www.questionpro.com/a/TakeSurvey?id=5653966

Thank-you for your help. If you would like a final copy of the research report, please feel free to reply to this email.

Sincerely

Jordon Petersen
Captain
Murray City Fire Department
jpetersen@murray.utah.gov

Organizational Survey



May I contact you to get more information regarding your training delivery methods?

Name:

Phone Number:

Done

Appendix C

Incident Tracking Sheets

Academy Time Frames and Durations		
Utah Fire and Rescue Academy	Salt Lake City Fire	Unified Fire Authority
320 Contact Hours	520 Hours	600 Hours

Night Call Probability
June 2016 to June 2017

Number of calls between 11pm and 7am	Percentage of Probability
1,326	60%

Incident Tracking

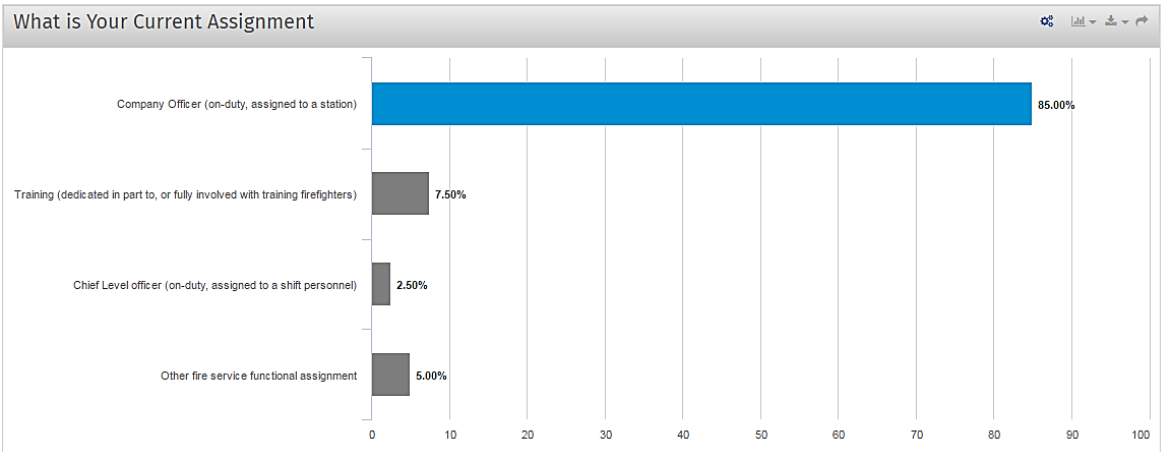
June 2016 to June 2017		
Time of Day	Number of Incidents	Probability of Call-out
10am - 12noon	586	53%
2pm - 4pm	673	61%

Appendix D

NIOSH Report Data

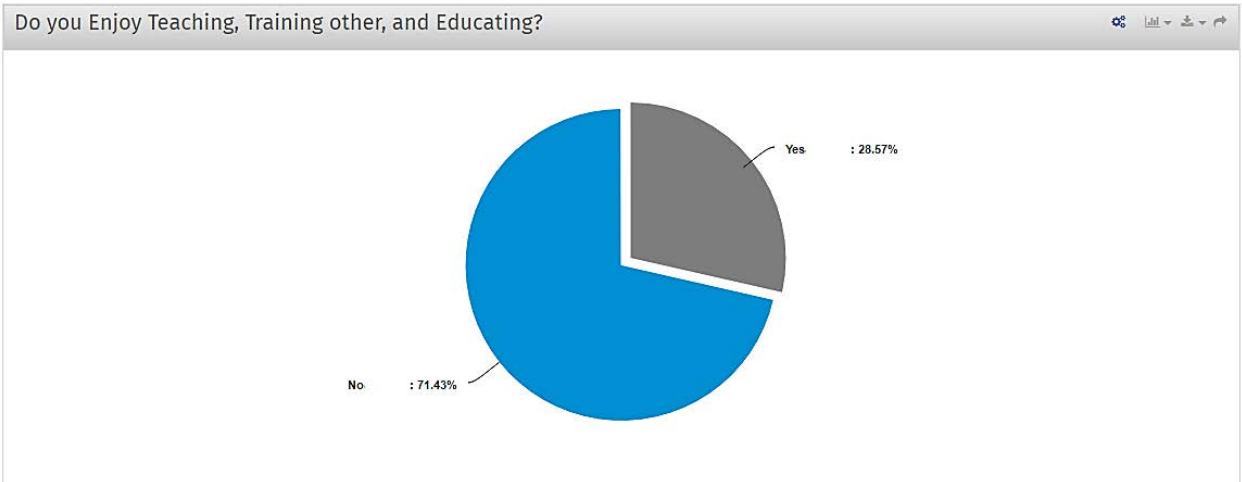
NIOSH Firefighter Fatalities (Traumatic Fire Scene Deaths) 1998 - 2015	
Training Listed as a Contributor to the Firefighter Fatality	117 of 150 = 78%
Training Listed as a Key Recommendation Following Fatality	134 of 150 = 89%

Figure 1.



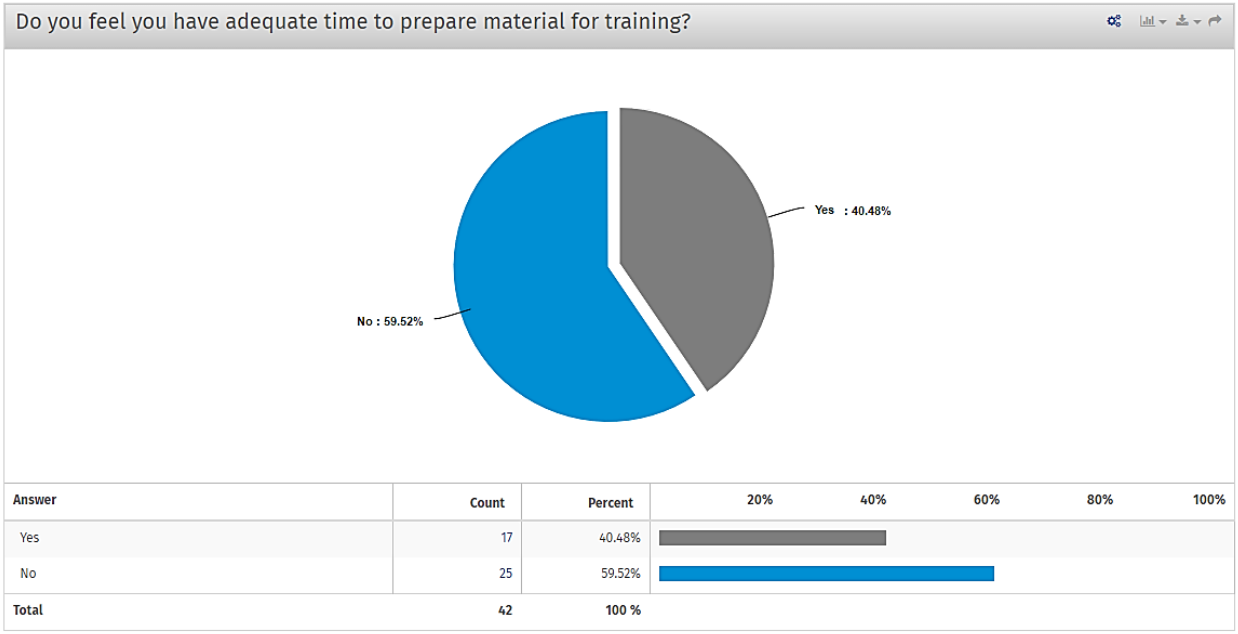
Answer	Count	Percent
Company Officer (on-duty, assigned to a station)	34	85%
Training (dedicated in part to, or fully involved with training firefighters)	3	7.5%
Chief Level officer (on-duty, assigned to a shift personnel)	1	2.5%
Other fire service functional assignment	2	5%
Total	**40**	**100 %**

Figure 2.



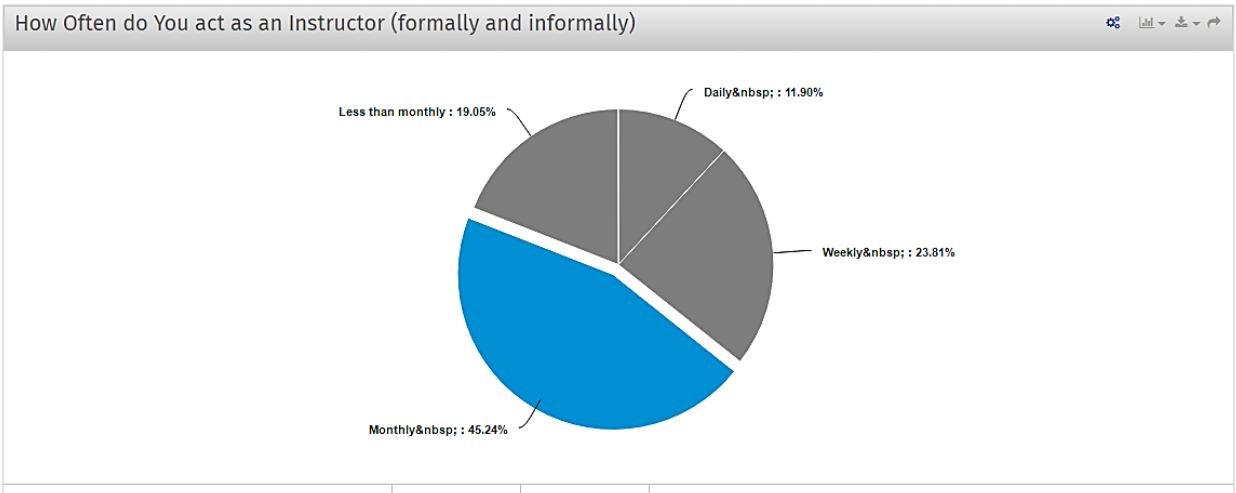
Answer	Count	Percent
Yes	12	28.57%
No	30	71.43%
Total	**42**	**100 %**

Figure 3.



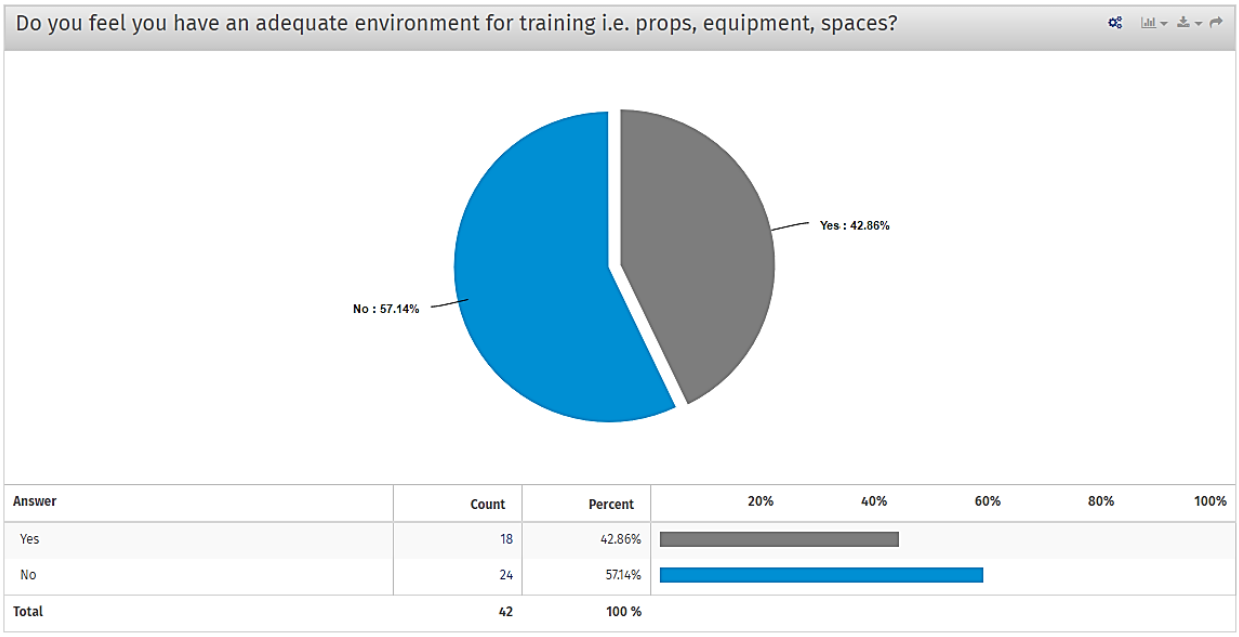
Answer	Count	Percent	20% 40% 60% 80% 100%
Yes	17	40.48%	
No	25	59.52%	
Total	**42**	**100 %**	

Figure 4.



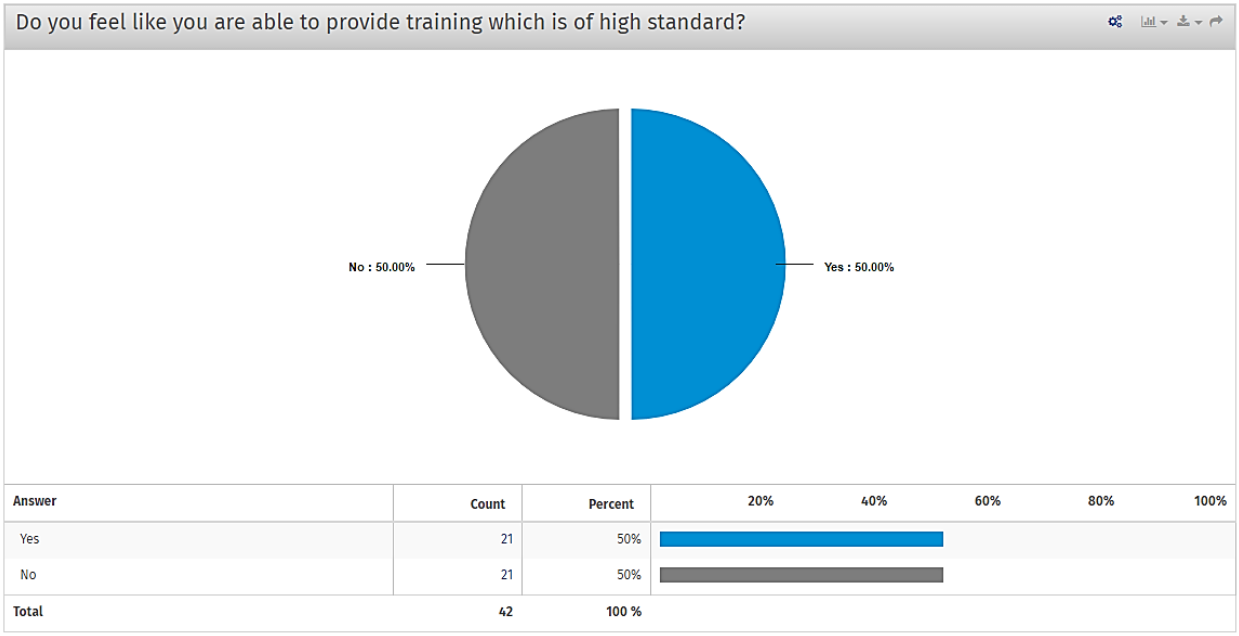
Answer	Count	Percent	20% 40% 60% 80% 100%
Daily	5	11.9%	
Weekly	10	23.81%	
Monthly	19	45.24%	
Less than monthly	8	19.05%	
Total	**42**	**100 %**	

Figure 5.



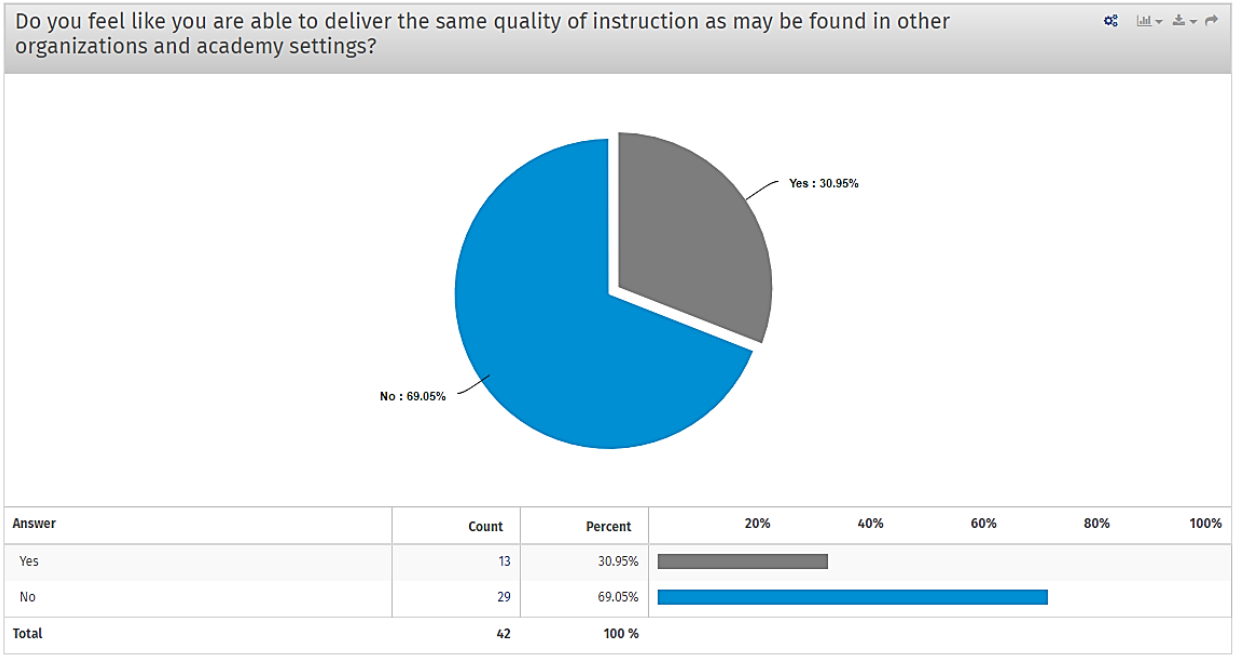
Answer	Count	Percent	20% 40% 60% 80% 100%
Yes	18	42.86%	
No	24	57.14%	
Total	**42**	**100 %**	

Figure 6.



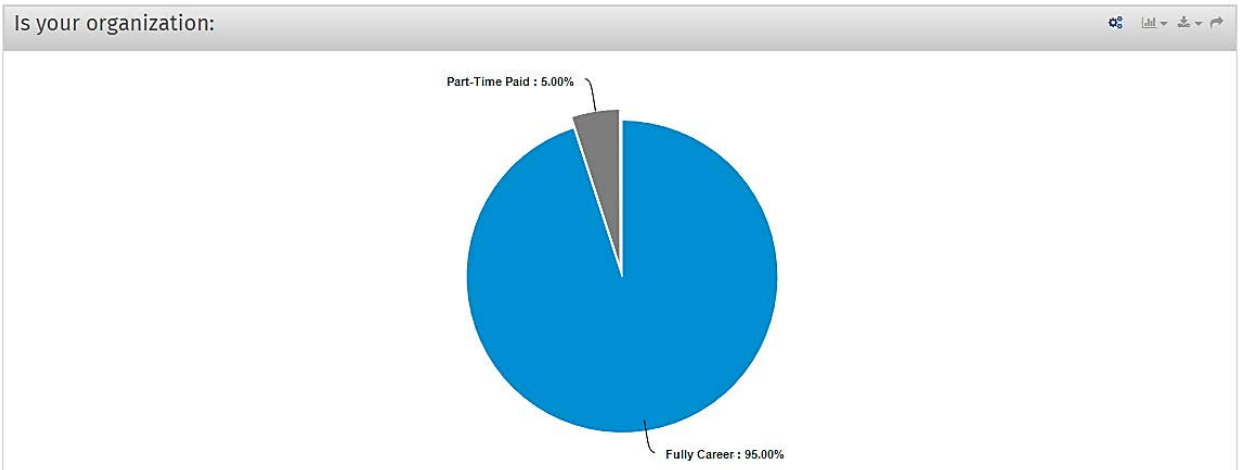
Answer	Count	Percent	20% 40% 60% 80% 100%
Yes	21	50%	
No	21	50%	
Total	**42**	**100 %**	

Figure 7.



Answer	Count	Percent	20% 40% 60% 80% 100%
Yes	13	30.95%	
No	29	69.05%	
Total	**42**	**100 %**	

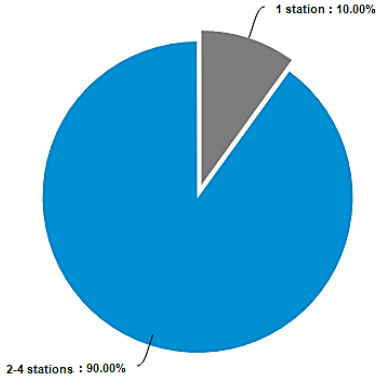
Figure 8.



Answer	Count	Percent	20% 40% 60% 80% 100%
Fully Career	19	95%	
Part-Time Paid	1	5%	
Volunteer	0	0%	
Total	**20**	**100 %**	

Figure 9.

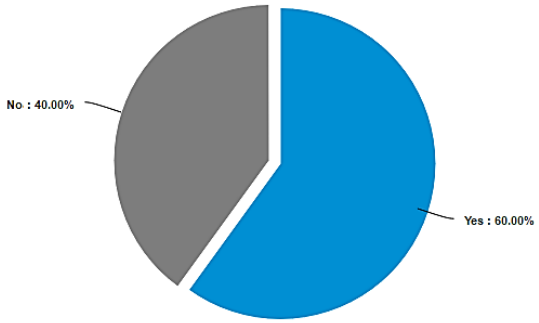
What is the size of your organization?



Answer	Count	Percent	20% 40% 60% 80% 100%
1 station	2	10%	
2-4 stations	18	90%	
5 or more stations	0	0%	
Not applicable	0	0%	
Total	**20**	**100 %**	

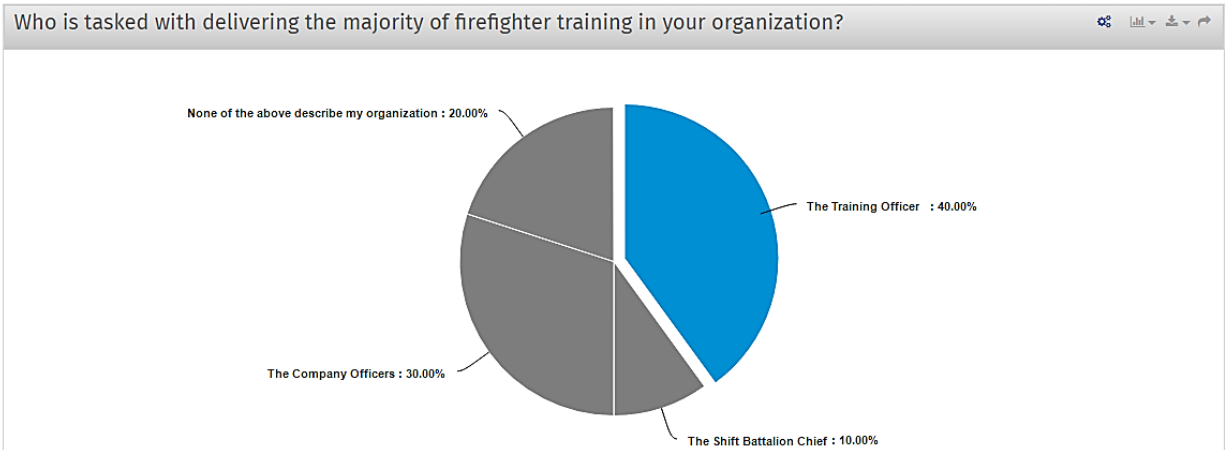
Figure 10.

Does your organizations have a dedicated training officer?



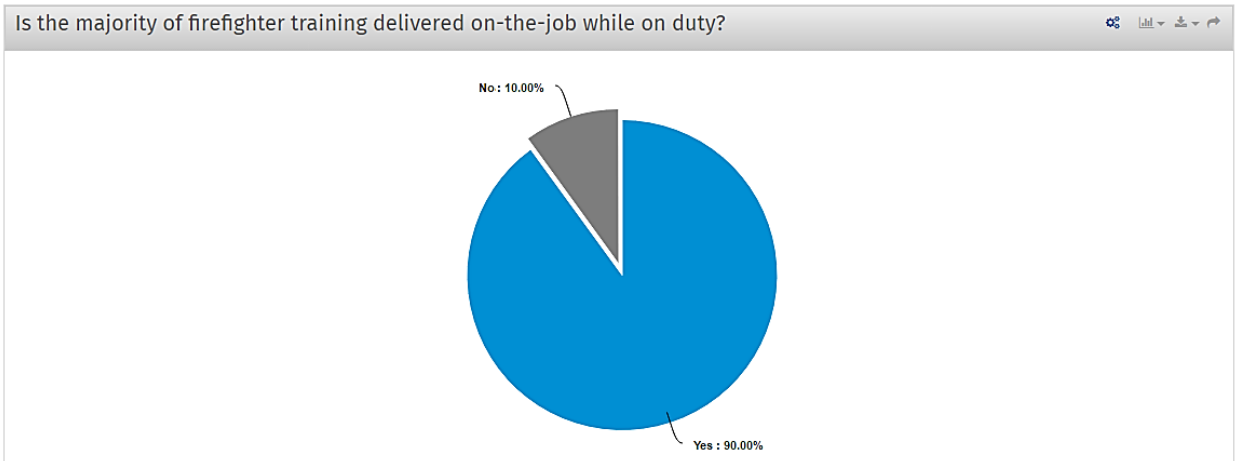
Answer	Count	Percent	20% 40% 60% 80% 100%
Yes	12	60%	
No	8	40%	
Total	**20**	**100 %**	

Figure 11.



Answer	Count	Percent	20% 40% 60% 80% 100%
The Training Officer	8	40%	
The Shift Battalion Chief	2	10%	
The Company Officers	6	30%	
None of the above describe my organization	4	20%	
Total	**20**	**100 %**	

Figure 12.



Answer	Count	Percent	20% 40% 60% 80% 100%
Yes	18	90%	
No	2	10%	
Total	**20**	**100 %**	

Figure 13.

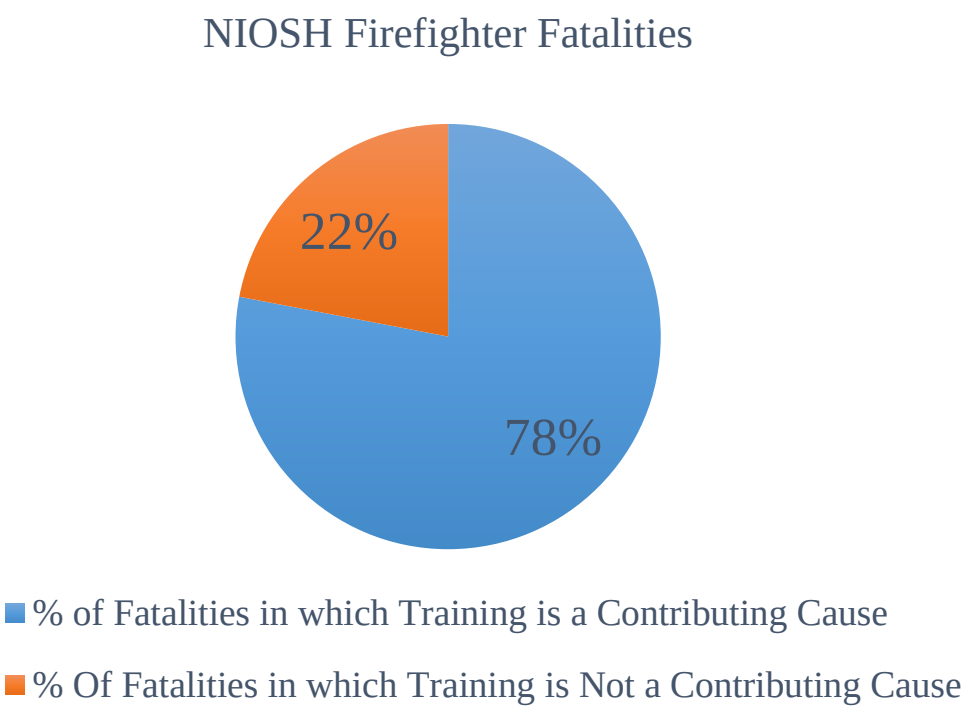


Figure 14.