

**COGNITIVE CONSIDERATIONS  
FOR FIREFIGHTER TRAINING**

**EXECUTIVE DEVELOPMENT**

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Virginia Beach, Virginia

An applied research project submitted to the National Fire Academy as part of the  
Executive Fire Officer Program.

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## ABSTRACT

The problem was the Virginia Beach Fire Department does not provide fire suppression officers guidance on cognitive skills firefighters utilize. The purpose of this research project was to identify cognitive skills firefighters utilize. This was a descriptive research project. The research questions were:

1. What cognitive skills do firefighters use in training?
2. What cognitive skills do fire suppression officers expect subordinates to use?
3. What organizations consider the use of cognitive skills in their training?
4. Should fire suppression officers receive cognitive skills training?

*Doing, listening, and repeating* were the most common responses for the most often used and most beneficial cognitive skills. These same skills were most frequently listed as expected of subordinates. As expected, participants tended to list organizations with which they had personal experience as exemplars of optimal cognitive skill use during training; this kind of background information will be useful when comparing these firefighters to future participants in similar research. A vast majority of participants indicated that fire suppression officers should receive cognitive skills training.

Recommendations for the Virginia Beach Fire Department include establishing a process review team to evaluate training programs currently used by other fire service organizations, adopting a formal training program for its Captains, and conducting further research on cognitive skills in training with other officer ranks and new recruits.

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## INTRODUCTION

Margaret W. Matlin describes *cognition* as the acquisition, storage, transformation, and use of knowledge. Cognition includes a wide range of mental processes such as perception, memory, imagery, language, problem solving, reasoning, and decision making (Matlin, 2002). Since the modern fire service owes the citizens it serves a high degree of performance, fire service agencies must not neglect cognitive issues during the training process. After all, the public has a great expectation for service from its city employees in the time of a major event.

Fire service members of today need to be educated in personnel, technical, and cognitive areas more than at any time in the past. They must be properly prepared and willing to do more than just put water on the fire. Thus, fire service agencies must take every opportunity to increase their knowledge base. The International Fire Service Training Association (IFSTA) states it best:

The training that new firefighters receive is one of the most important aspects of the job. A fire service member's training never ends. New ideas, equipment, and tactics present new methods that must be learned. New materials and technology present challenges that never before existed. It is imperative that the fire service re-main abreast of these changes. (1998, p.12)

The problem is that the Virginia Beach Fire Department does not provide fire suppression officers guidance on cognitive skills firefighters use on the job. The purpose of this research project is to identify these cognitive skills. This is a descriptive research project. The research questions are:

1. What cognitive skills do firefighters use in training?

2. What cognitive skills do fire suppression officers expect subordinates to use?
3. What organizations consider the use of cognitive skills in their training?
4. Should fire suppression officers receive cognitive skills training?

## **BACKGROUND AND SIGNIFICANCE**

The City of Virginia Beach is located in the southeast corner of the Commonwealth of Virginia. It has almost 450,000 permanent residents. Virginia Beach is one of the prime destinations for vacationing on the East Coast. Tourists and visitors make up a transient population of over 3 million persons annually. Virginia Beach occupies a landmass of 258 square miles and has an additional 51 square miles of water and beaches.

The Virginia Beach Fire Department (VBFD) is part of the City of Virginia Beach municipal government. It is responsible for fire protection and operates out of nineteen fire stations. The VBFD staffs twenty-one engine companies, six ladder companies, four battalion chiefs, and both regional technical rescue, and hazardous materials units. The department has 424 uniformed career positions, 27 civilian positions, and a supplemental staff of 64 volunteer firefighters.

The need to train our members comes at a time when the VBFD confronts an unprecedented increase in the number of members eligible for retirement. The VBFD must educate our members today in order to be prepared for tomorrow. “Our profession demands that we will be ready for anything from confined space rescue to structure fires to building collapse. It is imperative that officers prepare valuable and meaningful training sessions that will be the most effective” (Cornell, 2002, p. 103). In addition, the

department must establish and maintain its vested interest in the careers of its junior personnel.

The current requirement for the applied research project of the National Fire Academy's Executive Fire Officer Program was used to complete this research project. In addition, the research project relates to United States Fire Administration operational objective "to promote within communities a comprehensive, multi-hazard risk-reduction plan led by the fire service organization" (NFA, 2002, p. II-2) by fostering optimal education of fire service members to accomplish the objective. Once completed Vbfd staff will evaluate this research project for refinement, expansion, and implementation into our department. Other fire service organizations may find this research useful as a means to develop their own quality training program.

## **LITERATURE REVIEW**

The purpose of this literature review was to gather information from various sources to establish a practical foundation for identification of appropriate elements of a fire department training program.

Adults need to know why they should learn something. Under the more standard pedagogical model it is assumed the fire service member will simply learn what they are told. Adults, however, are used to understanding what they do in life. They want to know the reason they need to learn something or how it will benefit them. For example, fire service members may take a Spanish class to fill a language requirement to complete a degree. However, it is wise for the faculty member as well as the fire service agency to help fire service members understand how they can apply their new knowledge in the future. The required Spanish language lessons will be more affective if the fire service

member feels that it will increase her/his ability to understand a bilingual colleague on the job or to assist citizens whose first language is Spanish.

“Firefighters live in a station as part of the crew but tend to learn as individuals. We learn through personal experience on the fireground, by attending structured classes and training seminars, and through fire station discussions.” (Sandleben, 2002, p. 109)

One way to help fire service members see the value of the lessons is to ask them to reflect on what they expect to learn, how they might use it in the future, or how it will help them to meet their goals. The design of technology-based lessons can incorporate not only the fire service members’ original reflections but can solicit feedback about the relevance of the ongoing learning process throughout the course. It is incumbent upon the instructor to review these reflections and to adjust the technology or suggest an individual lesson structure to more effectively meet fire service member needs.

### **Self-concept**

William H. Maehl, the principal investigator of the Commission for a Nation of Lifelong Learners and president emeritus of the Fielding Institute, states that adults characteristically have a strong self-concept of themselves as individuals and want to manage their own affairs. Scholars and practitioners make these characteristics a recurring theme in their discussions of adult learning, examining adults’ needs to play an active role in their educational experiences (Maehl, 2000). Training programs should be designed to reflect these themes.

Knowles, Holton, and Swanson (1998) emphasize that “adults resent and resist situations in which they feel others are imposing their wills on them” (p. 65). In spite of their need for autonomy, previous schooling has made them dependent learners. It is the

job of the adult instructor to move adult fire service members away from their old habits and into new patterns of learning where they become self-directed, taking responsibility for their own learning and the direction it takes. Technology is a perfect path for the facilitation of self-direction. The ultimate ability of initiatives such as web-based learning to be non-linear allows an adult to follow the path that most appropriately reflects their need to learn. It becomes extremely important for those who are designing technology-based adult learning to use all of the capabilities of the technology, including branching, the ability to skip sections a fire service member already understands, as well as multiple forms of presentation of material to assist people with various learning styles. All of these techniques can be used to permit fire service members to follow a path of learning that most appropriately suits them.

Additionally, learners who are still moving into the self-directed mode may need further assistance with technology-based learning techniques. Those who are new to adult education or who for some reason have not experienced the ability to be self-directed learners in the past need a structure which will help them to grow. Particular attention should be given to fire service members who may not want to spend time outside of a classroom situation, who prefer to be spoon-fed material during a regularly scheduled session. This type of fire service member may exhibit negative opinions of having to use technology as the primary means of learning since they are unfamiliar with taking responsibility and directing their own learning. The instructor must find ways to move these learners into self-direction by giving them short directed concrete online tasks that provide the most “learning for the experience” to make these adults see the relevancy of online learning.



It is also important that self-directedness not be confused with self-motivation. Although a fire service member may be motivated to take a course, they may not be self-directed enough to feel comfortable choosing instructional modules in an online course or creating their own structured environment to learn in a web-based course.

Encouraging self-directedness may also take the form of additional instructor contact in the beginning stages of the class or could be facilitated by having fire service members do technology-based modules within a traditional class before they move to a completely self-directed technology-based course.

### **Experience**

Adults have had a lifetime of experiences. Because of these experiences, adult learners are more heterogeneous than younger learners and have an additional base of knowledge that can and should be used in the classroom or technology-based learning environments. Adults want to use what they know and want to be acknowledged for having that knowledge. The design of technology-based instruction must include opportunities for learners to use their knowledge and experience. Case studies, reflective activities, group projects that call upon the expertise of group members, and laboratory experiments are examples of the type of learning activities which will facilitate the use of learners' already acquired expertise.

An important corollary to the experience that adults bring with them is the association of their experiences with who they are. Their self-identity including habits and biases are determined from their experiences. For this reason, those developing technology-based instruction for adult learners need to create opportunities for what Jack Mezirow calls *reflective learning*. "Reflective learning involves assessment or

reassessment of assumptions. Reflective learning becomes transformative whenever assumptions or premises are found to be distorting, inauthentic or otherwise invalid” (Mezirow, 1991, p. 6). Reflective learning activities can assist fire service members in examining their biases and habits and move them toward a new understanding of information presented. Using web-based or other technologies to have fire service members reflect on learning activities or to put themselves into a different character in a case study or scenario may cause adults to reevaluate already learned information or patterns.

### **Readiness to Learn**

It is important that lessons developed in technology-based opportunities should, when possible, be concrete and relate to fire service members’ needs and future goals. These lessons may be adapted from the goals of the course or learning program as well as fire service member input during the course. In addition, an instructor can encourage fire service members’ readiness by designing experiences that simulate situations where the fire service member will encounter a need for the knowledge or skill presented. Fire service members in a personnel management course may not see the need for learning about the Family and Medical Leave Act during a lecture. However, an interactive role play that puts fire service members in the place of a manager who must deal with an employee’s request for leave due to a child’s illness could help them see how an understanding of the topic will benefit them in the future.

### **Orientation to Learning**

Adults are life-, task-, or problem-centered in their orientation to learning. They want to see how what they are learning will apply to their life, to a task they need to

perform, or to a problem they need to solve. Instruction will be more effective if it uses real-life examples or situations that adult learners may encounter in their life or on the job. Allowing flexibility in the design of a lesson will permit fire service member input on issues that need to be addressed in a class. According to Merriam & Caffarella (1999), “[a]s with participant support, support for education and training activities from immediate supervisors of paid and volunteer staff is best gained by providing worthwhile programs and involving the supervisors” (p. 88).

### **Motivation to Learn**

While adult learners may respond to external motivators, internal priorities are more important. Incentives such as increased job satisfaction, self-esteem, and quality of life are important in giving adults a reason to learn. If any of these can be related as part of technology-based instruction, adults will respond more positively. Activities that build fire service members’ self-esteem, or sense of accomplishment through, for example, the completion of goals or modules that can be checked off in a sequence, may help motivate completion of a longer lesson. In addition, allowing student input into the development of lessons or in the prioritization of topics covered can help fire service members take ownership of the learning process. Adult learners are motivated by instructors who are open to questions and comments, use humor, and interact with the crowd to spark the interest of even the most reluctant participants.

Merriam & Caffarella cite three (3) important areas of importance in the learning process.

1. Participants learn best when new information or skills build on past knowledge and experience.

2. Participants are more motivated to learn when a variety of instructional methods are used.
3. Participants learn both in interdependent, connected, and collaborative ways as well as in independent and self-reliant modes. (1999, p. 39)

“Personal experience increases our knowledge base regardless of whether the situation is positive or negative. It may not be necessary to ‘have’ the experience firsthand. If we see an action and the result of that action, we should learn from it” (Sandleben, 2002, p. 109). Thus, if a process is carefully broken down during training, fire service members will benefit. Thorough explanation can motivate them to remember material because such care would not have been taken in the presentation if the material was not important. Following Sandleben’s logic, the presentation could be of a success or of a failure. As long as the opportunity to conduct a detailed analysis is available, fire service members will learn from the experience.

### **Conclusion**

Learning is a key process in human behavior. Indeed, learning appears to play an important role in virtually every activity we perform. Firefighters use cognitive skills focusing on mental processes such as thinking, learning, remembering, and problem solving. Fire service agencies must use every opportunity to increase the knowledge base of their members. Arguments for the use of technology many times include statements about its flexibility and the ability of learners to move through lessons any time, anywhere, and at their own pace. These arguments also include logical explanations of how learners may adapt the lessons or material to cover what they need to learn and eliminate the material that is not appropriate or that they have already learned. To adapt

to the needs of adult students, technology-based learning must be designed to be interactive, learner-centered, and a facilitator of self-direction in learners.

Instructors who are using adult education concepts in the development of their lessons must also become facilitators of learning. They must structure student input into their design and create technology-based lessons, which can easily be adapted to make the presentation of topics relevant to those they teach.

If these guidelines are followed, the instruction developed will be not only technologically workable but also effective from a learner's perspective.

## **PROCEDURES**

### **Process**

This applied research project employed the action research methodology to identify and review the cognitive skills the fire service recommend for quality training, identify and review the cognitive skills industry recommends for quality training, and determine cognitive considerations for firefighter training. The procedures used for this research project were a review of the literature and a survey of members of the VBFD.

### **Literature Review**

The initial research for this project was conducted in the Learning Resource Center (LRC) located at the National Emergency Training Center (NETC) during August of 2002. It was continued at the Virginia Beach Public Library located in Virginia Beach, Virginia. Additionally, books from the author's personal library were used as reference sources.

Information and reference sources were gathered from textbooks, magazines, and journal articles. Each was evaluated against the research criteria, summarized and included in the appropriate section of this applied research project.

### **Survey Instrument**

A self-developed survey was administered to members in various ranks of the VBFD. Its purpose was to provide data relevant to each of the research questions. The survey was titled *Executive Fire Officer Program, Applied Research Project Survey* (Appendix A). It was sent through the fire department's inside mail system. Each survey was accompanied by a cover letter written on original department letterhead (Appendix B) to encourage the return of the survey.

Survey questions one and two asked about the cognitive skills used by firefighters in their training (research question #1). Survey questions three and seven sought to discover what cognitive skills fire suppression officers expected their subordinates to use (research question #2). Survey questions five and six were designed to find out what organizations the participants believed emphasized cognitive skill use in their training process (research question #3). Survey question four was included to provide data to determine if the VBFD should explore a closely related training program in the future (research question #4). These questions were left open-ended to get the honest views of the participant. Although survey question four required a yes or no answer, it also asked participants to list reasons for their choice.

As this was a self-administered survey, each participant was given a completion date of January 15, 2003. Any surveys returned after this date was excluded from the total and the data adjusted accordingly.

### **Population**

The survey audience was randomly selected to represent members in the District Chief, Battalion Chief, Captain, and Master Firefighter ranks. At the time of the survey there were 271 eligible for participation. Selecting 32 provided a sample group equal to 11.81% of the eligible population. Of the 32 surveys distributed, 24 or 75% were returned.

### **Limitations**

This is a preliminary investigation. The limitations of the procedures were identified and evaluated. Some of the participants in the survey could be perceived as having a lack of knowledge in some of the identified areas. There may have been a false concern about participant confidentiality. However, participants should not fear any reprisal, as this survey was confidential and not controversial.

The six-month completion date did not allow the author to fully develop the criteria and form a process review team or test the self-developed survey to ensure the results were aligned with the department's strategic business plan. This additional time may have allowed for higher quality data.

### **Definition of Terms**

NETC—National Emergency Training Center.

LRC—Learning Resource Center.

Master Firefighter—A six year firefighter having successfully passed the Captains exam.

VBFD—Virginia Beach Fire Department.

ALS—Advanced Life Support.

IFSTA—International Fire Service Training Association.

## RESULTS

### Answers to Survey Questions

Question 1. List the learning skills you use most in training.

Survey question one was answered by 24 of the 32 contacted or 75%. *Doing*, *seeing*, and *listening* were the most common responses (17, 15, and 14 occurrences respectively). All responses are listed in Appendix C.

Question 2. List the learning skills you use which gain you the most knowledge.

Survey question two was answered by 24 of the 32 contacted or 75%. *Doing* was the most common response, listed by 18 participants. Nine respondents listed *repetition*. All responses are listed in Appendix D.

Question 3. What cognitive skills does the fire service recommend for quality training?

Survey question three was answered by 24 of the 32 contacted or 75%. *Doing* was the most popular answer, listed 19 participants. Other common responses included *repetition*, *listening*, *seeing*, and *evaluation*. All responses are listed in Appendix E.

Question 4. Should the Virginia Beach Fire Department train our suppression supervisors in cognitive science considerations for firefighter training? (yes or no, please give reasons to support your answer)

Survey question four was answered yes by 24 of the 32 contacted or 75%. There were 21 *yes* responses stating the Virginia Beach Fire Department should train our supervisors in cognitive science, and three *no* responses. Those who responded *yes* believed that such training would enhance the quality of the Virginia Beach Fire Department. According to one participant “even with current certifications, there is a



general deficiency of the knowledge of what allows an individual to learn. A better understanding of why and how someone learns should improve the ability of the officer to train.” Those who responded *no* believed that such training is not the responsibility of our suppression supervisors who currently have enough responsibility without any additional load.

Question 5. List any fire service organization that shows how cognitive skills are best considered in firefighter training.

Survey question five was answered by 22 of the 32 contacted or 68.75%. *Virginia Beach Fire Training Division* was the most popular answer, listed 11 participants. Other common responses included *International Fire Service Training Association (IFSTA)*, *Virginia Department of Fire Programs*, and *Virginia Department of Emergency Services* (5, 14 and 4 occurrences respectively). All responses are listed in Appendix F.

Question 6. List any non-fire service organizations that provide information on how cognitive skills are best considered in setting up training.

Survey question six was answered by 18 of the 32 contacted or 56.25%. The responses are listed in Appendix G.

Question 7. If you were developing information to use when setting up training what cognitive skills would you include?

Survey question five was answered by 23 of the 32 contacted or 71.88%. *Doing* was the most popular answer, listed by 12 participants. Other common responses included *evaluating*, *seeing*, *reviewing*, and *understanding*. All responses are listed in Appendix H.

## DISCUSSION

The results indicate there is a need to provide cognitive skills training. Firefighters are accustomed to being properly trained to do a task. With the liability potential the VBFD cannot afford to send personnel into the field without proper training. Would the VBFD gain from training fire suppression supervisors in cognitive science considerations for firefighter training? One participant stated the need for such training, “with the amount of specialization within the fire service (Hazmat, Tech Rescue, Marine, ALS, Ladder Companies) the philosophy fits.” The awareness that would result from cognitive skills training would help fire service members to make better decisions. If all fire department employees are given the same cognitive skills training, then they may be able to follow the thought processes of decisions made by other specialized components of the VBFD. Therefore, interaction between these components should proceed more smoothly, leading to increased performance.

Feedback from participants with respect to the first 2 survey questions agreed with Sandleben (2002); both emphasized personal experiences, more structured training environments, and reflection on training activities.

Many of the participants seemed to agree with Mezirow’s (1991) notion of *reflective learning*. They listed *reviewing* both as a learning technique they used frequently in training exercises and as a cognitive skill they expect their subordinates to possess. As firefighters review their training procedures, they are engaging in reflective learning. They are replacing previously held assumptions with new and more accurate information about a given situation.

Following the logic of Knowles, Holton, and Swanson (1998), superiors have the responsibility to give their subordinates proper cognitive skills training. Supervisors should promote self-direction and personal responsibility within their charges. According to the responses to the fourth survey question, the majority of participants believe fire suppression officers should receive cognitive skills training so they can properly instruct their subordinates. Such training is essential given the cognitive skills these participants expected their subordinates to have.

Participants were also asked to list both fire service and non-fire service organizations that epitomize the kinds of cognitive skills necessary for firefighter training. They tended to name organizations with which they had personal experience. Since “participants learn best when new information or skills build on past knowledge and experience” (Caffarella, 2002, p. 6), such organizations had some effect on each participant’s cognitive skill level. Therefore, survey questions five and six were important in understanding why participants tended to value certain types of cognitive skills. This kind of background information will be useful when comparing these firefighters to future participants in similar research.

One question to be answered by future research is how recruits answers to the first two survey questions would differ from those of senior fire suppression officers. This issue is pertinent since participants tended to respond similarly on the first three survey questions. That is, they believed the cognitive skills they use in their own training exercises are important for their subordinates to use in successful training exercises. It would be interesting to note whether these cognitive skills would be listed by recruits as the learning skills they both use most frequently and find most beneficial during their

initial training exercises. Differences in answers by recruits on survey questions one and two versus current participants on question three could indicate either that the recruit training regimen should include further cognitive skill instruction or that supervisors need more cognitive skills training so they can optimize the learning curve of their subordinates.

If any organization is to be successful it must find a way to pass on the knowledge and experiences of our senior personnel to the leaders of the future. Teaching our suppression supervisors in cognitive science considerations to be used in firefighter training will help to initiate this knowledge sharing process. If the VBFD fails to adopt this training, it will be no better off tomorrow than it is today.

## **RECOMMENDATIONS**

Based upon the research in this project, the following recommendations are made:

1. The VBFD should establish a process review team to evaluate training programs currently used by other fire service organizations.
2. The VBFD should adopt a formal training program for its Captains. Over 85% of the survey participants saw the need to train our suppression supervisors in cognitive science considerations for firefighter training.
3. The VBFD process review team should use the data and the survey results contained in Appendices C, D, E, F, G, and H as a starting point in developing this training.
4. The VBFD should further study and consider this training for the other officer ranks within the organization. The current leaders of the VBFD must start soon to pass on learned information to assist in developing the leaders of the future.

5. Future research on cognitive skills in training should be conducted with recruits in addition to the senior fire suppression officers already surveyed.

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# APPENDIX A

## Applied Research Project Survey

Executive Development

1

Executive Fire Officer Program  
Applied Research Project Survey

1. List the learning skills you use most in training.

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2. List the learning skills you use which gain you the most knowledge.

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3. As a fire suppression supervisor list the learning skills subordinates use to have successful training.

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Executive Development

2

4. Should the Virginia Beach Fire Department train our suppression supervisors in cognitive considerations for firefighter training? (yes or no, please give reasons to support your answer)

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5. List any fire service organization that shows how cognitive skills are best considered in firefighter training.

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6. List any non-fire service organizations that provide information on how cognitive skills are best considered in setting up training.

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7. If you were developing information to use when setting up training what cognitive skills would you include?

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## APPENDIX B



# City of Virginia Beach Fire Department

Office of Battalion 4-A  
1601 Lynnhaven Parkway  
Virginia Beach, VA, 23456  
(757) 471-5824  
[rtillman@vbgov.com](mailto:rtillman@vbgov.com)

December 14, 2002

Dear Participant

As part of the National Fire Academy's Executive Fire Officer Program, I have to complete and submit an Applied Research Project on the topic of my choosing. I have chosen as my research topic: Cognitive Science Considerations For Firefighter Training. Cognitive Science is defined in *Webster's II New College Dictionary* as the study of nature of various tasks and the processes that *enable* them to be preformed. My data collection begins with a survey that will supply answers to each of my research questions.

Congratulations! You have been randomly selected to assist me with this research project. I realize each of you is very busy, so I have limited the number of questions to seven (7). Please answer each and return to me by January 15, 2003.

Let me thank you in advance for assisting me with this project. Please remember to send it to me through the inside mail by January 15, 2003.

Thank you for your help,

Randy C. Tillman

## APPENDIX C

### Survey Question 1

List the learning skills you use most in training.

(24 of 32 contacted responded. Frequency of responses listed to the right.)

Doing	17
Seeing	15
Listening	14
Repetition	10
Comprehension	5
Review	5
Evaluation	4
Experience	3
Deductive reasoning	2
Memorization	2
Acronyms	1
Didactic	1
Feedback	1
Procedural	1
Reading	1
Writing	1

## APPENDIX D

### Survey Question 2

List the learning skills you use which gain you the most knowledge.  
(24 of 32 contacted responded. Frequency of responses listed to the right.)

Doing	18
Repetition	9
Listening	7
Evaluation	4
Experience	3
Observation	2
Understanding	2
Acronyms	1
Didactic	1
Manipulative	1
Procedural	1
Tactile	1
Divergent analysis	1

## APPENDIX E

### Survey Question 3

As a fire suppression supervisor, list the learning skills subordinates use to have successful training.

(24 of 32 contacted responded. Frequency of responses listed to the right.)

Doing	19
Repetition	9
Listening	8
Evaluation	6
Seeing	6
Reading comprehension	3
Reviewing	3
Team	2
Acronyms	1
Adaptation	1
Communication	1
Didactic	1
Imitation	1
Memorization	1
Procedural	1

## APPENDIX F

### Survey Question 5

List any fire service organization that shows how cognitive skills are best considered in firefighter training.

(22 of 32 contacted responded. Frequency of responses listed to the right.)

Virginia Beach Fire Training Division	11
International Society of Fire Service Instructors (ISFSI)	5
Virginia Department of Emergency Services	4
Virginia Department of Fire Programs	4
National Fire Academy	2
Texas A&M University	2
Connecticut Fire Training Academy	1
Delaware State Fire School	1
Gaston College Regional Emergency Service Training Center	1
International Fire Service Training Association (IFSTA)	1
Maryland Fire and Rescue Institute (MFRI)	1
Massachusetts Fire Training Academy	1
Nassau County Fire Service Academy	1
Illinois Fire Service Institute	1
Virginia Beach Fire Inspections Division	1

## APPENDIX G

### Survey Question 6

List any non-fire service organizations that provide information on how cognitive skills are best considered in setting up training.

(18 of 32 contacted responded. Frequency of responses listed to the right.)

Virginia Beach Police Department	6
US Navy	5
Institutions of Higher Learning	4
US Coast Guard	4
Stihl Manufacturing	2
US Government	2
Beach Ford	1
Franklin Covey	1
Gaming Industry	1
Greater Atlantic Search and Rescue Inc.	1
International City/County Managers Association	1
Tidewater Community College	1

## APPENDIX H

### Survey Question 7

If you were developing information to use when setting up training what cognitive skills would you include?

(23 of 32 contacted responded. Frequency of responses listed to the right.)

Doing	12
Evaluation	8
Seeing	8
Repetition	5
Review	5
Understanding	5
Listening	4
Analysis	2
Theory	2
Abstract conceptualization	1
Acronyms	1
Didactic	1
Manipulative	1
Memorization	1
Perception analysis	1
Procedural	1
Synthesis	1