IN PURSUIT OF PROFESSIONALISM:

AN EXPLORATION OF FIRE OFFICER COMPETENCY ASSESSMENT

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Abstract: Referring to an occupational field as a *profession* requires meeting formally accepted criteria outlined in historical literature. The United States fire service has yet to earn this right of being a profession. This deficiency and lack of autonomy in the field leads to vulnerabilities that threaten the existence of the United States fire service. Urgent steps are needed to address and correct this deficiency. Having specialized knowledge and skill is a criterion of a profession and is the focus of this dissertation. Exploring this criterion led to one central research question and five subquestions: 1) What fire officer competencies are relevant to the United States fire service?; 2) What benefit is there for conducting fire officer competency assessment in academic programs or the United States fire service?; 3) Where are fire officer competencies best learned?; 4) What consistency in curriculum exists across regionally accredited fire-related baccalaureate degree programs in the United States?; 5) What framework of professional development exists in the fire service?; and 6) Does the United States fire service meet the criteria of a profession?

Three qualitative phases of research were used to develop a tool to assess fire officer performance, which were subsequently analyzed with the Cornell technique of the Guttman Scale Analysis process. The results indicate fire officer competencies are scalable for each competency and across competencies. Using the Guttman Scale Analysis model also provides a clear indication of how the rating terms of mastery, developing, novice, and deficient can be defined. These results permit the determination of how well a fire officer does the job in terms of individual competencies and how much of the overall job is performed well.

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CHAPTER I

INTRODUCTION

Historical literature, national reports, and renowned fire service experts state the fire service is not a *profession* – it is an occupation (Clark, 1993; Federal Emergency Management Agency, 1987; Granito, 2009; Iliescu, 2008; International Association of Fire Chiefs Foundation, 2006; The Johnson Foundation, 1966, 1976, 1986; Onieal, 2005, 2007; Vollmer & Mills, 1966; Volunteer Firemen's Insurance Services, Inc., 1996). An occupation becomes a profession by fulfilling established criteria that is founded in "autonomy, authority, and licensing" (Rothman, 1984, p. 184). By having authority, the professional is deemed the expert of the field and holding specific knowledge that does not exist in general society (Parsons, 1937). This authority does not extend to other parts of the societal structure; thus, is historically referred to as expert power in which the professional is deemed to have "some special knowledge or expertness" (French & Raven, 1959, p. 156). While the term profession is commonly associated with and used in the fire service, there is no authentication for the use of the term. "Presently most fire service knowledge is based on experience and consensus, neither of which is acceptable to academic and professional communities" (Clark, 2004, p. 56).

In society, since about 1960, public opinion questioning the credibility of professions is critical and not accepted without scrutiny (Houle, 1980, p. 5-6). Houle (1980, p. 5) further states that public criticism has come from "incompetent practice, ignorance, or a misguided or uninformed sense of ethics." News stories covering incompetence or unethical behavior are easy to find, and the fire service is no exception. The expectation is that practitioner (an individual who has been authorized to practice in a defined profession) competency is demonstrated not only with an initial assessment, but at regular intervals. Demonstration of specialized knowledge and skill competency is a core criterion to a profession. This study was designed to explore competencies in the fire service and how they can be assessed. The specificity of assessment is at the administrative fire officer level (i.e., Fire Officer III) and in fire-related academic degrees at the baccalaureate level. The objective was to learn about this small piece to the larger profession discussion.

Over the years, the definition of a profession has been stated in various ways. The first proposition of criteria of a profession was stated by Flexner (1915, p. 905), which are "professions involve essentially intellectual operations with large individual responsibility; they derive their raw material from science and learning; this material they work up to a practical and definite end; they possess an educationally communicable technique; they tend to self-organization; they are becoming increasingly altruistic in motivation." Added to these criteria of a profession is the "technical impartiality of the administration of an office" where decisions are made with limited influence of the interpersonal relationship (Parsons, 1937, p. 462). The situation is the focus on *what* the problem is and not on *who* the person is (Parsons, 1937, p. 462).

Complementary to these criteria are having members of an occupational field or vocation holding highly specialized knowledge and skill, serving the community with autonomy by a code of ethics, and having standards of practice where competence is demonstrated to a regulating authority (Barber, 1963; Gardner & Shulman, 2005; Hughes, 1963; Kern, 2011). Additionally, Greenwood (1957, p. 45) used the term attribute instead of criteria to describe what "…all professions seem to possess: (1) systematic theory, (2) authority, (3) community sanction, (4) ethical codes, and (5) a culture."

Shaw's (1876, p. xiii) proclamation of the fire service being a profession was based on "if [it was] properly studied and understood." This "if" assertion continues to be problematic in the fire service, and the literature shows it has not been rectified. Furthermore, in 1928, Carr-Saunders challenged the claim of the fire service as a profession (Vollmer & Mills, 1966, p. 4). Internal challenges to the professionalization of the fire service followed and have persisted. National reports, such as *Wingspread*, have highlighted the non-professional status of the fire service and that changes continue to be needed to correct this deficiency (The Johnson Foundation, 1966, 1976, 1986; Volunteer Firemen's Insurance Services, Inc., 1996; International Association of Fire Chiefs Foundation, 2006). Corroborating these reports, the *America Burning Revisited* (Federal Emergency Management Agency, 1987, p. 65) stated there was a "lack of professionalism at all levels in the fire service." The credibility of the fire service, claiming an unjustified status as a profession, is in jeopardy from the community, the politicians, and other professions.

One of the problems for the fire service in becoming a profession is that an independent professional association with regulatory authority to admit, renew, or revoke the right of

practice of a fire service member does not exist. "Where public protection was a historical, primary intent, today, professions without recognized credible credentials are at risk of being seen as less than professional and are at further risk of allowing external forces to regulate their profession for them" (Buckendahl, 2017, p. 5). Creating a professional association to address this external risk in the fire service is possible. The professional association will need to develop a competency assessment process at each rank in the fire service. This process will need the involvement of many stakeholders to ensure competencies capture the general scope of performance. Specialized operational knowledge and skill in the fire service could be handled in a similar fashion to specialty medical doctors. While the regulatory authority of a professional association is yet to be tackled; resources already exist from prominent organizations in the fire service to achieve this. Additionally, assessing individuals in a training class is not new to the fire service. The process to assess skills is established. This type of assessment does not meet the level of inquiry of this study.

One prominent resource in the fire service is the National Fire Protection Association (NFPA). NFPA (2018a) produces consensus standards that may be voluntarily adopted or followed by fire departments. This study used the 2014 edition of the NFPA 1021 *Standard for Fire Officer Professional Qualifications* as one of three source documents for defining fire officer competencies. NFPA 1021 outlines the requisite knowledge and skills of fire officers on four levels – Fire Officer I through IV. These levels coincide with the four levels of fire officer stated in the International Association of Fire Chiefs (IAFC) Officer Development Handbook (International Association of Fire Chiefs, 2010)

and the Center for Public Safety Excellence (CPSE) Professional Credentialing process (Center for Public Safety Excellence, 2013) as displayed in the figure below.

Figure 1. Comparison of Fire Officer Levels and Terms.

NFPA 1021	IAFC ODH	CPSE Designation
Fire Officer I	Supervising Fire Officer	Fire Officer
Fire Officer II	Managing Fire Officer	Fire Officer
Fire Officer III	Administrative Fire Officer	Chief Fire Officer
Fire Officer IV	Executive Fire Officer	Chief Fire Officer

Figure 1. A comparison of the three prominent documents guiding fire officer development. The NFPA, IAFC, and CPSE encourage the use of their documents by fire departments and fire officers.

The problem of not having a professional association to regulate fire service membership is that employment decisions and competency standards of each member vary across the United States. There is not a consistent way to assert fire personnel are competent to a standard. The term firefighter can be applied to any person who performs in the capacity regardless of competency. Furthermore, the general application of – once a firefighter always a firefighter is a tradition that is jeopardizing the occupation as we know it. A certification or licensure process is a way to verify the competency of fire service

members. The fire service would need to collectively develop the competencies of each rank. The certification and licensure process does not need to be created from scratch. Utilizing the existing processes from the medical field and documents from the NFPA, IAFC, or CPSE could begin the process of professionalizing the fire service.

The competencies of each rank in the fire service would need to extend to the training and education environments. The training and education of fire service members are currently set as recommendations by the NFPA, IAFC, and CPSE. Recommendations are inadequate in moving the fire service towards professional status. Mandates are needed. Change in tradition is difficult and "no occupation becomes a profession without a struggle" (Goode, 1960, p. 902). The struggle for change is significant for the fire service. The NFPA reports, "there were 1,160,450 career and volunteer firefighters in the U.S. in 2015" (Haynes & Stein, 2017, p. iv). Instituting regulatory change affecting over one million firefighters will be nearly impossible if approached from a top-down mandate. "Any talk of the new 'science' on which the profession rests its claims may be met with derision by the old-timers, who believe that at best they command an art, perhaps merely a skill to be acquired through apprenticeship" (Goode, 1960, p. 904). Professionalizing the fire service is not a new concept and steps have been taken to overcome challenges such as defining standards. The fire service will need to bring together the work already done in a unified manner to address the difficult regulatory hurdle.

Another problem for the fire service is the post-secondary education system supporting the fire service has been called "uncoordinated and fragmented" (Onieal, 2005, Part Three, para. 4). Onieal (2005, Part Two, para. 14) further states, "few understand what a

'Fire' degree means. This makes it difficult for other schools and employers to assess the education or skill of prospective students or employees." This lack of consistency or direction in requiring occupational fire training or education continues to exist today in the United States. Curriculum determined by each academic program can prepare students for certification testing or licensure examination by a professional association. Local advisory boards, employers, business leaders, and other identified stakeholders provide input and guidance that is in the best interest of its students and follows the best practice of the educational system (Association of American Colleges & Universities & Council for Higher Education Accreditation, 2008). Standardizing curriculum may seem like a prudent approach to coordinating the education of fire service member; however, research shows standardized curriculum is not the answer and can have a negative effect on learning (Eisner, 2002; Brooks, 1991; National Highway Safety Traffic Administration, 2000).

The discussion on curriculum in fire-related academic programs should be on the assessment outcomes – not the curriculum. The fire service needs a national goal for education that guides the assessment of student learning in academic programs to support the professionalization of the fire service. Accountability and credibility are achieved by having clear goals, objectives, and assessment of student learning (Eisner, 2002, p. 7). The fire service, affiliated organizations that support it, and academia need to embark on a journey together to understand the forces that influence the process and get "a clear sense of direction" (Tobias, 2003, p. 451) to support the certification and licensure assessment process. With no stated or agreed upon national aim, goal, purpose,

objective, or outcome of fire-related education, defining outcome assessment of competencies will remain fragmented.

The 2015 National Fire Service Research Agenda illustrates the problem with the fire service education system. The document has fourteen total topics and fifty-four prioritized recommendations for 2015 (National Fallen Firefighters Foundation, 2016). Forty of these recommendations related to the process of conducting research, developing methods, determining a process, or assessing a process. There is no inclusion of any recommendation on *who* or *how* this will be accomplished. Highlighting the debate on the fire service as a profession brings this deficiency into perspective on the work that still needs to be done for professional development. As stated in the Executive Summary, "although the publication of a new Fire Service Research Agenda causes great excitement in the academic and research community, the broader fire service often has very little interface with it, and may subsequently lack understanding of its true impact" (National Fallen Firefighters Foundation, 2016, p. ii). While the development of the research agenda involved some fire service personnel, the results of any study and the impact to the fire service is said to be mostly from external sources (National Fallen Firefighters Foundation, 2016). As Shaw (1876, p. vii) stated, theory and practical application must be achieved in unison – one without the other is at minimum counterproductive but can be categorized as dangerous, especially in the fire service.

The positive impact and significance of the research agenda topics and recommendations are not questioned in this study; however, it is strikingly discernable that no reference to the assessment of competency, training, education, accreditation, or credentialing of fire service members is addressed. The importance of this agenda should prompt a research

community *in the fire service*. Relying on external entities to conduct research *for the fire service* places it in a vulnerable and reactionary position from external influences. It is not proclaimed in this study that no research exists in the fire service; however, it is evident that a fire service research community could have a positive impact to support a structure for centralizing research at all levels of the fire service. Expanding the capacity of fire service personnel to be involved with and understand fire service research could lead to greater firefighter safety and survival, which is a goal of Firefighter Life Safety Initiative #7 *Research Agenda* (National Fallen Firefighters Foundation, 2015a). Recent examples of fire service personnel involved in research can be found with cancer prevention.

Vulnerability of the United States Fire Service

Public safety service is vulnerable to the internal and external environments where public policy decisions are changing the landscape in which they operate (Bowman, West, Berman, & Van Wart, 2004, p. 5). Alarm bells have been sounding for years about the sustainability of the traditional fire service. No doubt advancements have been made with regards to how firefighters accomplish their mission (see for example, the National Fire Protection Association codes and standards, the National Fallen Firefighters Foundation Research Agenda and Life Safety Initiatives, and the International Association of Fire Fighters (IAFF)/IAFC Joint Labor Management Wellness-Fitness Initiative); but, the resistance to change from within the fire service is also evident (International Association of Fire Chiefs, 2015; Rothmeier, 2017; Siarnicki & Gist, 2010) and jeopardizes sustainability. The traditional fire service has been the recipient of support from the public and jurisdictions since its inception; but, this support is waning

under greater scrutiny of those who ultimately decide the future of any service provision. Fire departments are no longer immune from scrutiny in regards to costs and the service delivery model in use. Communities are examining alternative strategies to how service delivery is achieved. This time to act is now if the United States fire service wants a voice in its future (Onieal, 2014). Developing strategies to protect itself and its image must be viewed from a global perspective with many stakeholder groups.

The threat of outsourcing public safety operations, including fire services, to regionalization/consolidation, privatization, and devolution has been occurring for years. As Keisling (2015, p. 1) stated, the traditional fire department "no longer exist anywhere in America." The message behind this statement is the changing environment in which fire departments now operate. As financial woes continue to plague all levels of government, "the move to cut back and outsource services is seen as an opportunity by some and a threat by others" (Bowman, West, Berman, & Van Wart, 2004, p. 10). To become a change agency in society, the fire service will need to expand it viewpoints beyond organizational strategic planning and community needs assessments. A 30,000-foot view of the emergency service delivery in a community is no longer broad enough. If the fire service in the United States is to be sustained at any level, it must be able to function in the environment where "increased sector mobility, privatization, and devolution" are occurring (Bowman, West, Berman, & Van Wart, 2004, p. 5). In a similar statement, Kodras (1997, p. 80) lists "three primary strategies to change at the state government level, (1) devolution, (2) privatization, and (3) dismantling." As the burden of providing services and programs is redirected to the states, so is the possibility

of outsourcing services and programs to cities and towns. This redirecting of responsibility is already occurring at the state and local levels of government.

Threats like these, along with today's global society, and resistance to innovation and change all put the fire service in peril of losing support from citizens and elected officials. The storied tradition of the fire service will only go so far – "culture is the root of our problem" (Rothmeier, 2017, para. 2). As stated previously, action is needed. Researchers are studying the traditional fire service and challenging its continued and avoidable high-cost service method for the 'just-in-case' true emergency incident where time is of the essence (Keisling, 2015, p. 2). The "devolution revolution" is well documented in regards to federal programs and the impact on state and local governments has been extended to local governments as well (Eisinger, 1998; Kincaid, 1999; Kousser, 2014; Krane, Ebdon, & Bartle, 2004; Tannenwald, 1998).

Stories in the news of regionalization, consolidation, privatization, and devolution are easy to find. Here are some stories published within a fire service media outlet that punctuate the issue:

- Abolition of Fire Department; Employment of Paid Firemen (New York State Statute, n.d.)
- Abolish the police. Abolish the fire department. Abolish Brooksville? (Behrendt, 2017)
- As wildfires rages, insurers sent in private firefighter to protect home of the wealthy (Scism, 2017)
- Brunswick abolishes fire supplements, some smaller departments' future in jeopardy (Spenser, 2018)

- Cadillac fire protection: Private ‘specialists’ give extra protection to those who can afford it (Fernandez, 2017)
- Calumet Park outsources fire department in ‘historic’ move that could trigger ‘chain reaction’ of privatizations: Official (Koeske, 2018)
- Cash-strapped Mascotte should abolish its fire department (Ritchie, 2013)
- Court: Fire commission has authority to dissolve (Bashaw, 2018)
- Dorchester Co. considering shutting down Ashley River Fire Department (Miller, 2019)
- Exploring police, fire and EMS services in the city of Manistee (Bradford, Smith, Bachman, & Deisch, 2010)
- Fire district votes to dissolve, sparks outcry (Richardson, 2018)
- Julian’s volunteer fire department approved for dissolution (Jones, 2018)
- Police consolidation, regionalization, and shared services: Options, considerations, and lessons from research and practice (Wilson & Grammich, 2012)
- Prevalence, form, and function of consolidated public safety department in the United States (Wilson & Grammich, 2017)
- Some Californians are hiring private fire crews to save their homes. Regular firefighters aren’t happy about it (Fry & Flemming, 2018)
- Village board, union reach deal to eliminate Garden City’s paid fire department (Asbury, 2018)
- Wealthy’s use of private firefighters ignites debate in wildfire country (Sottile, 2018)

Regionalization and consolidation of fire departments are more common than privatization and devolution efforts. But, these latter two situations may be seen as more threatening. A forecast of the possibility of devolution is found in the *America Burning* and *America Burning Revisited* documents where trends of change were well documented. The future of the fire service and the adequacy of fire services was questioned because of the "cultural-lag" that exists and the inability to keep pace with societal changes (National Commission on Fire Prevention and Control, 1973, p. 5). Public protests in 2018 are reaching the highest levels of government. No person, public office, or government agency is immune from scrutiny. It would be prudent for all public safety organizations – not just the fire service – to critically examine service delivery on a scale not done before. An example of a local fire service under scrutiny comes from the County of Santa Clarita, California. A grand jury report pointedly outlined an unaffordable fire service that was stuck in the traditional status quo. "Logic would dictate that SCC fire departments' continued insistence on clinging to a 100-year-old response model designed to fight structure fires makes no sense given the modern reality that structure fires are the exception and medical emergencies are the norm" (County of Santa Clarita, 2011, p. 9). The report examines the potential for consolidation and regionalization of public safety services. A change was needed and the change was being driven by a citizen-lead grand jury – not the fire service.

Another developing threat to the traditional fire service is the privatization of fire services by wealthy individuals during the 2018 California wildfire season (Fernandez, 2017; Fry & Flemming, 2018; Scism, 2017; Sottile, 2018). The future of privatizing individual properties or neighborhoods by private companies is unsure; but the concept deserves

immediate attention if the fire service wants to influence future decisions. Should the public be able to hire private fire crews under the jurisdictional purview of a local or state fire department? How could this change the landscape of providing fire protection in the future? These questions are not examined in this study, but are used to emphasize the need to be able to influence high-level decisions by elected officials.

The talk of devolution has been around since World War II but became significant at the federal government level after the 1994 election with the *Contract with America* (Kodras, 1997). The intention was deregulation and to end big government by giving states and cities more control. While there is disagreement about the size of government then and now, the process of redirecting service authority to the states, or the devolution of federal programs, was most significant with social welfare and the highway speed limit (Kincaid, 1998, 1999). The process of devolution is most commonly discussed with regard to the delegation of programs from the federal to the state level. However, devolution from the state to the local level or in individual communities is occurring.

Taking a status quo approach to we have always provided service this way is outdated and risky (Federal Emergency Management Agency, 1987, p. 45). It has been stated over time, decisions concerning the status of fire services will be made externally if action is not taken to influence the process (Federal Emergency Management Agency, 1987, pp. 46-47; Onieal, 2014). Fire service personnel need to be flexible and innovative to lead change, not react to it. Professionalization of the fire service could help become both of these things.

What is the future of the fire service if these outsourcing decisions are made without input from the fire service? The fire service should be the driving force of influence about the field. Becoming a true professional field can be one immense factor in changing the influence of decisions from external to internal. The professionalization of the fire service needs to include absolute standards for education, training, competence, and professional development. The decision on what this future is may depend on how well the United States fire service takes this challenge seriously in creating research-based data to influence these decisions. Creating research-based data is not as simple as going out to the training grounds to try out a fad that getting written about in a trade magazine. It takes highly educated members working with research entities to develop empirical findings. This is not accomplished in a vocational training setting. The push for increased vocational training for occupations serves a purpose in the preliminary preparedness of individuals to perform job tasks; but, this training environment needs to be understood for what it is – and more importantly, what it is not.

Study Purpose

The purpose of this research study is to explore the assessment of fire officer competencies as one means to professionalize the fire service. More specifically described are (1) the method of assessing fire officer competencies, (2) the amount of consistency in competency use, (3) the level of importance of competencies in the fire service, and (4) what may be changed in the consideration of a list of fire officer competencies. The assessment of competencies in the workplace and in academic programs are crucial to accountability and quality improvement. In education, this assessment is commonly referred to as the assessment of student learning, which provides

valuable information into the design of curriculum and where improvements can be made. This process is straightforward and common to any given academic program in regionally accredited colleges and universities, including fire-related degree programs. In fire-related degree programs competencies and assessment of student learning are defined per program in terms of outcomes. The deficiency in this is that there is not a common direction for what a fire education degree means. This leads to a fire-related education system with uncommon goals and an inability to provide a consistent validation of fire officer competencies to stakeholders. This deficiency is directly related to and influences the ability to for firefighters to achieve professional status.

This study will broadly explore education and training as it relates to professionalizing the fire service, the assessment of student learning at the baccalaureate level in fire service related education programs. Furthermore, this study will explore the assessment of fire officer competencies in academia and fire departments from an inductive nature with a qualitative methodology. Competency of fire officers, and students at the baccalaureate level in a regionally accredited fire-related degree, will be the focus of data collection with an assessment tool analyzed. The direct relationship between professionalism and competency assessment is significant and supported in the historical literature. The link from the professionalization process is a set of criteria that includes competency assessment in an occupation, along with the training and education of workers to support this process.

It is intended for the results of this study to be an impetus to a national collaborative effort to achieve a consensus on professionalization process that includes competency assessment and educational goals. The fire service community needs to work with fire

service entities that train, educate, accredit, and credential members of the fire service. This collaborative effort must be an inclusive group, ensuring all stakeholders are represented. Buy-in of this effort must come from all stakeholder groups if change and success are to be realized. The change of the fire service from an occupation to a profession is recognized to be a formidable undertaking. Consensus will not be easy and it may even be contentious. When an end goal is agreed upon, the ensuring debate can be healthy even when there is disagreement. The threats to the fire service are real and it is time to maximize the existing positive frameworks and traditions of the United States fire service in a way that puts all firefighters on the front line of research, innovation, accountability, quality improvement, and professionalism.

Importance of the Study

The fire service is a dynamic work environment, not only with traditional fire suppression activities; but also, with emerging trends in emergency response (Onieal, 2014). The competence of responders to meet this need with critical decision-making abilities is crucial to life and safety of responders and the public. This ability needs to focus on future trends in emergency response, not the past experiences (Onieal, 2014). Research shows that critical thinking skills, tacit knowledge, technical and communication skills are developed over time (Epstein & Hundert, 2002; Trinder, 2008). Professional competencies are needed for decision-making, but are not gained from experience alone (Epstein & Hundert, 2002; Onieal, 2014). The Literature Review in Chapter II will expand on the continued learning and describe the lifelong learning process now required of professionals if they want credibility in their proclamation of professional status. It is hoped the reader of this study gains an appreciation for the work that has been done to

professionalize the fire service, but also learn of the improvements that are still needed if professional status is to be formally attained.

Developing a fire service specific body of knowledge through empirical research is one core element missing in the drive to reach the status of a profession. This is significant to the decision-making process of public service organizations. Overcoming these challenges from outside the fire service include developing a research community from within the fire service (Clark, 1993, 2004, 2005; Granito, 2009; Moschella, 2008). The deficiencies found should be viewed as encouragement to generate interest in further studying the professionalization process in the fire service with empirically based research. This study is intended to be used as a foundational study so future research can expand the theoretical knowledge and understanding of core and specialized competencies in the fire service and how these can be assessed.

Overview of the Study

This chapter outlines the status of the fire service in the United States as an occupation facing significant threats to its existence. Professionalizing the fire service is one way of overcoming external threats by creating a system of accountability and quality improvement. To professionalize the fire service, criteria must be met. The relationship between professional status and the assessment of competencies of specialized knowledge and skill is at the forefront of this study.

Chapter II reviews the literature review and further describes the framework that is in place to support this a collaborative professionalization effort. To help focus this collaborative effort, Life Safety Initiative 5: Training and Education (National Fallen

Firefighters Foundation, 2015b) should be one area of discussion that promotes action. However, as evident in the 2015 National Fire Service Research Agenda (National Fallen Firefighters Foundation, 2016) document, these critically important elements to professionalizing the fire service are elusive. Additionally, it is intended that this study be a catalyst for further fire service related studies specific to the professionalization process in the fire service. An in-depth examination of fire-related education with the development of a national fire service educational goal is discussed. The existing credentialing processes in the fire service are described, as is an exploration of fire officer competencies along with assessment procedures to define achievement. In addition to these elements, research is expanded to include the theoretical sociological foundations of the professions. The body of knowledge develops a theoretical base for practical application to the fire service.

Chapter III details the research methodology and design of this study. The initial research approach is outlined along with the modification that was needed to overcome insurmountable challenges during data collection. Chapter IV outlines phase one and two of the study where unobtrusive measures and focus group work was conducted. These phases remained consistent throughout the study process and provided a solid foundation for phase three. Chapter V is a presentation of the data collected from the questionnaire sent to fire service personnel and academic programs. The questionnaire was split into two similar paths – one for fire department members and one for academic programs. The scale analysis combined the two data sets due to low submissions from academic programs. There were no negative effects from this combination. Chapter VI presents the conclusions and recommendations of the research. While scalability was seen

between the ranking within each competency; scalability was not achieved across all competencies.

A point of clarification is needed about the discussion of the fire service as an occupation. The dedication of over a million firefighters in the United States is not questioned or examined. Important work is accomplished everyday by firefighters who meet the challenges of responding to and managing incidents of a modern technological and global society. The public expects situations to be handled efficiently and effectively by all public safety agencies. For firefighters, meeting these challenges requires research-based information, which is occurring, but needs significant enhancement. Advancements in fire suppression operations, firefighter health and safety, and community mapping are just three significant areas of recent research that are being embraced in the United States fire service. However, most research about the fire service is being conducted from external entities and that the fire service membership is generally not grasping or accepting the results of research (National Fallen Firefighters Foundation, 2016). The professionalization process can be one avenue of creating occupational sustainability through research-based information by a highly educated and skilled workforce.

Summary

The United States fire service needs to heed the warning that has been profoundly expressed by experts or risk the outsourcing of fire department services that is becoming more common. Illegitimately claiming an occupation as a profession brings questions of the lack of integrity, incompetence, and outdated work practices to the forefront. If the fire service is serious about being a profession, then its membership and supporting

organizations must develop a benchmark of competence to be achieved by fire service practitioners to be admitted to the field and demonstrate a right to remain in the field.

A positive and rigorous national discussion about the professionalization of the fire service is needed as a foundation for its sustainability. Professionalization of the fire service will be a daunting process that will require the involvement of many diverse stakeholders. The fire service does not need to reinvent the wheel for professionalizing. Examining the process of other occupations provide some fundamental guidelines that can be followed. Starting with aligning competency assessment to students and fire officers. This exploration study is intended to spur further studies on this topic to help fine tune a process.

CHAPTER II

LITERATURE REVIEW

Specialized knowledge and skill is one criterion of a profession that is obtained in the training and education environments. Experience is considered separately, as it provides the real life situations to enhance knowledge and skills learned elsewhere. Experience is gained on-the-job and helps fire service members improve performance over time. Unfortunately, the fire service has fallen into a quandary of training and education, which has been described as "uneconomical and inefficient" due to a hodgepodge approach to learning (International Association of Fire Chiefs, 2010, p. 8). This issue has also been described as a nonintegrated, "fragmented" system of "inefficiency" (Onieal, 2005, Parts 1 & 3). One possible reason for this issue is due to no nationally adopted standard for the training or education of a fire service member. Every fire department determines what job qualifications, if any, are needed at entry, for sustained employment, or for promotion. The National Fire Protection Association (NFPA) outlines the *recommended* qualifications of different fire service levels, which includes NFPA 1001 *Standard for Fire Fighter Professional Qualifications* for Fire Fighter I, II, and the five levels of emergency medical service training; and NFPA 1021 *Standard for Fire Officer Professional Qualifications* for Fire Officer I, II, III, and IV, to name a few. These

NFPA recommendations provide a solid foundation for initiating a discussion on adopting performance requirements for all fire service members. Having "46% of all fire departments that are responsible for structural firefighting have not formally trained all their personnel involved in structural firefighting" (National Fire Protection Association, 2011, p. v) highlights the issue.

A trained and educated workforce is one of many critical success factors for organizational sustainability in today's dynamic world. Organizational sustainability can be referred to in a fire department or with the fire service in general. Organizations that do not change or adapt in a timely manner with new or transformed innovations can become obsolete as the public looks elsewhere to have their problems solved (Onieal, 2014). Organizations oriented to the past will invite a diminishing mission, thus jeopardizing its existence. A related vulnerability to the diminishing mission is a deviation of mission, called mission creep, (Department of the Army, 2003). Originally used in the military, it can occur when directives put units in unfamiliar work environments or when crews do more than what they are trained for (Department of the Army, 2003). The mission of the fire service in the United States is changing and some adjustments to this change are occurring. For example, the term all-hazards response is now being used to describe what fire departments do. But, are firefighters properly trained and educated on what this is and how decisions are made? Is the term firefighter even an accurate description of the job they are tasked to perform?

An issue raised in this study is the assessment of competency as seen with a certification or licensure process. This literature review examines the assessment of competencies of fire officers and how this can be one element of the professionalization of the fire service.

Assessment of fire officers and students in a fire-related academic program should be on complex situations. This type of assessment is called authentic because it replicates situations seen in the real world. Fire service members and students need authentic assessment to help improve their performance and competency level.

An Orientation of Assessment

Assessment is the primary element in the data collection and analysis of this study. The benefit of assessment is that it promotes quality improvement feedback and an open discussion of how this can happen. This open discussion invites the individual being assessed to be an active participant in their learning (Boud & Falchikov, 2006). Being an active participant in the process, the individual develops skills of critical self-assessment that extends well beyond the learning environment. Assessment can also be one element of a coaching and mentoring process in the fire service and in education. The historical foundation of the assessment of student learning began with the use of formative and summative evaluations in the educational setting (Bloom, Hastings, & Madaus, 1971; Scriven, 1967). Often times, formative evaluations have been referred to as "low-stakes decisions" during the instructional process (Anderson, Krathwohl, Airasian, Cruikshank, Mayer, Pintrich, Raths, & Wittrock, 2001, pp. 101-102 and 246-247). This provides the ability for students and instructors to make adjustments during the learning process and improve the overall learning outcome. Formative evaluations also provide students with valuable feedback at more frequent intervals than summative evaluations (Bloom, Hastings, & Madaus, 1971, p. 133). This feedback interval is critical for ensuring proper technical skill acquisition is learned and practiced during training in accordance with current standards or adopted guidelines.

Summative evaluation occurs after a topic is covered in order to determine the level of learning mastery (Bloom, Hastings, & Madaus, 1971, p. 133). These formal assessments are defined as "high-stakes decisions" in the instructional process (Anderson et al., 2001, p. 246-247). The disadvantage to summative evaluations is that current students miss the opportunity to improve on the level of mastery they have achieved (Shulman, 2007, p. 24; Suskie, 2009, p. 23) – or is it? Summative evaluations do provide faculty the opportunity to make improvements for subsequent student learning and instructional methods (Suskie, 2009, p. 23), but as this study will illustrate, feedback to a performance can be done with lifelong learning improvement achieved.

Formative and summative evaluations are used in both the training and educational settings for similar reasons – improved learning. It is important to correlate the improvement of learning to both student achievement and an improvement in instructional methods. For the purpose of this study, it is recognized that the historical use of the term *evaluation* is now called *assessment*. The modern use of evaluation is associated with reviewing program level performance; while assessment is associated with grading individual performance. From this point forward the term assessment is used to represent the grading of individual performance because the focus in this study is with individual performance of both students currently enrolled in a bachelor's degree and fire officers with a bachelor's degree.

The concept of individual performance assessment is based on competencies as explained in Chapter III. Competency assessment can be simple or complex. Simple assessments are single skill performances, grading of multiple choice exams, or participation in discussions of a topic. Complex assessments are referred to as authentic, in that a

performance is comprehensive and includes several assessment points. "Therefore, a level of assessment literacy that aligns with the needs of the credentialing program should be sought with concerted efforts to assist with development of some core concepts (e.g., validity, reliability, fairness) and how these will be strengthened, observed, and documented in the program" (Buckendahl, 2017, p. 17).

Assessment of student learning has been steadily growing since the 1990s when it became a core element of the regional accreditation process (see for example, Council for Higher Education Accreditation, 2006; Higher Learning Commission, 2017; Middle States Commission on Higher Education, 2015; Schneider & Shulman, 2007; Southern Association of Colleges and Schools, 2011). When discussing assessment of student learning, a discussion about outcomes is necessary. According to Council for Higher Education Accreditation (CHEA) (2006), outcomes are determined after education where students demonstrate what they have learned. It is also necessary to define *student outcomes* and *student learning outcomes*, as they are not the same and should not be used interchangeably. This study will follow the distinction made by Hernon (2013, p. 6) and Ewell (2001, p. 14) in that *student outcomes* are institutional level statistics of accountability such as placement, graduation, student retention, and time-to-degree rates; accessibility of a program to a student; and the amassing of student debt. CHEA (2003, 2006) uses student achievement interchangeably with student outcomes which is considered to be acceptable. Student outcomes are indirect measures of assessment that inform us about the environment in which learning occurs (Schwartz 2013, p. 181). However, others may refer to student outcomes as direct measures of cognitive and affective aspects of learning (Astin & Antonio, 2012, p. 46). To try to help clarify the

terms, Ewell (2001, p. 7, 10) states "*student learning outcomes* should refer normally to competencies or attainment levels reached by students on completion of an academic program;" and that the competencies are essential knowledge, skill, and ability dimensions expected in the discipline (Council for Higher Education Accreditation, 2003, 2006).

Student learning outcomes are of primary consideration in this study and will be the focus of further discussion here and in the following sections of this chapter. As stated previously, standardization is no longer an accepted practice in curriculum development or assessment of student learning outcomes. CHEA (2003, p. 4) states, "student learning outcomes need to be addressed within the context of this nation's decentralized, mission-based system of higher education." It is recognized that definitions on the level of student performance, or what Tanner (2001, p. 50) calls "the *degree* of accomplishment," is an institutional or program level decision is a principle measure of effectiveness in higher education (Council for Higher Education Accreditation, 2003). In addition to the CHEA guidelines, reporting program outcomes and the assessment of student learning are requirements of program accreditation from the International Fire Service Accreditation Congress (IFSAC) (2018a). The guidelines for program accreditation ask for documentation on the process – there is no mandated one-sized fits all definition of student learning outcomes. Typically, each academic program works with their local advisory board to define or revise program outcomes. For academic programs, assessments of student learning typically occur in capstone courses, licensure examinations, authentic performances, portfolio reviews, or select work from students (Council for Higher Education Accreditation, 2006).

Assessment theory (Brookhart, 2004) and sustainable assessment theory (Beck, Skinner, & Schwabrow, 2013) are now coming into their own as theoretical perspectives. These perspectives are starting a new paradigm of thought about the decentralized education system in order to meet local and national interests (Berlak, 1992, p. 8). Utilizing what is becoming the accepted principles of assessment theory opens new doors for fire service academic programs. The push here is a national consortium of stakeholders working on elements of professionalization with the fire service. Professionalization of an occupation is inextricably linked through higher education and more importantly, the competency of the workforce to function within the operational and societal settings.

The importance of assessment in training and education cannot be overstated. Regional and program accrediting entities require it and the public expects it (Council for Higher Education Accreditation, 2001, 2003, 2006; Association of American Colleges &Universities & Council for Higher Education Accreditation, 2008; International Fire Service Accreditation Congress, 2018a; Pellegrino, 2004, p. 5). It is a mainstay in today's higher education system and with certifying entities. The origins of assessment of student learning are dated to the early 1900s when the Carnegie Foundation was established, and in following years, the Carnegie Unit was defined (Shavelson, 2007, p. 5). The Carnegie Unit is also called the credit hour (Silva, White, & Toch, 2015, p. 3). The historic foundation of assessment is defined by Shavelson (2007, p. 5) with four distinct eras of progression:

- The origin of standardized tests: 1900-33;
- The assessment of learning for general and graduate education: 1933-47;
- The rise of test providers: 1948-78;

- The era of external accountability: 1979-present

During the third and fourth eras of assessment (1957-1999), four specific influences on assessment were identified as "psychometrics, theories of cognition, the nature of curriculum, and the sociopolitical context of education" (Pellegrino, 2007, p. 7). These influences overlap with modern assessment practices with fundamental roots in "program evaluation and scientific management" from the 1960s and 1970s (Ewell, 2002, p. 3). Assessment in higher education grew to examine student outcomes as a measure of how well the system functioned (Ewell, 2002). Researching these elements was originally oriented in quantitative methodology but qualitative research approaches continue to gain in popularity (Ewell, 2002).

By 1985, assessment made the national conference stage (Ewell, 2002), so begins the discussion, or debate, on the purpose and definition of assessment. The purpose of assessment may generally fall into formative or summative assessment approach. Formative assessment orients toward improvement and learning; while summative assessment focuses on accountability and certification (Boud, 2000, p. 155; Boud & Falchikov, 2006; Ewell, 2002, p. 9). It is the accountability factor that directly relates to the research design of this study.

In a general sense, assessment practices are an integral part of educational institutions as a system (Council for Higher Education Accreditation, 2003; Ewell, 2002) and of the process of instruction and learning (Tanner, 2001, p. 7). For example, a system in higher education can be assessed using a framework model, such as the "input-environment-outcome (I-E-O) model" (Astin & Antonio, 2012, p. 17). The I-E-O model is a broad

collection of information from different areas of a student's background and experience in college (Astin & Antonio, 2012). This study will focus on the outcome element of assessment.

In fire-related education, the degree of accomplishment of graduates could be determined in order to improve reporting of student learning outcomes to accreditors and the public and answer the question asked earlier – what is a fire degree? An assessment procedure or framework is needed to make this possible, but one that is flexible and adaptable to individual programs. It is the purpose of this study to propose one such adaptable framework. As previously stated, the fire service education system is in need of direction on a national goal and compass heading to which colleges can orient. As evident in the literature and research presented in this study, any form of standardization of curriculum has been shown to have a negative impact and should be avoided. The Association of American Colleges and Universities (AAC&U) and CHEA jointly developed six principles to quality improvement in higher education. Principle 2 states, "each college and university (and major divisions, schools, and programs within them) should develop ambitious, specific, and clearly stated goals for student learning appropriate to its mission, resources, tradition, student body, and community setting" (Association of American Colleges &Universities & Council for Higher Education Accreditation, 2008, p. 2). This report further states that no external agency should set quality standards for higher education institutions – this must be an internal determination (Association of American Colleges & Universities & Council for Higher Education Accreditation, 2008).

It is accepted that defining what knowledge, skills, and abilities are needed at the conclusion of an academic program is actually what drives curriculum development

(Spady, 1988). This outcomes-based education (OBE) approach starts with the end in mind (e.g., exit outcomes) and works backwards – "you develop the curriculum *from* the outcomes you want students to demonstrate, rather than writing objectives *for* the curriculum…" (Spady, 1988, p. 6). This critical distinction of developing curriculum from outcomes explains the design of this study whereby data collection starts with the determination of a list of competencies. Where should students and fire service members be in terms of competency? This rhetorical question is at the point of occupation/ profession debate. Additionally, critical insight into instruction, curriculum, and student achievement can be learned and improved upon with a variety of assessment tools, which now includes the consideration of the continuation of learning after education (Boud, 2000). The lifelong learning concept that continues after education is a primary element of a profession.

Measurement versus Assessment

Making a judgment of knowledge, competency, or performance of an individual in the educational setting is complex, dynamic, and unsettled in the research community. Traditionally when we think of making a judgment about a student, one may think of grades or scoring rubrics, which is commonly called *measurement* (Delandshere & Petrosky, 1998, p. 16). Assessment, on the other hand, is a procedural process in which *value judgments* are made on a performance point (Delandshere & Petrosky, 1998). Brookhart (2004) furthers this discussion by clarifying assessment, measurement, and evaluation. states "assessment can include measurement;" however, the two terms are not interchangeable. The practice of assessment is further complicated by multi-directional demands on the intention of assessment (Delandshere and Petrosky, 1998, p. 15).

These two definitions can represent the quantitative and qualitative methodology of assigning grades or judgments on a given performance. A "low-stakes" (formative) or "high-stakes" (summative) assessment a decision will be made depending on when the performance is measured or assessed in a course (Airasian, 1988; Anderson et al., 2001, p. 247; Bloom, Hastings, & Madaus, 1971). Formative assessment allows for in-course adjustments to be made with the presentation of content to maximize learning (Bloom, Hastings, & Madaus, 1971; Anderson et al., 2001). Summative assessment occurs after the course in assigning final grades or making adjustments to the course for the next offering (Bloom, Hastings, & Madaus, 1971; Anderson et al., 2001) or to promote lifelong learning (Terenzini, 1989). It is inferred in this study that formative and summative assessment occur at the course level, while program evaluation occurs at the conclusion of all coursework in a particular degree program. The assessment procedure in this study is a form of summative assessment (after learning has occurred) where a judgment is made of a competency.

Commonly, measurement theory involves formative and summative assessment and is the process of assigning a numerical value to student submission in a course or at the end of the course (Delandshere & Petrosky, 1998; Narens & Luce, 1986). Measurement theory is "grounded in statistical theory," still commonly includes the process of generalizations to the broader scope of the measurement sample (Delandshere & Petrosky, 1998). However, measurement theory limits the judgment about a student's performance to statistical values representing simplistic behaviors, and thus, limits the ability to assess the depth of knowledge (Delandshere & Petrosky, 1998). Limiting assessments to a single numerical score "are poor representations of complex events" and

are not based on evidence (Delandshere & Petrosky, 1998). Additionally, the numerical score is considered to be "a process of *recognition* rather than one of *interpretation*" (Delandshere & Petrosky, 1998, p. 21).

To briefly contextualize knowledge; knowledge can be defined as "*factual*, *conceptual*, *procedural* or *metacognitive*" and can be viewed in terms of progressing from concrete to abstract knowledge, in which Anderson et al (2001, p. 27) call the "Knowledge Dimension." By incorporating the Knowledge Dimension with a Cognitive Process Dimension – a revised framework of Bloom's Taxonomy – a two-dimensional Taxonomy Table promotes a greater understanding of how course objectives and learning outcomes fit into the assessment process (Anderson et al., 2001). Course objectives are what is intended to be learned, while learning outcomes are statements of what was learned (Anderson et al., 2001; Suskie, 2009).

Authentic Assessment

With accountability a core element in the regional accreditation process, discussions have arisen as to the best way to determine how assessment might be done. Once such rising concept is *authentic assessment*. Authentic assessment is the process of judging complex performances by students at certain stages of their education. Complex performances should reflect real-world situations from a field of study. This study will adopt the interchangeable use of the terms *authentic assessment* and *performance assessment* as presented by Tanner (2001, p. 74). Authentic assessment focuses on higher learning concepts from Bloom's Taxonomy (e.g., analyze, synthesize, evaluate, create) instead of the simple recall of information associated with the levels of remember and understand.

Authentic assessment requires students to formulate solutions to real-world problems in a way that goes beyond learning in the classroom. Direct application of theory into practice is a foundation of authentic assessment. Assessment needs consistency in how the performance is designed to help reduce reliability and validity concerns, and discrete activities need to be defined to create a direct path and consistency in the standard to be assessed (Tanner, 2001, p. 58). For administrative fire officers, complex performances should reflect the expected knowledge, skills, and abilities as they relate to the workplace.

Judging complex performances requires a robust process of assessment that is not met by the application of an analytic scoring rubric. Two possible means to assess graduates of educational programs are capstone courses and portfolios. Summative assessments in capstone courses and portfolios may not be used in all educational programs, but offer promising results. Some refer to this as mastery or mastery of learning assessment (Airasian, 1988; Association of American Colleges & Universities, 2007; Beck, Skinner, & Schwabrow, 2013; Boud, 2000; Ewell, 2002; Jonsson & Svingby, 2007; Lumina Foundation, 2014). In a capstone course, students produce work (assignments) to demonstrate competency of program objectives. The assessment of this is defined as the learning outcome. Realistically, a complete representation of what students have learned is not possible or desired (Suskie, 2009, p. 37). A best practice is to provide the most accurate judgment on their competency through performance-based assessments and declare the estimated measurement error (Suskie, 2009).

The second is with a portfolio where a collection of artifacts is assessed to determine the competency of a graduate (Rogers & Chow, 2000). In addition to being beneficial in the

assessment process, portfolios promote learning (Suskie, 2009). The use of portfolios is growing in popularity and provides an unobtrusive means for assessment. The extent of the use of portfolios in fire-related academic programs was not a point of data collection in this study. Determining where and how complex performances are assessed is, and should remain, a decision of each program.

It was determined that a distinction between competency and proficiency was needed. A competency can be narrowly defined to a task or skill within an overall performance. A competency could be referred to as a dimension, which is a scope, range or aspect of which something is (Merriam-Webster, 2014). Furthermore, the Lumina Foundation (2007, p. 33) states the term competency does not go far enough in capturing the expectation of graduates to not only meet a skill standard "but a demonstrated commitment to further learning." Basically, graduates "should be *proficient* in their fields of study…not simply *competent*" (Lumina Foundation, 2007, p. 33). Support of this distinction is found in the definitions in Merriam-Webster (2014) where being competent is the ability to function in a specific manner, while being proficient takes competency to a more expertly development ability. Proficient could be considered mastery level of performance that is a superior performance in which a person has the "possession or display of great skill or technique" (Merriam-Webster, 2014, p. 764). Therefore, a competency is used to describe the complex performance, while mastery is used to describe the achievement of proficiency.

There is a common sense expectation in this study that data from academic programs have generally lower ratings than those of fire officers. However, the comparison does not represent the lens in which the assessment is being conducted. Academic program

data looks through the lens of academic performance, while fire officer data looks through the lens of actual real-world situations. Therefore, any comparison of performance between students and fire officers should consider this context. A study examining this comparison directly would need to be specifically designed to control factors that may influence this relationship and create an untoward bias.

Fire Service Professional Development

Professional development is a personal quality improvement process in one's career (Kern, 2011). The development plan should include education, training, and experience items to support professional growth and to master job performance expectations (International Association of Fire Chiefs, 2010; National Fire Protection Association, 2018c). The development plan should span each rank in a department and the level of achievement desired. As stated in the training and education section, this process can be confusing to traverse. With no national standard to follow, each member is left to determine the best course of action. This is a significant hurdle for the fire service if professionalization is to occur. To professionalize, the fire service must capitalize on the existing core components of professional development. These components vary across fire service organizations that advance professional development to fire service members. As stated in the *Wingspread III* report, progress has been made (The Johnson Foundation, 1986, p. 6); however, the solution may have been too simplistic to meet the complex environment (Houle, 1980, p. x) in which the fire service operates. In the study of professions, Houle (1980) states,

> In fact, many people are growing irritated by what seems to them to be a mindless proliferation of courses and conferences, each of which may be valuable but which are not collectively undergirded by any unifying

> conception of how education can be used in a mature, complex, and continuing way to achieve excellence of service throughout the lifespan. (p. x)

It is evident that a national collaborative effort is needed in professional development to bring some clarity to the differences so firefighters and chief officers can develop a well-rounded professional development portfolio. Not all training equates to educational credit. Many training sessions are too simplistic in design and do not include the rigors of a formal assessment found in academia. There are positive signs though as Onieal (2005) states the framework for professional development is in place today.

The similarities and differences that exist in the pillars, or elements, of professional development are well documented. One of the concerns with professional development is the misuse of, or interchangeability of terms. Comparing and contrasting terms is essential to ensuring they are specifically applied in a consistent manner. This process of conceptualization is essential to conducting research as follows the recommended practice stated by Babbie (2017, p. 130).

A term that is commonly misused in fire and emergency services is continuing education. Continuing education (commonly referred to as CEUs or continuing education credits) refers to a training session on skill review or the attendance at a conference where presentations are provided on varying topics. Many times continuing education is required for recertification purposes (i.e., emergency medical technician or paramedic). In these situations, assessment of learning is based on skill competency and not on the rigors of academic assessment of student learning. Equivalencies between the training and education assessment processes are not achieved. This can lead to frustration for fire

service personnel who think they should get college credit for training, when in actuality a significant gap exists. Training sessions are vital to a sound professional development portfolio, but need to be understood for what they represent. As Greenwood (1957, p. 47) states, training is acceptable for nonprofessional occupational needs; however, professions require "formal education." Training is a critical pillar to professional development, and, although it most likely does not equate to educational credit, it is vital to maintaining a proficiency of a variety of skills required of fire service personnel.

Training, as alluded to, is conducted in classes or sessions by agencies that may or may not have accreditation. Accreditation of certifications granted after training has made significant positive progress in the fire service. The two accrediting entities are IFSAC and the National Board on Fire Service Professional Qualifications (Pro Board).

Experience is also a vital element in a well-rounded professional development portfolio (Strickland, 2003, p. 280) and improves decision making as fire service members promote from novice to expert decision makers (Gasaway, 2008; Klein, Orasanu, Calderwood, & Zsambok, 1993; Moschella, 2008). The International Association of Fire Chiefs (IAFC) Officer Development Handbook (ODH) provides a guideline of experience in agency operations for each of the four levels of fire officer that are progressive in nature (International Association of Fire Chiefs, 2010). For example, the Administrative Fire Officer (Level III) is recommended to have "three to five years" experience as a Managing Fire Officer (International Association of Fire Chiefs, 2010, p. 41). As stated previously, one example of the importance of advancing professional development for fire service personnel can be related to the concept of the societal

decision maker who encounters risky, stressful situations while making difficult decisions on behalf of others (Lichtenstein, Gregory, Slovic, & Wagenaar, 1990).

Each of the pillars must exist to advance the intellectual knowledge and decision-making capability of individuals. The advancement of intellectual knowledge has been discussed and is the primary focus of this study. Studies of decision-making in the fire service and disaster response have been published (Bayouth, 2011; Gasaway, 2008; Klein, Calderwood, & Clinton-Cirocco, 2010; Lichtenstein, Gregory, Slovic, & Wagenaar, 1990) and are outside the boundaries of this study. The important point is the interconnection of education, training and experience on the decision making process. Considering the interconnection within the decision making process requires contrasting terms because of the common interchanging of use. Comparing and contrasting the three pillars of education, training, and experience promotes a greater understanding of their complementary nature in the professional development process.

Professional Development Framework

There are several guiding documents that provide a framework for the professionalization of the fire service. While these documents need to be used, expanded, and updated for tomorrow's fire service; they are the foundation in meeting the criteria of a profession (Onieal, 2005).

NFPA 1021, the IAFC ODH, and the Center for Public Safety Excellence (CPSE) professional credentialing processes are complementary guiding documents for fire officers at each of the four levels. These documents provide the fire service with the

framework for achieving professional status and are the basis for the list of competencies (or dimensions) used in this study. No new competencies were developed.

None of the preceding documents from the NFPA, the IAFC ODH, or the CPSE credentialing process are legal mandates for any member of the fire service to meet any of the stated criteria within these documents. For example, NFPA 1021 Annex A.1.3.5 (National Fire Protection Association, 2014, p. 15) specifically states the education of fire officers is recommended, and not required. Additionally, the CPSE states "a strong educational background" is one of the requiring elements in successfully achieving a designation (Center for Public Safety Excellence, 2013, para. 3).

While this framework is a positive step to outline the recommendations for fire officer education and professional development, it falls short in meeting the criteria of the fire service becoming a profession. Until this criterion is fully embraced, adopted and implemented within the fire service, achieving profession status will not be successful.

As stated above, the CPSE has developed a professional credentialing process for five position types – Chief Fire Officer (CFO), Chief EMS Officer (CEMSO), Chief Training Officer (CTO), Fire Marshal (FM), and Fire Officer (FO) (Center for Public Safety Excellence, 2013). The credentialing process also includes training and community/professional involvement.

In the IAFC ODH, professional development is stated as "…the planned, progressive, life-long process of education, learning, self-development, and experience" (International Association of Fire Chiefs, 2010, p. 1). These pillars, or elements, of professional development are separate, but complementary in function to growing fire service

personnel. Each must exist for the fire service membership to make the claim they are professionals. Without a well-rounded portfolio of life-long growth in each of these elements, individuals in the fire service will continue to be referred to as an occupation and not a profession.

Training and Education in the Fire Service

Training and education play a critical role in the modern workplace and in occupations recognized as professions. Training and education and are not interchangeable terms and are at times confused. The terms training and education are conceptualized in this study as 1) training refers to the technical skills specific to fire service operations; and 2) education is the advancement of academic, intellectual knowledge of general and core educational coursework done in higher education institutions (International Fire Service Training Association, 2012; Merriam-Webster, 2014; National Highway Traffic Safety Administration, 2000; Strickland, 2003; Thiel, 2012a). Training classes are documented on training records and at times with certifications. Educational institutions provide courses based on semester hours to qualify for educational credit.

It is commonly known that some training sessions (e.g., department training, conferences) are as simple as sitting in a room listening to a presentation for a defined period of time. Some training sessions will have hands-on skills or other practical applications. These hands-on skills or practical applications are many times found in job performance requirements (JPRs) and some are defined in the NFPA consensus standards (e.g., National Fire Protection Association 1021). The training records of fire service

members can be extensive, but a stack of certificates does not equal an educational degree or even educational credit.

To determine if training is equivalent to educational credit, an examination of the American Council on Education (ACE) process. The ACE process is a comprehensive examination of equivalency for recommendations to be made about what training can be accepted for educational credit (American Council on Education, 2018a). The ACE College Credit Recommendation Service determines if college equivalency can be recommended, and if so, at what college level, under what topic, and for how many credit hours (American Council on Education, 2018a). It should be recognized that this is a recommendation and not a mandate. The United States Department of Education (US DOE) states that each educational institution determines what credit they will or will not accept.

Examining the ACE website for fire service entities, it was surprising to see very few. The six fire service entities with an ACE recommendation include, but are not limited to, the following (listed in alphabetical order):

- Blue Card
- Fire and Rescue Training Institute, University of Missouri
- Fire Department of New York City
- National Emergency Training Center, Emergency Management Institute
- National Emergency Training Center, National Fire Academy
- Texas Engineering Extension Service (TEEX)

ACE (2018b) provides a full list of equivalencies from these and other organizations on their website. When examining the list of ACE recommendations, not all certifications are given the same recommendation. Each training entity is provided an individualized ACE recommendation based on their training requirements. This means that a fire service training certification by different training entities can receive different college credit hours. This inconsistent application of ACE recommendations highlights the issue under discussion and the work that needs to be done.

Education advances what is learned in professional training and gained in experience. Undergraduate education (i.e., associate and bachelor degrees) provides learning for personnel to begin to understand the why's of an occupation in addition to the how's. Graduate (master's and doctoral degrees) education advances this understanding of the why's of an occupation for personnel to function as an executive of an organization and in conducting formal research. Formal research is defined by Leedy and Ormrod (2016, p. 2) as a "systematic process of collecting, analyzing, and interpreting information" Conducting research through analytical processes is one of the core competencies listed in this study as best learned in education and as agreed upon by a focus group of fire service subject matter experts (SMEs). While formal research is typically affiliated with graduate-level degrees, an introduction to research is needed in bachelor-level education. It is at this introductory level that this study examines the competency of analytical research. "Unless the fire service leadership enjoys more professional credibility, critical decisions affecting the fire service will be made more frequently by external actors (e.g., courts, elected officials) without the benefit of the fire service perspective" (Federal Emergency Management Agency, 1987, p. 24). Sitting idly by while critical decisions

are made for the fire service is already having dramatic consequences, such as the regionalization, consolidation, privatization, and devolution of fire departments as presented in Chapter I.

The importance of education in the professional development and professionalization processes in the fire service is well documented (Broman, 2008; Bryan, 1977; Clark, 1993, 2003, 2004, 2005; Ditch 2012; Granito, 2009; Iliescu, 2008; International Association of Fire Chiefs, 2010, 2015; Moschella, 2008; Onieal, 2005, 2015; Poulin, 2009; Shaw, 1896). Developing a professional development path for all firefighters to advance their training, education, and experiences is one element in professionalizing the field. The National Fire Academy's Professional Development Model pyramid provides a stepwise process for firefighters, but stops at a master's degree; doctoral degrees are not included (Federal Emergency Management Agency, 2017). As stated previously, doctoral degrees are needed within the membership of the fire service in order to gain credibility in the research field (Clark, 2004).

To expand on this, at each level of training and education for the United States fire service, competencies are listed as recommendations or guidelines from the three major fire service entities – the NFPA, IAFC, and CPSE. There is no consistent application of what professional training, education, and experiences for fire service members should be at any rank. Recommendations do not provide the needed standards for practitioners. In order to professionalize the fire service, standards will have to be set with an authority to regulate. This is a critical element to the professionalization process, but one that will most likely not come easy. The alternative to this is less attractive than working towards setting the future of the fire service on a trajectory of stability. In addition to education,

the future of the fire service will depend on individuals gaining the needed elements of professional development and stay up-to-date (Onieal, 2014, 6:50-7:00 in video). Onieal (2014, 9:05-9:15 and 44:00 in video) goes on to state that the fire service will become a profession when the fire service has the right to determine if its membership is meeting the performance standard set by the industry and not by the jurisdiction [fire department] served. This statement is in line with the historical literature on criteria for professions. Comparisons with the educational process in medical schools, the military, and the emergency medical services system are provided to help contextualize the establishment of competencies, while decentralizing the design of curriculum and giving the educational institutions the flexibility and creativity to ensure their students are successful (Association of American Medical Colleges, 1998; National Highway Traffic Safety Administration, 2000). Exploring these issues in the fire service provides an overall picture of an occupation and an established framework that could professionalize the field.

Presenting what competencies a firefighter or fire officer has is currently determined locally. This local application of what is best for a jurisdiction needs to be considered in the overall discussion of professionalizing the fire service. Which is better for the fire service – certification or licensure? It has been stated that "the focus of licensure is for public protection" (Buckendahl, 2017, p. 6). Whether this level of third-party regulation is necessary, or if certification is acceptable, is still to be determined.

Second, a profession is not as simple as stating so or basing it upon a unique set of skills. In order for an occupation to be considered a profession, several elements must exist, be fully justified within the established authority of jurisdiction (Vollmer & Mills, 1966),

and persuade the public to accept them (Wilensky, 1964). As will be discussed, summations of literature show there is not a single criterion of a profession; therefore, different propositions of criteria will be presented for consideration. These elements have been modified and challenged over the years. One specific element will be highlighted in this study is the relationship of education to the fire service.

The United States fire service has mixed success in promoting post-secondary education in its membership in order to professionalize the occupation. First, there is not a consistent approach to training or educational job qualifications of firefighters or fire officers in the United States. Granted each state has a recognized training authority certifying fire service members with many different specializations (e.g., firefighter, fire officer, fire inspector, hazardous materials, technical rescue). But, each authority having jurisdiction determines what training certifications a firefighter or fire officer will hold upon entry to and in the promotional process within the jurisdiction. The lack of consistency seen in the training process extends to academia. It can be argued that the United States fire service is not adequately protecting citizens from untrained or unregulated servants. It only takes one well-timed argument to influence change. "Emerging professions have the responsibility of persuading their state legislators of the necessity to protect the citizenry from unlicensed or unregulated practitioners who do not have the requisite education, training or competence for safe and effective practice" (Buckendahl, 2017, p. 1). Implementing regulatory change of certification or licensure within the fire service will promote an image of an emerging profession.

Some workers can adequately perform entry-level, low technical skill positions with minimal training. Some work positions require high technical, or even specialized, skill

set. Training in these highly technical fields can last years and include refresher training to keep the skill set in a state of readiness. Firefighters in the United States can fit into the high technical skill level achieving different certifications (i.e., firefighter, hazardous materials, technical rescue qualifications) at different levels (i.e., operator, technician). The level of training of firefighter in the United States is not consistent and not mandated. The authority having jurisdiction makes the determination of what training is needed. If a person achieves a firefighter certification, there is no guideline or mandate that the training be keep up-to-date. This does not mean that training within a department does not occur. It simply means that it is not required by a regulating entity where competency must be shown. If the public wants to know what performance or competency standards there are for the firefighters (any rank) in their community, the answer would be none. The fire service in the United States does not have mandated performance or competency standards. This does not prevent individual fire departments from adopting their own version of performance or competency guidelines or standards. Each authority having jurisdiction determines what job qualifications will be used in the hiring or promotional process. Furthermore, job qualification competencies of firefighters and fire officers are also determined by the authority having jurisdiction. There is not a national consensus of what these positions entail.

Similar to the inconsistent training of firefighters in the United States, there are no educational standards for the fire service. This again is left to the discretion of each authority having jurisdiction. With no consistent application of firefighter training or education in the United States, reporting results of performance or competency assessment is not possible. Providing some level of performance or competency

assessment information, that is consistently applied across the United States, has the power to quantify and qualify the validity of public services provided. Credentialing of fire department members is one way to quantify and qualify competency, but the setting of what a competency is, is not consistent across the fire service entities in the United States. Fire departments quantify and qualify themselves for voluntary accreditation recognition, at times benchmarking performance against best practice or other similar fire departments. This recognition is prestigious, but again it is not mandated.

The lack of consistent training for firefighters in the United States leads to the discussion of the fire service being an occupation, not a profession. Professions have criteria to be recognized as such. Granted, there are different perspectives on how professions are defined across all occupations, as will be discussed. Also discussed, will be the framework that exists in the fire service to professionalize. As challenging as the professionalization process may be – it is possible, and it has been called for repeatedly by fire service experts for too long. Semantics matter in the discussion of the professions and with the assessment of competencies. The two topics of *profession* and *assessment* are undeniably connected. Therefore, this research study will discuss both in an interconnected manner.

Public service is not static – as noted by those who discuss the old and new public service (Bowman, West, Berman, & Van Wart, 2004; Onieal, 2014). The creation of formally recognized professions for public safety in meeting today's global society is one discussion that needs to be continued. The term practitioner has been used to describe those members admitted to a profession. A practitioner is licensed to practice in a profession, must maintain competency of the field, and must be periodically relicensed to

continue working in a field. "Professional status demands that we develop a body of knowledge founded upon rigorous academic research and subject to scrupulous peer review and replication. "Until or unless that happens, the fire service shall forever remain a vocation because we will never know the truth" (Onieal, 2007, p. 5).

"There is perhaps nothing more critical to the future of the fire and emergency services than embracing the value of higher education for developing the next generation of fire service professionals, both career and volunteer" (Thiel, 2012b, p. 264). The literature in this study makes the explicit correlation between higher education and the professions. On the surface it may appear that fire service education is on the right path. There are numerous regionally accredited higher education degree programs (see for example Dissertations and reference to higher education from others). However, upon closer examination, there is no clearly defined path, aim, or goal of fire service education. Major fire service organizations promoting training, education, and credentialing only have guidelines or recommendations for qualifications; but, collectively, the influence on fire service education has no overarching direction (Onieal, 2005). As the NFPA (2014, p. 15) states "…educational milestones are included only as recommendations for the development of fire officers and should not be viewed as requirements." Figure 2 provides a list of educational degree recommendations per fire officer level.

Figure 2. Fire Officer Education Recommendations.

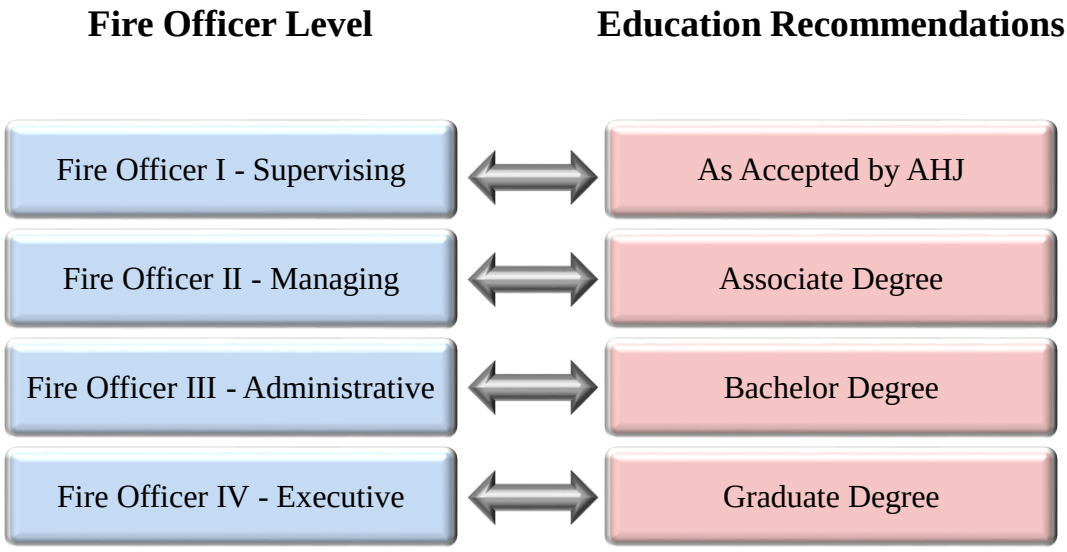

Figure 2. The education recommendations listed in NFPA 1021 are correlated to the Fire Officer Levels listed in the CPSE and IAFC.

To compound the issue of not having nationally accepted qualifications, there is a lack of emphasis in the fire service on promoting or attaining a post-secondary education. Two employee development models showing a historical view emphasizing 70% on education, 20% on mentoring, and 10% on experience; and a newer view emphasizing 10% on education, 20% on mentoring, and 70% on experience are illustrated by the IAFC (2010, pp. 4-5). While it appears the newer model is endorsed as "…the best way to develop competencies…", the IAFC (2010, p. 5) concedes that "what is not clear from the data is the relationship between education, mentorship, and experience in developing employees." This contradiction adds to the confusion of the goal of education in the fire service. It is evident that empirical research on this relationship in the fire service is needed and would be an essential element in a national collaborative effort to develop

educational goals and outcomes. Professional development is lifelong learning that should be promoted when discussing the education of fire service members.

To build on the lifelong learning process, Houle (1980, p. 14) states that building competence and capacity in decision-making is needed to ensure society's complex problems can be handled. Decision-making capacity of fire officers includes the concept of the societal decision maker who encounters risky, stressful situations while making difficult decisions on behalf of others (Lichtenstein, Gregory, Slovic, & Wagenaar, 1990). In addition to lifelong learning, recurring competence testing is gaining in popularity across the professions (Houle, 1980). Shaw (1876, p. vii) also states,

> …suddenly seized with an idea, which, being unaided by education, develops itself into a theory of the wildest kind, involving those who follow it in utter ruin – and all because the supposed theory turns out to be no true theory at all, and nothing better than the excrescence of an uneducated or eccentric intellect.

The fire service is progressing in many areas, such as firefighter health and safety as seen with the research agenda (National Fallen Firefighters Foundation, 2016) and reducing the effects of fire (United States Department of Homeland Security, 2016, p. iv). Historically, the fire problem has been the focus of national fire service reports with little reference to emergency medical services (The Johnson Foundation, 1966, 1976, 1986; International Association of Fire Chiefs Foundation, 2006; National Commission on Fire Prevention and Control, 1973; National Fallen Firefighter Foundation, 2016; Volunteer Firemen's Insurance Services, Inc., 1996). However, since 1986, the NFPA (2018b) reports that fire departments have seen a significant decrease in response to fire calls, while all other call types have increased. Mitchell recognized this fact in the report to

Congress and stated the fire problem is significantly less today than some 30 years ago (United States Department of Homeland Security, 2016, p. iv).

What is evident from the literature is that the fire service needs to change its approach to higher education. First, is the fire service solely concerned about "the fire problem" mentioned in the *Wingspread* and *America Burning* reports? Simply looking at local governments' emergency operations plans or fire departments' strategic plans would provide a solid no answer to the question on the fire problem. It is more common to see the term *all hazards* response associated to the mission of fire departments (Thiel, 2012a). As Ernest Mitchell states the fire service roles and responsibilities are changing in scope and quantity, and that "firefighters are all hazards responders" (United States Department of Homeland Security, 2016, p. iii). Limiting the scope of practice of a fire department to "the fire problem" is out dated and ignorant of what the public expects of its emergency response system and the firefighters that deliver this service

A study of other fields demonstrating progressive ideas can provide valuable insight into how to move the fire service to a more highly educated emergency response discipline. As stated, the majority of emergency responses are medically related (National Fire Protection Association, 2018b); therefore, in developing a plan or agenda to improve fire service education, an examination of medical schools and the emergency medical services system is considered. For the medical field, the Association of American Medical Colleges (AAMC) (1998) provides a best practice in setting this compass heading for colleges and universities. The AAMC does not stipulate standardized curriculum, but does state it worked with the medical community to achieve a "consensus…on the attributes that medical students should possess at the time of

graduation" (Association of American Medical Colleges, 1998, p. 1). By achieving consensus on a mission and four objectives of graduates, the AAMC have given medical schools a compass heading so they may develop their unique objectives and curriculum (Association of American Medical Colleges, 1998, p. 3).

If using the medical field as a guiding discipline is deemed not equivocal to the fire service; then an examination of the emergency medical services (EMS) education system should be acceptable. Today's fire service mirrors what the emergency medical services system realized in 2000, in that there "is no formal EMS education system in which the components are clearly defined…" (National Highway Traffic Safety Administration, 2000, p. 5). To illustrate, the EMS *Education Agenda for the Future: A Systems Approach* (National Highway Traffic Safety Administration, 2000, p. 15), captures the past, present, and future of EMS education. The progression of a systematic EMS education system is profound. It was recognized that broad consensus was needed in the EMS field and in higher education to achieve future goals. A national direction for EMS education was achieved, which includes flexibility at the local level of EMS education delivery (National Highway Traffic Safety Administration, 2000). It was recognized that "defining the entire domain of out-of-hospital medicine" does not exist, but defined scopes of practice do (National Highway Traffic Safety Administration, 2000, p. 21). The fire service is in need of this type of collective direction in education.

The EMS system has seen tremendous growth in the past 30 years, but had a planning process that systematically did not keep pace (National Highway Traffic Safety Administration, 1996). In 1996, with the publishing of *Emergency Medical Services Agenda for the Future* (referred to as the *Agenda*), a vision for the future of emergency

medical services was developed and included fourteen (14) attributes – one of which is the education systems (National Highway Traffic Safety Administration, 1996). The *Agenda* promotes a recognition that the education systems need to adjust to the sophistication and complexity of emergency medical service delivery.

Following the *Agenda*, came a collection of interrelated documents, each with a specific focus to address changes in the training, certification, education, accreditation, and research areas (National Highway Traffic Safety Administration, 1996, 2000). The first, and most significant document to this study, was the *Emergency Medical Services Education Agenda for the Future: A Systems Approach* (referred to as the *Education Agenda*) (National Highway Traffic Safety Administration, 2000). The *Education Agenda* stated "…the absence of a structured education system has resulted in considerable state-by-state variability in EMS education and licensing standards and a lack of clear-cut future direction" (National Highway Traffic Safety Administration, 2000, p. 5). Again, the fire service today is where the EMSs were 20 years ago.

The EMS education system attempted to standardize curricula, but learned it did not work and has moved into a more flexible instructional design (National Highway Traffic Safety Administration, 2000). Research has shown standardized curriculum in a variety of education levels has not worked (Airasian, 1988; Eisner 2002), and is not a cure for the education system (Brooks, 1991, p. 164). The fire service needs to move beyond trying to standardize curriculum or any recognition of such. It is time to focus on how assessment practices can move fire-related education into the future while meeting the reporting mandates of institutional and program accreditation criteria.

For example, for a period of time, the National Standard Curricula (NSC) used in EMS education was prescriptive, to the point that curriculum was strictly followed by educators (National Highway Traffic Safety Administration, 2000). The recommendation to replace the NSC with a more flexible educational approach will improve the quality of education while maintaining competency-based terminal objectives (National Highway Traffic Safety Administration, 2000). "The standards will be designed to encourage creativity in delivery methods such as problem-based learning, computer-aided instruction, distance learning, programmed self-instruction and others" (National Highway Traffic Safety Administration, 2000, p. 25). The NSC in EMS education was determined to have "decreased flexibility, limited creativity, and made the development of alternative delivery methods difficult. The strict focus on the NSC may result in the development of narrow technical and conceptual skills without consideration for the broad range of professional competencies expected of today's entry level EMS providers" (National Highway Traffic Safety Administration, 2000, p. 25). This approach ensures academic freedom rights are protected, quality instruction is achieved, and reciprocity across programs can be achieved.

Higher education is viewed as a means for achieving professional status, but also as a core element of professional development. The research literature on higher education in the fire service is limited. Initial studies of this relationship began in the late 1960s and into the 1970s (Bryan, 1977), where the focus was on analyzing student populations and how well the fire problem could be solved through education. More recent work includes several doctoral dissertations (see for example, Athey, 1994; Ditch, 2012; Hicks, 2014; Iliescu, 2008; Moschella, 2008; Sturtevant, 2001) which produce an insight into the

relationship between higher education and the fire service. These studies are advancing the body of knowledge needed in the fire service, but much more is needed. For example, all of these studies examine students, educational topics and curriculum, and educational programs; however, literature is lacking on the relationship of education to the workplace and on the assessment of competencies of firefighters or fire officers.

Student learning outcomes in this system are defined by each institution as are the levels of expected student performance (Council for Higher Education Accreditation, 2003). Academic programs typically involve advisory boards to ensure student learning outcomes, curriculum, and the delivery of instruction remain current and in-line with the stated mission and goals (Iliescu, 2008; International Fire Service Accreditation Congress, 2018a). For a regionally accredited fire-related degree program to achieve program accreditation from the Degree Assembly of IFSAC, involvement of an advisory board is required. The responsibility of an advisory board can vary from college to college; however, for accreditation purposes, the advisory board provides recommendations on curriculum, facilities, equipment, and technology.

The fire service is a part of a community-based response system that must adapt to its environment. The EMS *Education Agenda* documents recognition of this within the EMS field. The educational system for the fire service needs to be given the ability to adapt curriculum to local needs while ensuring graduates meet common competency objectives. As stated previously, the framework is in place to move the fire service into the future, which includes higher education. It is time to apply Kuhn's (2012) concept of challenging a paradigm of thought and examine a new way of doing business based on the scientific study of fire service education. A national fire service education plan

should prioritize research topics, similar to the *2015 National Fire Service Research Agenda* and to the EMS *Education Agenda*. As shown with the medical profession and EMS, standardized curriculum is not the answer – mission centered goals and objectives are (Association of American Medical Colleges, 1998; National Highway Traffic Safety Administration, 2000).

Standards and Standardization

A standard should not be confused with standardization and "…that setting high standards is not the same as standardization" (Association of American Colleges & Universities & Council for Higher Education Accreditation, 2008, p. 5). A standard is a criterion defined by an authority as a rule, while standardization brings a machinelike singular checklist process (Merriam-Webster, 2014). Defining a standard does not mean the process of meeting the standard is standardized. This is especially true in higher education. An example of this comes from the medical field. A medical student becomes a medical doctor by meeting the standard. The process for how the medical student got to the point of examination is not standardized. Each medical school has the right and is encouraged to develop its own field of study curriculum. This point is highlighted by the CHEA where it is emphasized that higher education in the United States is a "de-centralized, mission-based system" (Council for Higher Education Accreditation, 2003, p. 4). Critical thinking takes place during the process of meeting the standard. Meeting the standard is typically stated as student learning outcomes. Student performance in meeting a standard such as in medical school is complex and thus is defined as authentic assessment.

Accreditation of Fire Service Training and Education

Accreditation for training comes in the form of a certification process typically conducted through a training agency. Accreditation and certification are two different processes and should not be used interchangeably. The accreditation process is concerned with evaluating the training agency providing the certification. Both IFSAC and Pro Board have seals or logos affixed to the certifications distributed by them and are widely accepted within the international fire service. Readers can visit the IFSAC and Pro Board websites for a current list of accredited training agencies and their individual process for accreditation (International Fire Service Accreditation Congress, 2018b; National Board on Fire Service Professional Qualifications, n.d.). Both IFSAC and Pro Board use the NFPA Professional Qualifications as the standard for ensuring the certification process meets accreditation criteria (International Fire Service Accreditation Congress, 2018c; National Board on Fire Service Professional Qualifications, n.d.). It is up to state, provincial, or international training agencies locations as to the level of reciprocity of fire service certifications. Using this existing framework of certifications of training, the fire service already has the foundation for renewal of each certification. The issue is that there is no regulation on the recertification and the assessment of competency of any fire service member.

The sustainability of an educational institution is dependent on the ability to not only answer to an external stakeholder audience, but to develop the research to support their existence. One significant factor of scrutiny in academia comes in the form of accreditation. Without accreditation, it is possible for an educational institution to lose federal finance support. The stakes are high regarding the relationship of accreditation to

academia. Two primary purposes of accreditation in academia are accountability and quality improvement (Epstein & Hundert, 2002; Ewell, 2002; Southern Association of Colleges and Schools, 2011). The significance of accountability and quality improvement in academia can be viewed in a similar manner to the fire service professionalization process. *Regional* accreditation entities require outcome assessment reporting and the availability of these reports to the public. Much could be learned from the regional accreditation process in higher education as it relates to the fire service.

Accreditation is the validation review process to ensure quality of a degree granting institution (Council for Higher Education Accreditation, 2000) or certification granting entity. Accreditation of higher education institutions and certification granting agencies will be discussed separately due to their distinguishing elements. First, within the higher education system two entities provide recognition on different principles – CHEA or the US DOE (Council for Higher Education Accreditation, 2015). CHEA does not accredit educational institutions but provides recognition to accrediting entities and ensures these entities are following established standards for the accreditation process. CHEA promotes an academic legitimacy through its accreditation process (Council for Higher Education Accreditation, 2015). The US DOE, on the other hand, only recognizes organizations for the purpose of federal funding (Council for Higher Education Accreditation, 2015) and are commonly seen with national accreditation. Regional accreditation promotes a level of accountability to students, the public, and the government that includes a rigorous self-review process validated through a third-party review of the quality of education (Council for Higher Education Accreditation, n.d., p.

2). In addition to ensuring quality of education, regional accreditation requires assessment of student learning.

Differences exist in the accreditation of higher education institutions and programs (Council for Higher Education Accreditation, 2015) that should be closely examined to ensure clarity of what it represents. Specifically, a detailed analysis of *regional* versus *national* accreditation should be undertaken. The acceptance of a *regionally* accredited education is considered the gold standard and has broader transferability of education credits than *nationally* accredited education. Comparisons between education program should align to their accreditation type. Specific to this study, only regionally accredited programs were recruited because they meet the same assessment criteria. Organizations hiring candidates are also increasingly stating a regionally accredited degree is a requirement in job descriptions. As for differentiating between higher education accreditation types, it is recommended the US DOE recommendation be reviewed, which states,

> Accreditation does not provide automatic acceptance by an institution of credit earned at another institution, nor does it give assurance of acceptance of graduates by employers. Student should contact the receiving institution to help determine whether credits are transferrable. Acceptance of credit or graduates is always the prerogative of the receiving institution or employer. For these reasons, besides ascertaining the accredited status of an institution or program, students should take additional measures to determine, prior to enrollment, whether their educational goals will be met through attendance at a particular institution. Those measures should include inquiries to institutions to which transfer might be desired or to prospective employers, as well as any private or governmental entity responsible for licensing or certifying graduates to work in the field for which the educational program is intended. (United States Department of Education, 2016, para. 4)

Scholarly Research: Peer-Reviewed Journals versus Trade Publications

In 2007, Onieal (2007, p. 5) wrote "the fire service shall forever remain a vocation" if the ability to create a theory based research is not achieved. This position was stated in the first edition of the only fire service peer-reviewed journal – the International Fire Service Journal of Leadership and Management (IFSJLM). Producing a body of knowledge requires *formal research* and not just homework (Leedy and Ormrod, 2016, p. 1-2). Formal research is a detailed process of understanding a situation or experience through the legitimate analysis and interpretation of data (Leedy & Ormrod, 2016, p. 2).

Peer-reviewed journals are scholarly works with summations of formal research that has been conducted. Peer-review journal articles presented to the editorial staff for a vigorous review process are sometimes call *juried* or *refereed* (Leedy & Ormrod, 2016, p. 24); whereas, trade publications publish descriptive articles by members of a given field without formal research (Oklahoma State University Library, 2016). Magazines in the fire service fall under trade publication definition and are not peer-reviewed journals.

In addition to the position stated by Onieal in 2007, Granito (2009, p. 5) stated the fire service continues to lag behind in research. Granito provides some guidance on the difficulties in the professionalization process and some obstacles fire service personnel will need to overcome with a greater emphasis on education. Granito (2009) states those external to the fire service will not accept it as a profession until such a time as the fire service proves it with formal research. In order to move the fire service into the future, scholarly works will be needed in much greater numbers.

The study of the theoretical foundation of professions is needed to gain a greater understanding of the problem as stated in the *Wingspread* and *America Burning Revisited* reports as well as various renowned fire service experts. As Clark (1993, 2003, 2004, 2005), Granito (2009), and Onieal (2005, 2007, 2014) have stated, it is time to embrace professional development in the fire service where empirical research is developed and acted upon by members of the fire service. Empirical research is often associated with doctoral-level dissertations and are needed within the membership of the fire service in order to gain credibility in the research field (Clark, 2004).

The Professionalization Discussion in the Fire Service

Examining whether an occupation is a profession can be done by rating them on a continuum of the ideal-type profession at one end and the nonprofessional at the other (Greenwood, 1957, p. 46; Vollmer & Mills, 1966, p. 1). The degree at which an occupation is rated on this continuum depends on the achievement attributes accepted by society and other professions. Caplow (1954, p. 139) states the steps to professionalization are "explicit" in definition and include: (1) "the establishment of a professional association," (2) creating a new title that "can be monopolized," (3) the creating of a code of ethics and (4) the establishment of a political and legal power to protect the profession. Wilensky (1964, p. 142-146), adds "there is a typical sequence of events" of professionalizing an occupation, which are (1) provide the service that is needed at all times, (2) establish a common training program at the entry level to a profession, (3) "form a professional association," (4) obtain legal protection with clear definitions of competence, and (5) establish a "formal code of ethics" where the unqualified are removed from practice.

Criteria of a profession has been used from the inception of the medical, legal, and architectural fields into professional status (Larson, 1979) or medical, legal, and theology in the United States (Vollmer & Mills 1966, p. 2; Granito, 2009, p. 7; Millerson, 1964, p. 6). It is essential to the credibility of the fire service and its membership that an understanding of a profession or professional status is grounded in criteria developed from empirical research and not simply an unfounded claim (Flexner, 1915; Granito, 2009; p. 8).

The term professional may be contrasted to the term amateur by the remuneration for services provided (Flexner, 1915; Merriam-Webster, 2014; Vollmer & Mills, 1966). Theorists who followed in the study of professions have mostly eliminated the consideration of remuneration as a stipulation of a profession (Larson, 1979). This is significant in the fire service because of the varying types and kinds of fire departments in the United States (Young, 2012, p. 94). Not all firefighters are remunerated for their services. Fire service personnel are not separated based on the type and kind of fire department, whether they are remunerated for their services, or whether they act in a businesslike manner. Being a professional is determined by the overall development of the person with training, education, experience, and continued professional education; and possibly by the attainment of an occupation as a profession. However, using the term fire service professional to refer to only those serving as full-time, paid career members, unfairly isolates volunteer and part-time firefighters. Making such a reference from credulous information without fully considering one's credentials; or naively proclaiming an occupation as a profession conveys the essence of the problem referenced in this study. Simplistic statements like these will not satisfy the criteria established through

empirical research and creates resentment among the established professions and academia (Clark, 2004). As Wilensky (1964, p. 142) states, "…many occupations will assert claims to professional status and find that the claims are honored by no one but themselves." The expectation that fire service personnel become professionals in the ever-changing field is heard from outside the fire service (Houle, 1980, p. 5; Thiel, 2012a, p. 25-27) and from within the fire service (Clark, 2004; Onieal, 2007).

To complicate the discussion, explicit definitions of profession and professional are difficult to pinpoint. As Cogan (1955, p. 105) conveys, a single definition is not possible. Additionally, Goode (1960, p. 902) states, the debate of defining a profession continues. Even so, providing basic definitions helps contextualize the discussion. Two avenues for defining professions and professionals can be from a descriptive or a normative approach. The descriptive approach gives us *what is* in words or characteristics. While the normative approach gives us *what ought to be* in criteria. First, from a descriptive approach, Merriam-Webster (2014, p. 991) defines a profession as "a calling requiring specialized knowledge and often long and intensive academic preparation," with additional reference to the "vocation or employment" of people. A professional is "characterized by or conforming to the technical or ethical standards of a profession;" with additional reference to the remuneration or "businesslike manner in the workplace" (Merriam-Webster, 2014, p. 991).

The reference to education directly correlates to the competency of individuals who gain entrance to a profession with certification or licensure testing. This testing processes occurs after specific training and education are completed. In education, assessment of student learning is a process that occurs during and at the conclusion of learning. These

formative and summative assessment points are the primary tools for communicating student progress. Typically, students earn grades based on their performance. This process naturally corresponds to a quantitative measurement, or point value, that is then converted to a grade. Quantitative measurements are important, but do not divulge the whole story of student learning. This study will explore the qualitative aspects of student learning with a specific focus on assessing fire officer competencies. This will be achieved through interpretations of complex performances in holistically rating the level of subject mastery of fire department members or students in a fire-related baccalaureate program.

Shaw (1876, pp. v-xiii), specifically discussed in the Introduction section of his book that fire service personnel must demonstrate advanced technical knowledge that is only achieved through the educational process. Shaw (1876) proclaimed that specialized knowledge without a supplement theoretical knowledge was reckless and led to bad consequences. This dualistic approach of theoretical and practical knowledge of a professional is repeated when defining a profession (Greenwood, 1957) and when debating the status of the fire service (Granito, 2009; Onieal, 2005). Shaw's (1876, p. xiii) proclamation that the fire service should be regarded a profession was based on the presumption that fire service members were educated and skilled – that a profession could exist "if properly studied and understood." Shaw's (1876) introductory message must be taken in its entirety to gain a full understanding of his pointed stance that both theoretical and practical knowledge are necessary to the consideration of the profession of the fire service.

The second document was the Fire Brigades Pension Act of 1925 where the term professional fireman was mentioned (Fire Pensions Act, 1925). This Act did not include any reference to why a firefighter was professional; however, the Shaw (1876) book may have been the point of reference. The use of the term professional fireman was challenged by Vollmer and Mills (1966, p. 4-5) who stated the word professional was misrepresented in the Act. This study will examine this misrepresentation in more detail, providing a direct relationship of education as one means to achieve the title of professional. A profession requires more than "standardized intellectual training" as exhibited by the professional fireman (Vollmer & Mills, 1966, p. 4). After Vollmer and Mills, the next set of references reviewed are the *Wingspread* and *America Burning* reports. These are included because of their significant to the professionalization and education processes in the fire service.

There is limited literature on the criteria of a profession directly associated to the fire service. Onieal (2005) wrote a five-part series titled *Professional Status: The Future of Fire Service Training and Education,* where he discussed the professionalization process of the fire service. In Part 1 of this series, Onieal (2005, para. 11) stated the fire service still had obstacles to overcome with the most significant being "there is not one universally recognized and reciprocal system" for the fire service. The framework to accomplish this is in place but the integration of obstacles has not occurred (Onieal, 2005).

Granito (2009) wrote an article, *The Value of Research to Fire-Rescue Officers*, in which he provides a list of professional criteria specific to the fire service. This list is a

foundation for further examination in future studies if the fire service desired to continue to work towards professional status. The criteria are (Granito, 2009, p. 6-7):

1) A distinct and contributing body of knowledge which is ever-enlarging and being tested;
2) A body of relevant literature that contains the required body of specialized knowledge, which is growing, and which conveys that knowledge to practitioners through written, graphic, oral, and other means;
3) Focused and continuing study with recognized certifications;
4) A formalized research program with the distribution of research findings;
5) Maintenance and scrutiny of practitioner standards, and policing by professional associations using a quality assurance program;
6) Clearly identified professional organizations with provisions for continuing education;
7) A strong focus on improved public service.

There are a few essential points that need to be made about Granito's list of criteria. The body of knowledge specific to the field of study for the fire service is established and growing (see for example doctoral dissertations since 2000 that include, but are not limited to: Bayouth, 2011; Fonseca, 2015; Gasaway, 2008; Greene, 2016; Hall, 2010; Hicks, 2014; Iliescu, 2008; Kerwood, 2008; Moschella, 2008; Rivero, 2004; Russo, 2013; Shackelford, 2002; Sturtevant, 2001). The fire service is on the right path with the development of a body of knowledge, but much work is yet to be done.

Wingspread and America Burning Reports

The concept of professionalization in the fire service was first discussed on a national level in the United States with the first *Wingspread* report in 1966. "If professionalism within the fire service is to be achieved, then professionalization must be made a common goal toward which all fire service organizations, municipal officers associations and professional management associations can work" (The Johnson Foundation, 1966, p. 14). From this statement to today, the historical literature shows the fire service has not reached *professional* status. For example, each *Wingspread* report since 1966 has included reference to how the fire service and its members need to act to overcome this deficit.

The United States fire service first began addressing professionalism and education in the fire service with the *Wingspread* reports. The focus of *Wingspread* is the fire problem in the United States. A part of the fire problem is the ability and competency of members of the fire service in meeting the dynamic response environment. From the original *Wingspread* report (The Johnson Foundation, 1966, p. 6) it was stated there is a lack of performance qualifications and professionalism within the fire service as a whole and was critical of the credibility of the fire service leaders. This section will outline the chronological progression of *Wingspread* through 2016.

The original *Wingspread* report outlined twelve statements of national significance, which were focused on "bringing the national fire problem into sharp focus" (The Johnson Foundation, 1966, p. 4). Three of the statements directly address concerns of the professionalism and education in the fire service. These statements are:

1) Professional status begins with education.
2) The scope, degree and depth of the educational requirements for efficient functioning of the fire service must be examined.
3) Fire service labor and management, municipal officers and administrators must join together if professionalism is to become a reality. (The Johnson Foundation, 1966, p. 3).

This report from fire service experts clearly illustrates that professionalism has not been achieved in the fire service and that work needs to be done in this area. This report guided the development (The Johnson Foundation, 1976, p. 6) of the first significant United States public law addressing the education in the fire service, the *Fire Research and Safety Act of 1968*, also known as Public Law 90-259 (1968). The original *Wingspread* report was also followed by the original *America Burning* report. *America Burning* states a common theme that improvement is needed with the education of the members of the fire service (National Commission on Fire Prevention and Control, 1973, p. xi). The Commission recommends that "fire departments recognize advanced and specialized education" (1973, p. 37). It was also stated that "the academy [National Fire Academy] would function as the core of the Nation's efforts in fire service education – feeding out model programs, curricula, and information, and at the same time receiving helpful advice from those schools and the fire services" (National Commission on Fire Prevention and Control, 1973, p. 41). The intent of this statement is not clear, but taking this to mean the academy would run or mandate a standardized higher education curriculum is a misconception and contradictory to today's higher education system.

Under Title I of the *Fire Research and Safety Act*, (Fire Research and Safety Program) educational programs along with the development and support of curriculum was included. Title II of this Act (National Commission on Fire Prevention and Control) led to the Federal Fire Prevention and Control Act of 1974 that established the National Fire Prevention and Control Administration, later to be renamed the United States Fire Administration.

The *Wingspread II* report reemphasized the need for improvements in the education of fire service personnel (The Johnson Foundation, 1976). This report outlined another twelve statements of national significance with two statements directly addressing continued need for improvement in the professionalism and education for members of the fire service. These statements are:

1) A means of deliberate and systematic development of all fire service personnel through the executive level is still needed. There is an educational void near the top.
2) The fire fighter has been depressed by narrow education and confining experience on his job. (The Johnson Foundation, 1976, p. 3)

The highlights from this report within these two items was that there was a lack of national direction for education and that firefighting experience has overshadowed education (The Johnson Foundation, 1976, p. 12-14). While this report states there is still work to be done on the professionalism and education of members of the fire service, improvements have been made. There are more educational opportunities, training standards have been set, and a certification system developed (The Johnson Foundation,

1976, p. 8). Another significant development with this report is it outlined the first conceptual model of education from the eighth grade through graduate school.

The *Wingspread III* report (The Johnson Foundation, 1986) states the fire service is making progress towards professionalization, but more work is still needed. This report outlined ten statements of national significant, with one statement directly addressing the professional development of members of the fire service (The Johnson Foundation, 1986, p. 5). Post-secondary education programs have proliferated since the original *Wingspread* report. Additionally, the establishment of training standards was recognized within this report with the recommendation that those without standards should establish a similar process within specific jurisdictions. The single statement from this report is "professional development in the fire service has made significant strides, but improvement is still needed" (The Johnson Foundation, 1986, p. 5).

After *Wingspread III*, the report *America Burning Revisited* was published. This report stated that the fire service continued to suffer from a "lack of professionalism" (Federal Emergency Management Agency, 1987, p. 65). This report makes another important point on the reason to become professionalized – the fact that decisions will made by those external to the fire service, not within it. This puts the United States fire service in a vulnerable position. Since there is no systematic theory of firefighting or fire administration, decisions about how the fire service operates is open for outside influence and control. In addition to the need for initial education, this report also outlined the need for continuing education of fire officers.

The *Wingspread IV* report splits a total of thirteen statements of national importance as emerging or ongoing issues (International Association of Fire Chiefs Foundation, 1996, pp. 8-9). The report has one statement directly addressing the training and education of members of the fire service as "fire service managers must increase their professional standing in order to remain credible to community policy makers and the public. This professionalism should be grounded firmly in an integrated system of nationally recognized and/or certified education and training" (International Association of Fire Chiefs Foundation, 1996, p. 9). This report repeats the criteria of a profession as "a body of knowledge; formalized education system for acquiring that knowledge; a recognition of status; service over profit; qualification of individual competency; character; and an assurance to the public of the competence of the member" (International Association of Fire Chiefs Foundation, 1996, p. 15).

Wingspread IV states the education and training of fire service personnel is an ongoing issue. The report goes on to state that fire service personnel need to maintain an element of credibility through "nationally recognized and/or certified education and training" (Volunteer Firemen's Insurance Services, 1996, p. 15). *Wingspread IV* included four specific items were identified to continue the pursuit of professionalizing the fire service. These items are outlined below (Volunteer Firemen's Insurance Services, 1996, pp. 15-16):

1) An increase in simulation training is needed to improve skills-based knowledge.
2) Enhancing the collaborative efforts between the National Fire Academy and state training systems.

3) Education is required if a professional status is to be recognized.
4) Certification through an accrediting entity.

Wingspread V continues to highlight the need for the United States fire service to "evolve as a profession" (The International Association of Fire Chiefs Foundation, 2006, p. 2). Once again it is stated that advances have been made but that further improvements are needed. Direct reference to higher education is limited and inadequate to provide valuable recommendations for firefighters. The achievement of higher education is clearly indicated in the literature, but there is no commitment from within the United States fire service.

The latest *Wingspread VI* report, higher education is critical for fire service leaders as they are expected to work with prominent community leaders who already have higher education degrees (The Johnson Foundation, 2016). The promotion of the Fire and Emergency Services Higher Education (FESHE) model is related only to professional development programs, not higher education degree programs. Any suggestion that higher education programs be standardized in their curriculum by any entity is ill-advised and does not meet higher education best practices. It also conflicts with the guidance process of higher educational programs with their advisory boards and local jurisdictional needs.

It is evident that the fire service continues to be a work in progress with regard to achieving professional status. After fifty years of work and the fire service establishment states it has not reached professional status. As stated in the *Wingspread V* report, "the fire service needs to continue to evolve as a profession as have other governmental

organizations and the private sector" (International Association of Fire Chiefs Foundation, 2006, p. 8). This report provides twenty statements of national significance with one directly addressing the professional development of members of the fire service. This discussion on professionalization does not end here; it continues today.

Change in the Fire Service

The United States fire service has a proud tradition in which words like "selfless heroism" (International Association of Fire Chiefs, 2015, p. 5), "honor," "courage," "valor," and "self-sacrifice" are used to describe firefighters (Siarnicki & Gist, 2010, p. 2). However, there is also a destructive slogan uttered in pride by firefighters as "200 years of tradition unimpeded by progress" (International Association of Fire Chiefs, 2015, p. 11). This culture of pride and tradition where resisting change is proclaimed in defiance of our global society, may well result in the dismantling of the fire service as we know it. It was recognized in the 1970s that change was occurring faster in society than within fire service, with what was one coined a "cultural lag" with "inadequate fire protection" (National Commission on Fire Prevention and Control, 1973, p.).

The traditional United States fire service is in jeopardy of losing its sustainability to the point of extinction. Alarms bells have been sounding for years from within the fire service that change in the way it does business is a must (Federal Emergency Management Agency, 1987, p. 47; Federal Emergency Management Agency, 2002, p. 15; The Johnson Foundation, 2016) or face the reality that it serves no one. Even the meaning of the terms fire service, fire department, or fire and emergency service is in question of being obsolete to represent what the changing mission is for many fire

departments (Fire Service Based EMS Advocates, 2016; Ludwig, 2013). Some argue that not only are these terms obsolete, but the service delivery model it still utilizes is obsolete and in need of overhaul (Bowman, West, Berman, & Van Wart, 2004; County of Santa Clarita, 2011; Keisling, 2015); yet, the name of many fire departments have not changed to reflect their current mission (Federal Emergency Management Agency, 2002, p. 47; Ludwig, 2013). Additionally, questions on why more firefighters are on the job when fire calls are decreasing have been raised publicly (McChesney, 2015; Neyfakh, 2013). The public will continue to be active in the political process to force change in service delivery to meet the needs of today or "they're going to get another organization to do it" (Onieal, 2014, 20:40-20:50).

After the 1990 economic crisis, public trust has waned. Increased regulation was seen as one way to ensure the failure of self-regulation was not repeated (Sullivan, 2005). As stated in the most recent *Wingspread VI* report by The Johnson Foundation (2016):

> As guardians of life safety, the United States fire and emergency services must expect, embrace, and adapt to change by continuing to define and adopt current administrative and operational best practices. To be competitive and sustainable in a changing environment, agencies must become change agent rather than reactionaries. (p.4)

To highlight this, calls service data from the NFPA (2018b) reports that for United States fire departments between 1980 and 2016:

- Total call volume increased by nearly 24.5 million calls or 326%.
- Total fire calls decreased by 1.6 million or 45%. Fire calls now represent 3.8% all fire department calls for service.

- Total medical calls increased by 17.7 million or 450%. Medical calls now represent 64.4% of all fire department calls for service.
- Total false alarm calls increased by 1.7 million or 292%. False alarms now represent 7.4% of all fire department calls for service.
- Total hazardous materials (1986-2016) increased by 253,500 or 248%. Hazardous materials calls now represent 1.2% or all fire department calls.
- Other hazardous conditions (1986-2016) increased by 366,500 or 215%. Other hazardous conditions calls now represent 1.9% of all fire department calls for service.
- Other call types (1986-2016) increased by 4.7 million or 475%. Other call types now represent 16.9% of all fire department calls for service.

Note: the above estimated data does not include the mutual aid category, as these are considered in this study to be duplications or extensions of the original call for service by the public.

As fire departments across the United States deal with a mission away from fire, it is not necessarily a bad thing. Organizational, or fire service, sustainability is having not only an up-to-date trained and skilled workforce, but also having an educated workforce to understand the environment in which operations occur and new innovations are driven (Sullivan, 2005). Skills learned in professional training prepare personnel to enter a workforce as an apprentice (Sullivan, 2005). An apprentice in the fire service may be called a rookie, probie, or newbie. Either way, it is a person with new knowledge and skill, but with limited or no experience. Professional training, many times, is considered to be the entry-level qualifications in occupations, such as the fire service. But, does

current firefighter training accurately reflect the job and the changing mission? The answer unfortunately is yes and no. Professional training provides the basic skill set or the how to's of an occupation, but this is limited. Advanced knowledge of the occupation and of society that is learned in education is also needed (Parsons, 1937; Shaw, 1876; Sullivan, 2005). It is stated that all professional fields have seen improvement when professional training is housed in universities where cognitive skills and liberal arts topics can be covered for "…students to understand the world in order to lake a responsible part in it" (Sullivan, 2005, p. 25).

The fire service has only partially embraced this concept. The partnership between education and the workplace is critical, as it provides a foundation for the three aspects of preparation for a profession, which include a cognitive development of knowledge (and assessment of that knowledge), a clinical and practical training facilitated in the workplace, and the development of an understanding of the work and the individual (Sullivan, 2005). The university is where students (future practitioners) are challenged in their learning of the occupation as they gain a wider understanding of their place in society (Sullivan, 2005).

When exploring concepts, theories, or ideologies like professionalization of occupations, it is prudent to include paradigm challenges that have been raised. As Kuhn (2012) has described, paradigms periodically gain and/or lose support. It takes a period of "chaos" where challenges are raised, thus beginning a debate on the validity of the existing theory and the reconstruction of theory (Kuhn, 2012, p. 7). This process is also in line with Hegel's concept of thesis, antithesis, and synthesis (Denhardt, 2011, p. 21). The thesis and antithesis are opposing ideas "in a continuous process of conflict and conciliation"

that result in a synthesis (or new thesis) (Denhardt, 2011, p. 21). As Kuhn (2012) states, discovery of new theory or paradigm takes time to develop, which allows for a process of acceptance or rejection. Old paradigms are not necessarily replaced by new ones, some advance a theory in a new direction (Kuhn, 2012, p. 95).

Summary

This literature review was constructed in such a way as to establish a foundation from a view that training and education and inextricably linked to the development of specialized knowledge and skills. A workforce with specialized knowledge and skill is one foundation of a profession, where competency of the membership must be confirmed. The interconnected elements of the criteria of a profession must be validated prior to the claim that an occupation is a profession. A move towards officially professionalizing the United States fire service will be difficult, but one that needs to be concurred. The sustainability of the fire service is dependent on this action.

With this comprehensive foundation of literature, the elements of research methodology and design will be better understood. It is because of this literature that the work of collecting data, testing processes, and making recommendations is significant. The limitations and delimitations of this study are realistic in the scope of what can be accomplished and that further studies are embarked upon to expand and enhance the body of knowledge for the fire service.

CHAPTER III

RESEARCH METHODOLOGY

The complexity and challenges of conducting qualitative dissertation research led to changes in the design of this study, which will be described. The change in design is acceptable even after data collection begins (Creswell, 2013). Originally, this study was designed with four distinct qualitative data collection phases. An unobtrusive content and literature collection process, a focus group, a qualitative collection of primary data, and a follow-up interview. Phase one and two were maintained throughout the research process. The success of these two phases provided a foundation for acceptable emergent research design modification during the research process (Creswell, 2013, p. 47). This qualitative approach also followed the holistic account of complex interactions (Creswell, 2013, p. 47) of education, fire officer competencies, and the professions without consideration of a cause and effect relationship. A review of fire service documents is conducted to outline the inconsistent nature of competency criteria. These documents provide the foundation for the data analysis phase of this study, starting with the focus group which was convened in phase two. The focus group consisted of fire service subject matter experts reviewing the stated competencies from three major fire service organizations – the National Fire Protection Association (NFPA), the International

Association of Fire Chiefs (IAFC), and the Center for Public Safety Excellence (CPSE). The competencies stated from these organizations are not disputed or revised but accepted as current practice in order to develop an assessment tool. In addition to these organizations, information from the Degree Assembly of the International Fire Service Accreditation Congress (IFSAC-DA) is referenced. The IFSAC-DA is approved by the Council for Higher Education Accreditation (CHEA) to grant program accreditation to regionally accredited colleges and universities that confer fire-related degrees at the associate, bachelor, and master's levels (International Fire Service Accreditation Congress, 2018b). The purpose for utilizing regional accreditation in this study is primarily that peer-level programs are meeting the same standard of education and have mandatory reporting of outcome assessment that is publicly available.

The third phase of this study was initially to be an application of an assessment tool in accredited fire-related programs meeting both regional and program accreditation as stated above. The assessment tool was a holistic rubric with a supplemental interpretive summary of student performance at or near graduation. After the application of the assessment tool, a fourth phase was to be an interview of the program administrator (or designee) of each participating program. It was anticipated all four phases of this research project will lead to a better understanding of the fire service educational system; the occupation versus profession status; the core competencies of administrative fire officers; the assessment possibilities of these competencies; and further research needed in this area.

A significant change in the design of the research was needed due to a deficiency of data collection in phase three. Therefore, the holistic rubric was transformed into an

electronically designed qualitative questionnaire in Qualtrics and the recruitment of participants significantly expanded. The questionnaire was split into two branches – one for academia and one for fire departments. Exploring the long-standing discussion of the fire service being an occupation that had not reached the recognized criteria of a profession led to an exploration of the education of individuals serving in the fire service. The assessment of competencies of baccalaureate students and fire officers became the focus of the data collection and analysis to highlight the connection of education to the professions. The connection of all the elements of this study are significant – even what was not accomplished is significant such as the need for a research community to support future researchers. The modification of research design in phase three utilizes the Guttman scaling model for the analysis of "quantifying qualitative data" (Guttman, 1944, p. 139) and "which gives the configuration of the qualitative data," and from which the term scalogram is founded (Guttman, 1950, p. 61). Phase four was subsequently not needed and eliminated.

The roadmap of this study follows the framework for the development of a qualitative research study from Crotty (1998, p. 4) and as adapted by Creswell (2013). The four main elements described below should be viewed in a vertical (or hierarchical) presentation, and are (1) the worldview of the researcher, (2) the theoretical lens for the study, (3) the methodological approach, and (4) the methods of data collection (Crotty, 1998). Adapting this framework provides a logical progression for the development of this study.

Philosophical Worldview of the Researcher

The methodology and design of this study is from a constructivist viewpoint. A constructivist viewpoint is commonly associated with qualitative research and explores the meaning via the perspectives of individuals based on their interaction with the world (Creswell & Creswell, 2018; Crotty, 1998; Hatch, 2002). The constructivist viewpoint is also complementary to learning theory, where the learner constructs knowledge through an epistemological approach (Schunk, 2012, p. 229). Additionally, the constructivist viewpoint fits well into the realm of fire service training and education as individuals develop meaning of situations, concepts, and techniques. Using the constructivist lens as a perspective can help understand competence as the connection between … and the real-world application of knowledge and gained from "education, training, and experience" (Trinder, 2008, p. 165). It has been stated that competency is not measured, but the standards of an occupation are (Trinder, 2008). This statement is one example of why clearly defining terms are needed. Furthermore, the constructivist lens in examining knowledge acquisition and competency can come independent of others call a "coconstruction" of the truth that is mutually agreed upon by the participants and the researcher (see for example Hatch, 2002, p. 15).

An assumption in this study is that *constructivism* and *constructionism* can both occur in fire service education. These terms should not be confused and will not be used interchangeably. To clarify, *constructivism* is a process of formulating meaning by an individual independent of others; whereas, *constructionism* refers to the collective agreement of meaning (Crotty, 1998, p. 58). More specifically, meaning is not a discovery process, but constructed mainly in a social context (Crotty, 1998, p. 42). A

degree of flexibility in this study is required as the problem is explored and understood. Flexibility and refinement during a research project are supported by Creswell (2013, 2018). In this tradition of research methodology and analysis, it is assumed influence occurs from a normative perspective, as well as from social, political, and historical perspectives (Cherryholmes, 1992; Creswell, 2013, 2018).

A constructivist viewpoint in fire service education has not been developed, let alone challenged. Appropriate paradigms are, and should be challenged in, what Kuhn (2012) describes as scientific revolutions that have periods of chaos. During these times, proposed paradigms conflict with current paradigms in a tug-of-war so to speak. The true paradigm (new or old) will prevail after intense scrutiny within a defined discipline (Kuhn, 2012). Kuhn's theoretical views of the scientific revolution is complementary to both constructivism and pragmatism in that the search for knowledge is through the questioning of accepted truths.

Theoretical Lens of the Study

The theoretical lens for this study is assessment theory. Assessment theory is a relatively recent field of study, but has its foundations from the mid-1900s from Tyler and Bloom. It was not until 1985 that the First National Conference on Assessment in Higher Education was held (Ewell, 2002, p. 7). Assessment theory is still not well defined and no consensus has been reached as to a definition of assessment (Ewell, 2002; Terenzini, 1989). Therefore, a contextualization of terms is needed that are used in this study. *Assessment* is defined as "collecting information about something to be used for some purpose" (Brookhart, 2004, p. 5). This includes having defined benchmarks in order to

make conclusions about a performance (Boud, 2000). *Sustainable assessment theory* is very similarly defined as the having long-term benchmarks for making conclusions about progress and develop students' ability to be self-critical of their learning (Beck, Skinner, & Schwabrow, 2013; Boud, 2000; Boud & Falchikov, 2006). The one point of agreement with assessment is that the purpose is for accountability or improvement (Ewell, 2002; Terenzini, 1989). Although the premise of assessment in this context refers to academic assessment, the process is directly applicable to any location of performance assessment. The educational foundation of assessment is directly applied in this study beyond the classroom to include performance of fire officers on the job with regards to ten specific competencies.

Figure 3: Theoretical Lens Possibilities.

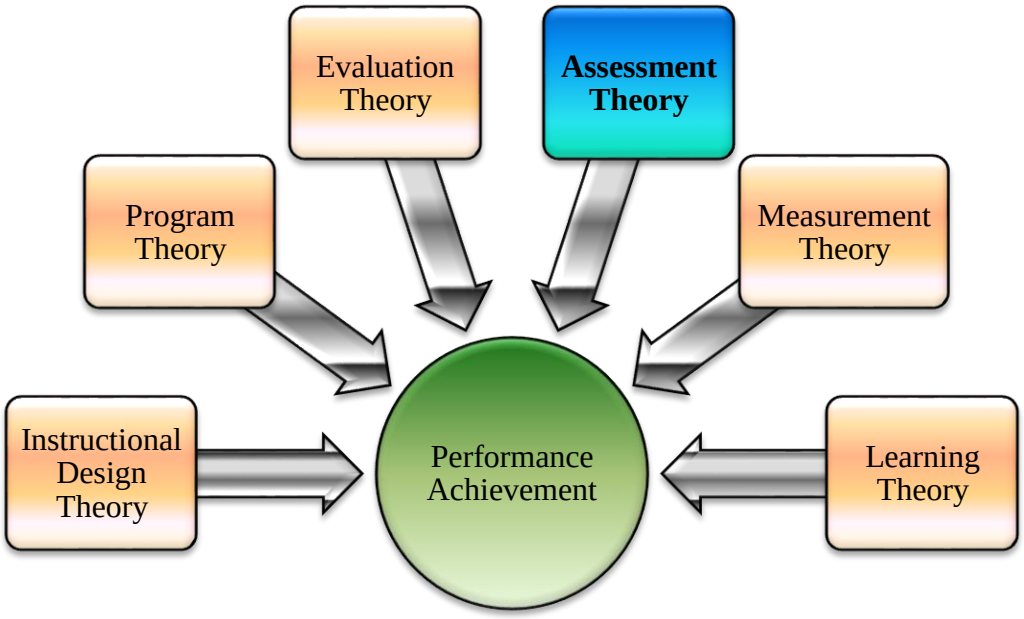

Figure 3. A visual orientation of some major theories influencing the rating of performance achievement is provided. The assumption is that other theories (e.g., item response theory) are affiliated with these major categories and would be considered subcategories.

Assessment theory in this context is primarily used for quality improvement. Performance feedback to a student or fire officer is critical to their growth and understanding of their strengths and weaknesses. It also helps the individual being assessed develop self-assessment skills where learning occurs beyond the classroom (Boud & Falchikov, 2006). Public safety occupations have situations that are uncertain and unpredictable where complex judgments and decisions must be made in a fast paced environment. Individuals tasked with making these judgments and decisions require more than training and experience. The education system is designed to provide much more than technical knowledge. It prepares individuals to not only make complex judgments and decisions, but to also understand the lifelong learning process that goes into handling these situations (Boud & Falchikov, 2006). The ratings under assessment theory do not include numbers, they are holistic, which is a way to promote a positive environment of discussing feedback. Scoring with grades (i.e., analytic rubrics) or performance measurements where numerical values are assigned for official job ratings (i.e., pay raises, promotions) have a natural negative connotation when the ratings are viewed as less than expected. Discussing feedback is limited in this type of evaluation and measurement.

Assessment theory approaches the rating of performances from different lens that puts the rater and individual being rated in the position of seeking the answer to – where can improvement occur? Seeking the answer to this question challenges the rater to provide valuable feedback and for individual being rated to be a lifelong learner. Providing valuable feedback is an area of research being examined and has been referred to as *interpretive summary* (Delandshere & Petrosky, 1994, 1998). Interpretive summaries by

a panel of judges who determine the level of and qualities of a performance were designed to overcome measurement theory shortcomings (Delandshere & Petrosky, 1994, 1998). This assessment procedure was the initial qualitative design of this study. Pushing the envelope of assessment in this manner could have provided a greater interpretation of a student's competency as it relates to their knowledge and performance in handling complex events (Delandshere & Petrosky, 1998). Delandshere and Petrosky (1998) found that using both a numerical rating (rubric) and this assessment procedure of interpretive summaries are in opposition to each other and do not provide a valuable comparison. Therefore, the analytic rubric was not included in the initial research design or the modification. Originally relating the use of a holistic rubric with an interpretive summary from a panel of judges to the fire service or academia, it is possible to create a robust system of assessment of performance. However, this process may have been too time consuming for volunteers of this study. The interpretive summary, while seen as a positive option for student and fire officer assessment, was removed from the study, as was the follow-up interview.

Due to the numerous theoretical relationships influencing performance achievement, it is essential to clarify definitions. Interchanging terms, such as evaluation, assessment, and measurement quickly lead to confusion and an inconsistent point of analysis. While assessment was defined above in general terms, it is further explained below as a comparison to evaluation and measurement. Therefore, the following terms will be used in this study.

- Assessment – at the individual-level. This process can be formal or informal, and formative (during learning) or summative (after learning) in nature. Formative or

summative assessment is provided in the form of usable feedback. A collection of assessment data informs program evaluation.

- Measurement – at the course-level. This process includes formative and summative numerical ratings. A collection of numerical ratings by measurement informs assessment and evaluation.
- Evaluation – at the program- and institutional-level. This formal process is reported on to regional accrediting bodies does not include individual student grades, but can include a statistical analysis of grades or numerical ratings from a group(s) of students. An evaluation of a program guides a judgment of value.

Figure 4: Unit of Analysis Possibilities.

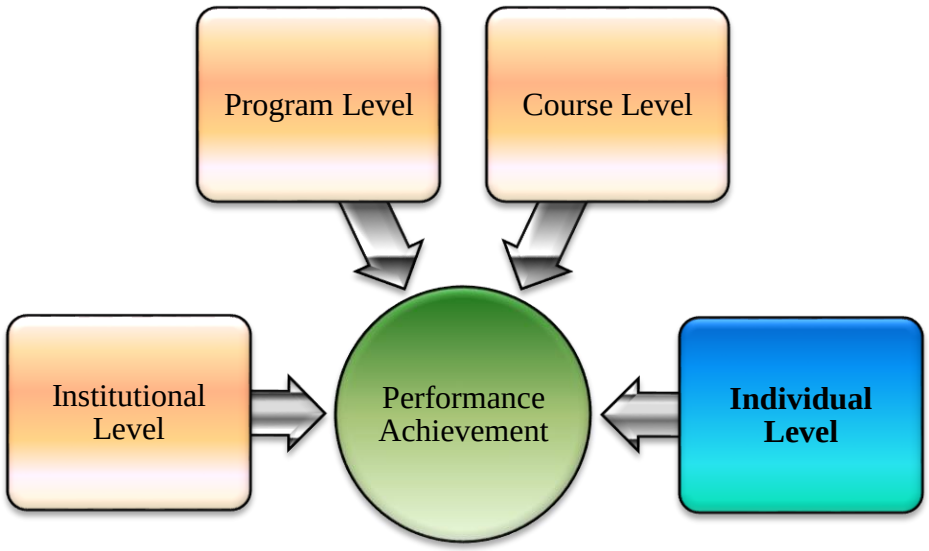

Figure 4. The individual level of the unit of analysis is provided in relation to other units of analysis possibilities. Analysis at the individual level can influence the other units through the evaluation and measurement processes.

Figure 5 below provides a summary of where different theories can be seen at each level of analysis. Not all theories are discussed here and only included as a point of reference.

Figure 5: Correlation of Theory to Unit of Analysis.

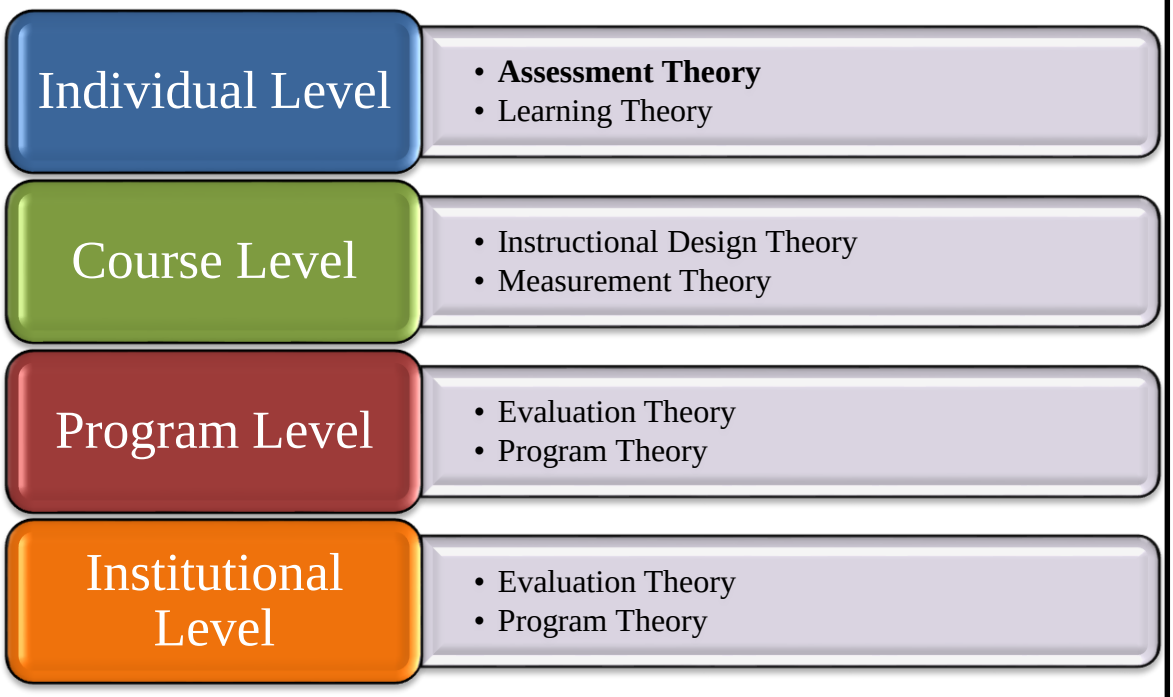

Figure 5. Viewing the theoretical foundation of assessment, learning, instructional design, measurement, evaluation, and programs in relation to the units of analysis can help guide future discussions on these areas in the fire service.

Research Methodology

The exploration process of this study is qualitative in nature and seeks to understand the "*what* or *how* rather than *why*" (Creswell, 2013, p. 138) of the assessment of competencies of students and fire officers. Descriptive data will be included to clarify the context of discussions in this study and used according to the Guttman scale analysis procedure. The qualitative research methodology provides a robust approach to an

inductive exploration of perspectives of fire service education and fire officer performance. A rigorous qualitative data validation process originally included four distinct phases – an unobtrusive measures process, a focus group, multi-case study process, and concluding interviews. As stated previously, this design required modification to a qualitative design with the Guttman scale model. The literature review sets the issue of fire service education, fire officer performance, and competencies within the broader issue of occupation versus profession discussion in order to orient the reader and to elicit further research.

Creswell (2013, pp. 47-48) provides a guide for the justification for a qualitative research methodology as the need for (1) exploring a problem and understanding the complexity of the issue, (2) bringing different perspectives to the forefront, (3) understanding the setting of the problem, and (4) theory development. Each of these needs are asked and addressed in this study.

Research Design

The overall design of this study was originally formulated around the case study approach of qualitative research. As Stake (1995, p. 2) states, a case is a functioning system with specificity and complexity. A case was defined as a fire-related baccalaureate program from a regionally accredited college with program accreditation from the International Fire Service Accreditation Congress (IFSAC). Within this general definition, this study was to further meet the "collective case study" design in that several cases are examined within the defined scope of institutional participation (Stake, 1995, p. 4). Defining the scope of institutional participation in this manner was to put the

collective cases on a comparative level with regard to a high standard of accreditation achieved and transferability of educational credits. Regionally and nationally accredited institutions and programs are not seen as equivalents and the transferability of credits is not widespread. Institutional accreditation will be discussed in more detail in the literature review.

Within the general case study design, this research was to utilize several other qualitative data gathering points. The points include unobtrusive measures, a focus group session, multi-case study data collection, and a follow-up interview. It was intended that this comprehensive collection of data and information guide an understanding of fire service education. As stated, this design required modification of phases three and four, the application of a holistic rubric and interpretive summary and follow-up interviews respectively. The open-ended questions of the interview were transformed into a questionnaire and expanded to either an academic program or to a fire department.

Assessment Procedures: A Model Design for Data Collection

The data collection process in this qualitative research project initially had four distinct phases. Using four phases addressed the complexity and depth of the expectation dissertation research. The framework was based on the Valid Assessment of Learning in Undergraduate Education (VALUE) project, which is a product of the Association of American Colleges and Universities (AAC&U); and the assessment procedure developed by Delandshere and Petrosky (1994, 1998). The approaches of these two methods are not complementary, and may actually conflict. However, it is this mixing of strengths of both procedures in a qualitative manner that was to guide the exploration of how

competencies could be assessed. Phases one and two follow the VALUE project framework for defining competencies; while phases three and four were to follow the interpretive summary procedure. It was anticipated and expected that much would be learned in this exploration process. Recommendations from this study should be put into a context of a beginning framework with mixed procedures in which modifications will be needed to meet the needs of any college or program. As seen with this study, modifications with the research design were required. The general premise of the VALUE project and the interpretive summary were maintained, albeit, adjusted along the way.

First, the VALUE project initiative from 2007 strived for a national-level dialogue on a set of student learning outcomes in which many stakeholders have a vested interest and promoted "multiple expert judgments of the quality of student work over reliance on standardized tests…" (Association of American Colleges & Universities, 2009, p. 4). The initial focus of VALUE was intra-institutional in liberal arts for assessment purposes. The development of rubrics assessing "essential learning outcomes" in liberal arts not only addressed the intra-institutional needs of assessment, but also included inter-institutional needs. The VALUE project has provided a compass heading for a national dialogue on outcomes and rubric development. The work of the AAC&U continues to grow from its initial initiative to the international use of the rubrics and to the coming operation of the VALUE Institute.

The basic VALUE project process was adopted as a model design or framework for the data collection of this study. Also adopted is the stance that there can be an agreement on learning outcomes and the criteria associated with student performance (Association of

American Colleges & Universities, 2009, p. 5). This shared vision is a core component of the VALUE project in which "metarubrics" were developed through an expressed mutual agreement of student performance (Association of American Colleges & Universities, 2009, p. 5). The process of developing rubrics with shared expectations carved a path for criteria statements to be defined for student performance. The subsequent rubrics were tested in participating educational institutions "to determine the usefulness of the rubrics in assessing student learning across the breath of essential outcomes" (Association of American Colleges & Universities, 2009, p. 5).

After testing the rubrics, participating faculty provided "feedback on the usefulness, problems, and advantages of each rubric they tested" (Association of American Colleges & Universities, 2009, p. 5). As learned in the VALUE project, it is anticipated that the collection of data in phase three and the feedback in phase four of this study would have provided insight into similarities and differences between baccalaureate programs and promote national work on the assessment process (Association of American Colleges & Universities, 2009, p. 7). In a similar manner, and as stated in the literature review, it is hoped this research project leads to a national collaborative effort of many stakeholders to bring clarity to fire-related educational programs and the authentic assessment of complex performances of students and fire officers.

Before outlining each phase in detail, a point of clarification is needed on the rubric. Rubrics developed after this study, as the ones developed in the VALUE project, should not be assumed to be a one-size-fits-all standard for assessment. Quality standards of performance can be articulated without standardization (Rhodes, 2011, p. 4). CHEA (2003, p. 6) recommends broad definitions of student learning outcomes and an

avoidance of "standardized measures of student achievement." CHEA (2003, p. 6) further recommends that "evidence of student learning outcomes…be rigorous, reliable, and understandable." It is intended rubrics be adapted to institutional needs, especially at the program and course level with descriptions relevant to the discipline (Association of American Colleges & Universities, 2009, p. 7; 2011, p. 4). AAC&U (Rhodes, 2011, p. 5) declares the validity of the metarubrics are determined by their broad acceptance as a best practice in undergraduate programs across the United States.

Second, judging complex performances of students in a capstone course or portfolio review is valuable, but inherently challenging. Complex performances are considered to be "high-stakes" (Airasian, 1988; Anderson et al., 2001, p. 247). There was a perceived need to improve the quality of education with evidence-based high-stakes testing in the 1980s (Airasian, 1988). While the educational testing processes have moved away from standardized testing, the symbolic nature of testing has not waivered. As Airasian (1988, p. 311) states, tests represent a validation of education and are connected socially – numbers matter because of the view on what educational excellence or effectiveness means in order to be accountable to the public (Delandshere & Petrosky, 1998). Furthermore, assessing complex performances are unique to the individual in a particular moment and situation, and while this inconsistency can be frustrating, it must be assumed some error in measurement will occur (Delandshere & Petrosky, 1998).

Since the 1980s, assessment procedures have steadily increased in use and are now a criterion in the regional accreditation process (Council for Higher Education Accreditation, 2006). While quantifying student performance is still expected through the use of rubrics and grades, other avenues for judging complex performances are being

explored (Delandshere & Petrosky, 1994, 1998). It is proposed by Delandshere and Petrosky (1998, p. 14) that "value judgments" can and should be made "about the quality of performances." This process includes the development of "characteristics of the performance" (Delandshere & Petrosky, 1998, p. 14). In developing a set of characteristics, Delandshere and Petrosky (1998, p. 14) state, it is imperative for influence from the discipline in which the education is founded and society help construct expectations.

The assessment procedure of interpretive summaries of performance by a panel of judges proposed by Delandshere and Petrosky (1994, 1998, p. 14) should not be the sole rating element. In order to address reliability and validity concerns with any assessment procedure, Delandshere and Petrosky (1998, p. 15) state the interpretive summary process include training for all raters. By using the interpretive summary as an assessment reporting tool and not for grades in a course, the process takes on a whole new possibility for improving student learning and the instructional design of a course or program. Interpretive summaries are viewed as case studies and "are often two to three pages long" (Delandshere & Petrosky, 1998, p. 20). These qualitative reports ensure the integrity of the performance is not lost by fitting a performance into a rubric categorization – that it maintains the value of the performance for what it was (Delandshere & Petrosky, 1998). A critical point made by Delandshere and Petrosky (1998, p. 16) is that an aggregation of scores for decision-making may be necessary across criteria of an assessment. What Delandshere and Petrosky (1998) found is a conflict in trying to use the subjective interpretive summary procedure with an objective scoring rubric in an attempt to have evidence of reliability and validity, it was found the representation of the performance

was reduced to fitting into a category. The focus or orientation of assessment was on the rubric, not assessing the complex performance (Delandshere & Petrosky, 1998). The overall value of scoring rubrics is not debated or challenged in this study. As Delandshere and Petrosky (1998) found, scoring rubrics are beneficial for simple applications. Imagine students (or fire officers) receiving comprehensive feedback in the form of an interpretive summary for the sole purpose of improvement. No grading or job related performance evaluation scoring – just lifelong learning and improvement.

While the proposed assessment procedure by Delandshere and Petrosky (1994, 1998) utilized interpretive summaries for certification purposes, fire-related education is not to the point of mandating certification of firefighters and fire officers. This central issue in the fire service has yet to be addressed. Because of this, it should not be assumed that the evaluation of performances or the rating of student learning in this study is linked to a certification process. This connection will be left to future research projects. For this study, the collection of documents from which a list of competencies was narrowed by consensus of a focus group developed are what Messick (1994, p. 17) calls a construct-centered approach in that the process should start with "asking what complex of knowledge, skills, or other attributes should be assessed." Even with a list of competencies, it is not proposed that these competencies should be a part of every academic program. It only provides an orientation for this study.

Assessment Framework

The assessment framework in this phase of the research utilizes the four components and subcomponents proposed by Stiggins (1987) and complements the model framework from the literature review of the VALUE project. The design of an assessment process is

critical to credible results of value judgments (Stiggins, 1987). Each component will be listed along with how it will be addressed in this study. The application of this framework from Stiggins (1987) is a guideline and should be applied in a manner that permits academic freedom in how each program defines a specific performance to be assessed.

1) *Clarify reason(s) for the assessment* – the reason for the assessment is to explore the process of competency assessment. In general, assessment could be used as a quality improvement process and for consistent accountability reporting for accreditation. The quality improvement process could promote positive feedback to an individual and encourage self-assessment as one develops lifelong learning habits. The accountability report could rate student performance in terms of competencies of administrative fire officers across all academic programs in the United States. This is not a method of comparing student performance, but one of overall generalizations of program performance in student achievement.
    a. *Specify decisions to be made from the assessment* – decisions from assessment in this study would be as a starting point to further assessment and competency development. In general, this subcomponent could lead to quality improvement in each program. Using assessment results is a core criterion reporting component in regional accreditation (see for example, HLC, 2017, Criterion 4.B.3), and with program accreditation (see the International Fire Service Accreditation Congress, 2018d, Criterion G23.5.6.b).

b. *Specific decisionmaker(s) using results* – decisionmakers using the results of this study would be fire service members and organizations. In general, assessment results should be used by fire service members, students, training officers, faculty, accreditors, and program administrators to improve performance in complex situations.

c. *Specific use to be made of results* – this subcomponent addresses the rankings or mastery of performers with regards to a quality improvement process and accountability. It is recommended this subcomponent be defined within each assessment area as no absolute specification should be dictated at the individual or institutional levels.

d. *Describe students to be assessed* – students being assessed in this study were in bachelor programs. This subcomponent would be defined within each academic program to meet institutional or accreditation standards. This subcomponent could be easily adapted to the fire service by defining each member to be assessed. How and on what a person is assessed is described next.

2) *Clarify performance to be evaluated* – the specific performance assessed in this study was based on a competency. Ultimately, performances to be evaluated are defined individually in each fire department and academic program. The performance assessment should relate to at least one competency, but should include more than one competency to meet the criteria of an authentic assessment and be related to real world situations.

a. *Specify, in general terms, the content or skill focus of the assessment* – the ten competencies from phase two are the primary targets of assessment in this subcomponent. It is recognized that the ten competencies identified in phase two may not be pertinent to a specific academic program or fire department.

b. *Select the type of performance to be evaluated* – the type of performance was based on job functions or student achievement. Beyond this study, this subcomponent will be defined within each fire department and academic program.

c. *List performance criteria* – this is the most critical step in the assessment framework. The rating of each competency is based on a continuum of achievement, where each rating is a range of acceptability. For this study, there are four ratings possible – mastery, developing, novice, and deficient. A rating of mastery denotes the performance addressed all the criteria in a comprehensive manner, which is indicative of a well-developed administrative fire officer. A mastery rating would signify the student has a thorough grasp of the defined competency. A rating of developing denotes the performance was mixed, which is indicative of a still developing administrative fire officer. A developing rating would signify the fire officer or student has a partial grasp of the defined competency; some at the mastery level and some below. A rating of novice denotes the performance addressed the criteria in a simplistic manner, which is indicative of a novice administrative fire officer. A

novice rating would signify the fire officer student is just beginning to grasp the competencies and that significant growth is still needed. A rating of deficient denotes the performance did not adequately address the competencies in a manner that would signify the fire officer student has not reached the knowledge, skill, or ability expectation of an administrative fire officer.

3) *Design exercises* – an example was provided for each competency. Beyond this study, this component will be defined within each fire department and academic program.
    a. *Select form of exercises* – a variety of exercises were permitted in this study as long as the competency was assessed.
    b. *Determine the obtrusiveness of assessment* – as stated above, there should be little obtrusiveness of the assessment. The use of the assessment is for quality improvement at the individual or institutional level and not directly applied to job evaluations or grades. The focus of the assessment in this study is qualitative, not quantitative.
    c. *Determine the amount of evidence you plan to gather* – the evidence gathered should be from a complex performance. As stated previously, knowing the outcomes and working backwards helps align all parts of the learning and assessment process. The evidence gathered must support the intention of the assessment.

4) *Design performance rating plan* – this step is defined in each competency question in the Qualtrics questionnaire. The rating plan is qualitative in nature and one that promotes an open discussion about positive improvement.
    a. *Determine the type of score needed* – the scoring used in this study is qualitative and based on a holistic rating where an interpretation by the assessor(s) is given for each competency.
    b. *Determine who is to rate performance* – the rater of a fire officer is a member of the department with knowledge of the officer's performance. Faculty will rate the performance of students. This could include any fire department member, academic faculty, adjunct faculty, a panel of subject matter experts, or a combination of these.
    c. *Clarify score recording method* – the instructions for completing the ratings is provided above with detailed definition of each competency level.

Scoring Rubrics

Rubrics provide a means to classify or assess student performances with the use of descriptive criteria (Allen, 2004; Brookhart, 2013). The descriptive criteria should be a reflection of the learning goals and outcomes of the assignment, course, or program. The benefits of using rubrics include: (1) to promote consistency in rating between students and raters, (2) to assign grades, (3) to inform students on performance expectations, and (4) to promote learning (Allen, 2004; Brookhart, 2013; Palomba & Banta, 2013).

The two most common rubrics used in education are analytic and holistic. Analytic rubrics are used when rating a performance with separate criteria is needed (Allen, 2004; Brookhart, 2013; Palomba & Banta, 2013). Analytic rubrics are more time consuming to complete, but do allow for specific criteria to be rated independently of the other criteria. The negative aspect of the analytic rubric is that the whole performance is not judged, only individual parts of the performance. Analytic rubrics serve a very important purpose, but should be considered for what they actually represent.

Holistic rubrics are used when a whole performance impression or judgment is needed and all criteria are considered collectively (Allen, 2004; Brookhart, 2013; Palomba & Banta, 2013). Holistic rubrics are less time consuming to use and provide a more complete representation of a performance. The holistic rubric is the rubric of choice for this study. While the interpretive summary shows great promise and was initially a part of the research design, the data collection process was not successful in capturing this input. It is hoped that the interpretive summary judgment continues to gain momentum for the purpose of reporting the assessment of student learning.

The Guttman Scale Analysis Model

One of the primary considerations of a profession is the ability for practitioners to demonstrate competency to internal and external stakeholders. A natural fit for the redesign of this study was scale analysis and the model of best fit for competency assessment was the Guttman model. A general description of scaling models are they are designed with the basic concept of quantifying qualitative data (Guttman 1944, 1947, 1950) under a unidimensional or multidimensional lens (McIver & Carmines, 1981). A

scale is defined as “universe of attributes” (Guttman, 1944, p. 140) or “the processes and techniques used to validate the existence of a defined property of an object or event and to establish operational indices of the relative magnitudes of the property” (Gordon, 1977, p. 4). Additionally, there are three notable characteristics of scaling models (1) not all attributes or items selected for analysis are scalable; (2) universe and attributes under examination reflect a moment in time and may not be prior to or after a particular point in time; and, (3) perfect scales are rarely achieved (Gordon, 1977; Guttman 1944, 1947, 1950; McIver & Carmines, 1981). Multidimensional scales examine more than a single dimension with a set of attributes (McIver & Carmines, 1981). However, before using multidimensional scaling models, it is recommended that unidimensional scales be used to provide an understanding of a universe in a simple to understand manner (McIver & Carmines, 1981). Since no unidimensional scaling model of the fire officer *universe* exists, this study sets a foundation for such exploration.

The unidimensional scaling technique promotes the analysis of a data set to a single dimension; while the multidimensional scaling technique promotes the analysis of more than a single dimension under consideration. The design of the questionnaire in this study follows the unidimensional scaling technique because a single overall perspective of a student is sought. In future studies, including a multidimensional scaling technique could be beneficial in exploring the relationship of education, training, and experience to a set of competencies. This complexity of a study would take resources beyond the scope of a dissertation and most likely require a team of researchers to achieve. With no previous studies exploring the unidimensional scaling of competencies, it is necessary to set this foundation for future studies. The unidimensional scaling technique is a

necessary first step before undertaking a multidimensional scaling analysis (Gordon, 1977, p. 25-30).

The Guttman Scale Analysis models are unidimensional in that a single dimension, called a *universe*, of individuals or stimuli are related to a set of qualitative items called *attributes* (Gordon, 1977; Guttman, 1944, 1947, 1950; McIver & Carmines, 1981). "A universe is usually a large class of behavior…" and "…the attributes that define the concept" of the universe (Guttman, 1944, p. 141). The universe is defined as the fire officer performance through the assessment of ten competencies (the attributes). The Guttman model has been used by the military in evaluating morale and other issues (Guttman, 1950, p. 61) and with competency measurement of job performance and enlistment standards (Green & Wigdor, 1991). It is this second study of competency measurement that is the closest comparison to this study.

A comparison of models was conducted with commonly used models of unidimensional and multidimensional analysis prior to selecting a unidimensional design. These models include the Likert, Guttman, Thurstone, Rasch, and Mokken Scales. The Thurstone, Rasch, and Mokken Models are based on statistical measurement theory and quantitatively driven. These models did not fit the qualitative data by quantification analysis as explained by Guttman. The Likert and Guttman Scales were further compared and both had strengths and weaknesses.

The purpose of using scaling models is "simply describing a data structure, that is, for discovering the latent dimensions underlying a set of obtained observations" (McIver & Carmines, 1981, p. 8). This purpose, or approach, does not test a hypothesis – it explores

something (McIver & Carmines, 1981, p. 8). Selecting one model over another has been varied, but there is typically a model that fits better for data analysis (McIver & Carmines, 1981). With the questionnaire asking participants to assess people (not stimuli) by a "degree of agreement or disagreement" the Guttman scale is the model of choice (McIver & Carmines, 1981, p. 9).

There are four assumptions of using the Guttman scaling model. First, a ranking of statements cannot be done beforehand, it must be done by the respondents during data collection. Second, the selection of items under consideration by respondents must be defined beforehand from a third-party group. These two items were done during phase two with the focus group. Third, there is not a prescribed number of items that must be under consideration, but a common range is five to twenty-five. The focus group came to a consensus on ten items. Fourth, a perfect Guttman scale in reality is never obtained. Acceptable errors are common but should be limited to about ten to fifteen percent (Guttman, 1944, 1947). A critical point of the Cornell technique in this step is that

> the universe is said to be scalable for the population if it is possible to rank the people from high to low in such a fashion that from a person's rank alone we can reproduce his response to each of the items in a simple fashion. (Guttman, 1947, p. 249)

Guttman Scale Analysis: The Cornell Technique

A Guttman Scale Analysis model called the Cornell technique was developed during World War II for the United States Army (Guttman, 1944, 1947). It was first developed at Cornell University for education and is an accepted version of the original Guttman Scale Analysis model as a simpler analysis technique that does not require least squares calculations from the original model (Guttman, 1947). This technique is a viable option

for quantification of a ranking order from qualitative data. Outlined next are the five steps for carrying out the Guttman Cornell technique.

Step one: Define the universe.

The first step is to define the universe to be studied. The universe is centered around questions about administrative fire officer performance. An administrative fire officer can take on a variety of ranks, experience, duties, and education. Understanding the unidimensional universe of an administrative fire officer in a scale analysis is of primary consideration and needed prior to understanding the multidimensional aspects of this universe. The multidimensional aspects may include consideration of experience, years of service, size of department, and training, to name a few.

Step two: Define the population.

The second step is to define the population. For the purpose of this study, the population, or unit of analysis is at the individual level. This is a recognized level of analysis in accreditation (Council for Higher Education Accreditation, 2008) and includes students as a common population analyzed in this manner (Babbie, 2017, p. 100). The analysis of individuals will be conducted indirectly with no identifying characteristics obtained. The position of this researcher is to focus on the achievement of competencies through assessments of students in a bachelor degree program and fire officers with a bachelor degree. These assessments will be done confidentially by instructors or fellow fire service members. There is no communication or interaction between the assessors and those being assessed. Additionally, no identifying characteristic, program grades, or other participant information will be gathered as protected by the Family Educational

Rights and Privacy Act (FERPA), 20 U.S.C. § 1232g; 34 CFR Part 99 and Institutional Review Board (IRB) ethical considerations. This protection is extended to all participants during this study.

Steps three and four: Sampling of people and content.

The third step is to identify the sampling and any issues associated with the sampling process. Sampling of both populations was a significant challenge in this study. The population sampled in each phase follows the nonprobability purposive sampling guided by Babbie (2017, p. 196) and Creswell (2013, p. 156). This type of sampling capitalizes on the subject matter knowledge of the participants in developing competency-based assessment tools (Babbie, 2017, p. 196; Creswell, 2013, p. 156). The researcher of this study is using each participant's expertise based on a set minimum criteria for participation (Babbie, 2017, p. 196). An additional consideration of sampling using the Cornell technique is that of pre-test versus final questionnaire of a population. This study is defined as a pre-test to determine the scalability of the data for this population only. This pre-test phase fits well with the overall research design of the Cornell technique in scale analysis in that approximately 100 participants are deemed sufficient and a dozen questions adequately represents the content (Guttman, 1947, p. 249). The final questionnaire of some 3,000 participants (Guttman, 1947) should be undertaken in the future when a team of researchers can be assembled with the resources needed to achieve a multidimensional analysis of this universe.

The sampling process also includes theoretical sampling (Babbie, 2017), opportunistic sampling (Creswell, 2013) and snowball sampling (Babbie, 2017; Creswell, 2013). The

theoretical or opportunistic sampling is an appropriate categorization of the modification in the study to expand the population sampled. The snowball sampling was achieved through the requests for participation, especially from fire department chiefs or representatives. This sampling method was included as a way to gain in increased number of questionnaire respondents by word-of-mouth or forwarding of electronic mail communications. Requests for voluntary participation was achieved by (1) sending letters to academic program administrators, (2) sending a formal request for participation through major state, national, and international fire service organizations, (3) attending meetings and presenting the approved IRB letter, (4) advertising through a major online fire service news organization, and (6) requesting participation through known fire service members of the researcher. These requests resulted in a total of 142 responses between academic programs and fire service personnel.

Privacy is a paramount consideration in this study. The privacy of participation and the protection of individuals complies with legal mandates (such as FERPA), ethical practices, and IRB criteria. Therefore, the computer tracking of internet protocol (IP) addresses of participants was disabled in Qualtrics. Additionally, no identification was gathered from either academic programs or fire departments. It is not known by the researcher who participated in the questionnaire. The researcher maintained a non-participant position during the data collection process.

For academic programs, the assessment of student learning was conducted by program administrators or faculty affiliated with an individual student. For fire departments, the assessment of fire officer competencies was conducted by other fire department members who have specific knowledge of the performance of a fellow member. The fire

department member doing the assessment was not required to have any educational background. The determination of qualification was made by the assessor, not the researcher. A margin of error is expected in this process as the accreditation status of a university or the name of the university where the bachelor's degree was achieved may not be known. It will also be shown that a margin of error is present with regards to the educational achievement of the fire officer being assessed. These margins of error are not considered a critical element of the study.

Step five: Questionnaire completion.

The fifth step in the Cornell technique is the completion of the questionnaire to determine scalability. While Guttman (1947) states this is a testing of the hypothesis – it should be recognized that Guttman is referring to the scalability of the universe, not the hypothesis of the study. First, the questionnaire is to be completed by volunteers who agree to participate and provide input. Next, scalability is determined. This is a simple 13 step process, which will be carried out in Chapter V. A general overview of the process is described here.

Knowing that a perfect scale is not possible, 85 percent reproducible is considered scalable data (Guttman, 1944). This percent is represented by a *coefficient of reproducibility* that is commonly referred to as an *error of reproducibility* (Guttman 1944). This determination of error is based on the scale score achieved by each individual when each column of data is totaled. The process of determining error of reproducibility will be detailed in Chapter V. An additional consideration in this process is that scalability can be found with two estimations of the data (Guttman, 1947) – that is

two columns of data narrows from the original five. First, the estimation is a straightforward ranking of individuals based on the weights of each response in the five columns. Very simply, each response is rated 0, 1, 2, 3, or 4. A zero weight is assigned if the answer was not applicable or not answered. A weight of one is given if the response was deficient, two for novice, three for developing, and four for mastery. After assigned a weighted score to each attribute in the universe, an overall score, or ranking is calculated for each individual. The ordering of individuals with the same ranking is not a critical arrangement (Guttman, 1947). Two or more persons with the same overall score can be ordered with the higher scores first, as reading from left to right. The researcher has some flexibility here to order the same scores in a manner that reduces the error of reproducibility. A visual inspection of the ranking order can be a good indication if scalability is possible with this grouping arrangement and with the overall rank order.

Combining weighted scores is necessary when the first estimation does not produce a scale (Guttman, 1947). This will be a trial-and-error process that can take several attempts, which is common and needed in this study. During this process, competency ratings may be put into two or three combined categories (i.e., mastery is combined with developing and novice) and a reordering of individuals based on this is done. *Cutting points* are used in this process to minimize error (Guttman, 1947) and evaluate the error of reproducibility. It will become visually apparent when scalability is possible because some item response categories will have "a uniform distribution of frequencies" (Guttman, 1947, p. 261). For example, all scores with a two assigned should be higher followed by any one weighted scores, then zero. This vertical alignment, or ordering, is how a scale is determined. Uniformity of this alignment is not required as some "non-

uniform frequencies are also needed in order to get differentiated scale types" (Guttman, 1947, p. 261). The differentiation of scores is the error of reproducibility. An advantage of using this scale analysis is that once a universe is deemed scalable, any further questions about the universe will be scalable (Guttman 1947).

Central Research Question and Subquestions

In exploring the relationship between the professionalization process and competencies in the fire service, this study focused on one central research question and five subquestions. This follows the recommendation of Creswell (2013, p. 138) for qualitative studies to develop one "overarching central question." The central question of this study is:

> *What fire officer competencies are relevant to the United States fire service?*

In addition to this central question, five subquestions are presented and examined in this study. Subquestions allow a researcher to break the research questions down into small elements for consideration (Creswell, 2013, pp. 140-141). The five subquestions of this study are:

1) *What benefit is there for conducting fire officer competency assessment in academic programs or the United States fire service?*
2) *Where are fire officer competencies best learned?*
3) *What consistency in curriculum exists across regionally accredited fire-related baccalaureate degree programs in the United States?*
4) *What framework of professional development exists in the fire service?*
5) *Does the United States fire service meet the criteria of a profession?*

Data Collection and Analysis

The scope of data collection in this study is limited to the Fire Officer III or Administrative Fire Officer (AFO) level (illustrated in Chapter II) competencies. The overall data collection process uses a construct-centered approach. The constructs in this approach are the knowledge, skill, and ability (KSAs) valued in society, but also guide the interpretation of assessment (Messick, 1994). Defining the KSAs of AFOs, started in phase one through the triangulation of three separate fire service documents into a collective list of competencies. The documents are products of fire service organizations – CSPE, IAFC, and NFPA – that are broadly considered to be the leaders in defining performance expectations. Phase one produced a comprehensive list of 95 competences spanning these organizations' documents. The scope of this list was limited to existing recognized competencies, no new competencies were added to this list. Next, the validation process of phase two focused on identifying the competencies of AFOs *best learned in education*. To accomplish this validation process, it was necessary to convene a focus group of fire service subject matter experts from across the United States in one location. The outcome of this focus group was a consensus on a list of ten core competencies, which are the basis of the phase three assessment. This construct-centered approach is especially beneficial in authentic assessment of complex performances (Messick, 1994). The authentic assessment in phase three allows for flexibility in the academic freedom of educational programs and that of each fire department. It is anticipated that differences will exist on expected competency importance to each. These differences are presented in the results of Chapter V. All this is done while formulating a construct-centered assessment of the ten core competencies defined by the focus group.

Each phase discussed above will have a varying degree of complexity of data analysis. First, in phase one, the data analysis is simplistic with a process of triangulation of data obtained from three sources. Each competency from the CPSE, IAFC, and NFPA represents current practice expectations in the fire service at the administrative fire officer level; therefore, no modification of competencies will be conducted. Each set of competencies was clearly identified with ownership and kept separate. This unobtrusive method provided a compilation of data, which is further considered in phase two.

Second, phase two was more complex than phase one with several independent parts. IRB approval was needed due to the nature of involving people in the process. Approval was also needed by Fire Protection Publications, the International Fire Service Training Association (IFSTA), and the International Fire Service Journal of Leadership and Management (IFSJLM) in order for the focus group to convene. This approval included communication with potential participants and use of a room at the conference site for the focus group. The focus group meeting was convened to validate the compilation of competencies into a final core list. Each list of competencies rated by each focus group member is presented in Tables 1, 2, and 3 below. This summarization occurred via electronic mail prior to the focus group in-person meeting. The summarization including ratings of Education-High, -Medium, -Low, Training, or Experience on where a competency is best learned. With a summary list of competency ratings, the focus group deliberated on coming up with a final list of core competencies. The focus group was successful in coming to a consensus on ten core competencies. These core competencies are the basis for the development of the assessment of student and fire officer performance.

Third, phase three was the most complex phase in the data collection process. The development and use of the assessment tool. Here, careful consideration needed to be given to the description of each rating. It is presumed that the ratings exist on a continuum and that each rating represents a range along this scale. The development of each assessment needed to balance the general scope of the competency, yet provide enough criteria for a valid and reliable rating to be assigned. The absolute performance is not defined, as this must be the prerogative of each academic program or fire department. It is this point of individual variance of rating that is considered with the reliability of this study.

To ensure consistency, the scope of academic program inclusion is limited to regionally accredited academic programs. An IRB approved recruitment letter was sent to program administrators. These letters outlined the study and invitation to voluntarily participate in this study. There is no reporting to any regional accreditor or institution with any acceptance or denial of participation. The programs remain anonymous and are not known to the researcher. Regionally accredited programs have met identical criteria for accreditation, thus are considered peer-programs where transferability of credits is widely accepted. The program administrator identifies assessors from their faculty list. The assessors from each program will assess complex performances, written assignments, or other forms of performance from a portfolio, capstone course, or course assessment.

For fire departments, an equal accreditation standard was not stipulated. Fire officers were asked to have a bachelor degree from a regionally accredited college, but this was not completely met and is not considered to negatively impact the study. It is an accurate representation of the fire service population.

Different models of analysis were considered in the data analysis. These models include the Likert, Guttman, Thurstone, Rasch, and Mokken Scales. The Thurstone, Rasch, and Mokken Models are based on statistical measurement theory and quantitatively driven. These models did not fit the qualitative data by quantification analysis as explained by Guttman (1944, 1947). The Likert and Guttman Scales were further compared and both had strengths and weaknesses. In the end, the Guttman Scale Cornell technique provided the best scale analysis for this study.

One of the purposes of using scaling models defined by McIver and Carmines (1981, p. 8), is "simply describing a data structure, that is, for discovering the latent dimensions underlying a set of obtained observations." This purpose, or approach, does not test a hypothesis – it explores something (McIver & Carmines, 1981, p. 8). Selecting one model over another has been varied, but there is typically a model that fits better for data analysis (McIver & Carmines, 1981). With the questionnaire asking participants to assess people (not stimuli) by a "degree of agreement or disagreement" the Guttman scale is the model of choice (McIver & Carmines, 1981).

Another characteristic of scaling models described by McIver and Carmines (1981, p. 13) and Gordon (1977, p. 28) is a unidimensional versus a multidimensional approach to data analysis. The unidimensional scaling technique promotes the analysis of a data set to a single dimension; while the multidimensional scaling technique promotes the analysis of more than a single dimension under consideration. The design of the questionnaire in this study follows the unidimensional scaling technique because a single overall perspective is sought. In future studies, including a multidimensional scaling technique could be beneficial in exploring the relationship of education, training, and experience to

a set of competencies. This complexity of a study would take resources beyond the scope of a dissertation and most likely require a team of researchers to achieve. With no previous studies exploring the unidimensional scaling of competencies, it is necessary to set this foundation for future studies. The unidimensional scaling technique is a necessary first step before undertaking a multidimensional scaling analysis (Gordon, 1977, p. 25-30).

Validity

Validity has been characterized as a dynamic, ever changing process that is not ever complete (Messick, 1993). For the purpose of this study, validation is an inductive interpretation of student and fire officer performance that should include multiple points of evidence (Messick, 1993; Moss 2003). It is the assumption of this researcher that true validity is strived for in assessment but has no absolute end. Validity in this sense is an interpretation of performance guided by assessment (Moss, 2003), or as indirect evidence by interpretation of competency (Epstein & Hundert, 2002; Trinder, 2008). Although this study is qualitative in nature, some level of categorization or rating is needed to understand the degree of accomplishment of each student, or "degrees of competency" (Green & Wigdor, 1991, p. 2). Striving for validity, one makes "the most reasonable case" of an evaluation procedure (Messick, 1993, p. 13) so consistent interpretation is likely.

The historical definitions of validity include four common types – face, criterion-related, construct, and content. The traditional definition of validity is being as precise on measurement as possible (American Psychological Association, 1954, p. 13; Babbie,

2017, p. 152; Moskal & Leydens, 2000, p. 1). The results then are described as trustworthy, authentic, and credible (Creswell & Creswell, 2018, p. 200), or as Leedy and Ormrod (2016, p. 96) state, it "is the extent to which the instrument measures what it is intended to measure." Validity theory has traditionally been associated with psychometrics, but is now being associated with hermeneutics where a holistic view of complete performances comes from a multitude of evidence (Moss, 2003). From this view, a greater understanding of the whole student achievement or fire officer performance can be accomplished. While it is accepted that complex performances are challenging to judge, "…direct assessment of performance appear to have the potential of enhancing validity" (Linn, Baker, & Dunbar, 1991, p. 16).

The first type of validity addressed is face validity (Babbie, 2017; Leedy & Ormrod, 2016), which in this study is the appearance of an assessment procedure to reasonably measure competency of students or fire officers. Face validity is addressed by use of a model framework in which to conduct the data collection phases of the project. The subjective opinion of testers of the assessment procedure will be categorized as rating a competency as mastery, developing, novice, deficient, or not applicable. This subjective assessment creates a first impression of the usability of the assessment procedure and is aligned with the usage recommendation from Babbie (2017) and Leedy and Ormrod (2016). Face validity is not consistently used in research and is not considered a "dependable indicator" (Leedy & Ormrod, 2016, p. 97). Even though face validity may not be a good indicator in a research sense, it is important to be able to present a case for acceptance based on appearance. The following three types of validity are consistently

used and “are commonly examined to support the validity of an assessment instrument…” (Moskal & Leydens, 2000, p. 1) such as assessment procedures.

The second type of validity addressed is criterion-related validity, and may be called predictive validity (American Psychological Association, 1954; Babbie, 2017, p. 153), or criterion validity (Leedy & Ormrod, 2016, p. 97). This type of validity compares some external measurement of the future to the initial measurement (Moskal & Leydens, 2000). In this study, this type of validity will not be included. It is recommended that a future study examine the results of this study with competency of fire service members with comparable education and certification. This internal to external comparison could provide valuable insight into the appropriateness of the defined competencies and whether revisions need to be made based on the dynamic nature of emergency response.

The third type of validity addressed is construct validity. It is not a definitive measurement, but does provide a possible measure of a characteristic of a test taker (American Psychological Association, 1954, p. 14; Babbie, 2017, p. 153; Leedy & Ormrod, 2016, p. 97; Moskal & Leydens, 2000, p. 2). In this study, the construct of an assessment tool needs to include determining the knowledge, skills, and abilities of students as they relate to real-world complexities (Messick, 1995a). Score interpretation provides the evidence of construct validity (Messick, 1995b). The interpretations will also depend on the available competency assignment collected by participant programs or fire departments. For example, an assignment may allow for measurement of critical thinking, or “an individual’s reasoning process” (Moskal & Leydens, 2000, p. 2) as a part of scenario-based essay. It is assumed in this study that not all fire-related education programs assess the same dimensions.

The fourth type of validity addressed is content validity (American Psychological Association, 1954; Babbie, 2017; Leedy & Ormrod, 2016) which in this study is the assessment of achievement of a competency. Content validity is the most critical to this study as it "is especially important in the case of achievement and proficiency measures" (American Psychological Association, 1954, p. 13), and "reflects that student's knowledge of the content area that is of interest" (Moskal & Leydens, 2000, p. 1). The nature of assessment of complex performances will be comprehensive and repetitive in this study.

To expand on the validity consideration, one example of a proposed framework of criteria of validity by Linn, Baker, and Dunbar (1991) is specific to assessment of complex performances. This study will incorporate the criteria in this framework and the traditional elements of validity, as there are common points between them. The criteria of this framework include consequences, fairness, transfer and generalizability, cognitive complexity, content quality, content coverage, meaningfulness, and cost and efficiency. These criteria meet the expectation of validity and those associated with the newer complex performance assessment movement and is proposed by Linn, Baker, and Dunbar (1991, p. 16) in the following summary:

- Consequences – a collection of evidence on learning can have intended and unintended consequences for assessment. It is stated that directness and transparency have a positive influence on the consequences criterion by maximizing intended effects and minimizing negative ones.

- Fairness – concerns of equity between students where biasness is reduced or eliminated. Here the performance must be the true rating, not the biases of the assessor.
- Transfer and generalizability – a focus on aligning performance tasks to assessment criteria is critical, especially with transferability. Student knowledge should be shown to transfer from one assessment point to another.
- Cognitive complexity – assessments meeting this criterion use levels of cognition to complete. Questions in performances should be more open-ended, not standardized multiple-choice.
- Content quality – quality should exemplify current standards of practice in the field. Involving subject matter experts to help define tasks and the assessment is crucial.
- Content coverage – this criterion aligns content of subject material to assessment.
- Meaningfulness – here problems highlighted in education should be pertinent to the learning expectation during assessment.
- Cost and efficiency – the cost and efficiency of the assessment process must be practical.

Messick (1995b) provides two major threats to validity in assessment – construct underrepresentation and construct-irrelevant variance. Both threats to validity are addressed in this study through the work in phases one and two of the data collection process. Using established criteria of knowledge, skills and abilities of fire officers from renowned fire service organizations strengthens the dimension assessment.

Reliability

This section will address the three forms of reliability as they relate to this study. The researcher of this study has adopted the traditional definition of reliability as being a consistency in measure (Babbie, 2017; Leedy & Ormrod, 2016), specifically with "consistency of assessment scores" (Moskal & Leydens, 2000, p. 4). The test-retest, equivalent forms, internal consistency, and rational equivalence forms of reliability are commonly addressed in a statistically based research study (Moskal & Leydens, 2000, p. 4). These forms of reliability may be seen "on standardized or high stakes testing" (Moskal & Leydens, 2000, p. 4), but are not relevant here.

Two forms of reliability that are relevant in this study are interrater and intrarater. Interrater reliability is the consistency of assessment between two or more raters using the same measurement tool (Leedy & Ormrod, 2016, p. 99; Moskal & Leydens, 2000, p. 4). Intra-rater reliability in concerned with situations where a single rater has differences in rating based on situational influences like emotion, physical fatigue, time of the evaluation (first versus last) to name a few (Moskal & Leydens, 2000).

The researcher of this study has taken steps to reduce interrater errors or inconsistencies to manage these concerns. First, the assessment procedure will be refined and vetted by fire service experts as described. The competencies assessed are preexisting and considered accepted practice in today's fire service. Programmatic specific learning outcomes are not measured intentionally within this study. Second, raters are provided with definitions for use in the questionnaire prior to use. Third, raters of students should be limited by the program administrator in which they have instructional responsibility;

and, fire department raters should be limited to other members within their department. Some degree of variability is expected with this interrater consistency, but it is not a strict rule or limitation.

The Guttman Scale Analysis Model specifically addresses the test-retest reliability concern. The coefficient of reproducibility is a representation of the amount of error present from a perfect scale (Gordon, 1977; Guttman, 1944). The acceptable amount of error has been presented at either 85 or 90 percent (Guttman 1944, 1947). For this study, the 85 percent acceptable error measurement is used. This error measurement is included in the steps above and will be presented in the results chapter.

Limitations

This study is limited to the competencies stated in NFPA 1021, the IAFC Officer Development Handbook, and the CPSE Chief Fire Officer designation. No additional competencies are defined or attempted to be defined. It is assumed these competencies reflect the performance expectation of students in a baccalaureate fire-related degree program or those currently serving at the Fire Officer III (NFPA) or the AFO (IAFC) level. It is additionally expected this level of performance meets the criteria of the Chief Fire Officer (CPSE) designation.

The sample of students is limited to academic programs accredited by a regional entity. Generalizing information about the student population is not assumed or prescribed. Similarly, the sample of fire officers includes a mix of those with a bachelor degree and those without. Furthermore, a delineation of fire officers serving in career, combination, or volunteer fire departments is not made. Further studies in this area could identify

competencies that are specific to each fire department type. Generalizing information about the academic programs or fire departments is also not assumed or prescribed. The voluntary participation of respondents is requested solely as a means to conduct data collection and analysis of the assessment process.

One assessment procedure will not capture all the stated competencies of fire officers in baccalaureate education programs or in the fire service. With ten competencies listed from the focus group, assessment of student and fire officer performance may well occur over time. The assessment of performance conducted in this study are bound in time and not generalizable beyond this study. The assessment procedure designed in this study includes a qualitative assessment tool.

Delimitations

This study does not assess all criteria or descriptions of a profession. Literature on the professions is extensive and covers a multitude of avenues that are not pertinent to this study. Therefore, the literature presented on professions and professionals is limited to those sources that provide a historical perspective and that contextualize the topic. One criterion, education, was isolated for detailed examination as it relates to the assessment of competencies of undergraduate students at the Fire Officer III level. The remaining criteria are only covered in enough detail to assist the reader in understanding the scope of the topic.

This study does not assess the quality of the academic programs or fire departments participating in this study or the actual competency of individuals. Additionally, no correlation should be made between the assessment conducted in this study and fire

department performance evaluations. No assumption of comparison should be made between the assessment in an educational setting and certification testing from a professional association that regulates admission to practice in a profession. Additionally, there is no comparison between students, grades, and academic programs.

This study does not proclaim any best practice design of curriculum for educational programs. The design of curriculum is left to the determination of each academic program as they comply with state and institutional guidelines and policies.

Summary

Qualitative research methodology provided the best approach to explore the universe of fire officer performance and the attributes of this universe. The Guttman Scale Analysis Model allows for the quantification of qualitative data and complements the assessment theory approach. Steps for using the Cornell technique version of the Guttman Model are straightforward with many steps done simultaneously. The scalability of the universe provides insight into answering how well a person can perform in a job position with each attribute and how much of this job is performed well. With this foundation, further studies can expand the understanding of what attributes (i.e., competencies) might be considered and assessed. Using the framework of the Guttman Scale Analysis Model can promote further exploration of the ability to scale competencies and simplify the assessment process.

CHAPTER IV

UNOBTRUSIVE MEASURES AND FOCUS GROUP

A method of data collection in qualitative research includes the use of unobtrusive measures, which may be called "unobtrusive data" (Hatch, 2002, p. 117). Unobtrusive data collection includes the use of documents (Hatch, 2002, p. 117), which in this phase is an examination of three prominent fire service documents. To be unobtrusive, these documents needed to be "nonreactive" and "without disturbing the natural flow of human activity" (Hatch, 2002, p. 118). With both of these conditions met, the documents were evaluated for specific content related to this research project. It should not be assumed that these documents are all encompassing of what fire officer competencies should be, but they do provide a recognized and accepted list from which a fire officer competency list and assessment should begin. Some fire departments and members look to these documents (listed below) for guidance on professional development.

The construct-centered approach of this study required that competencies of fire officers be identified. To compile a general list of competencies, the following documents were evaluated:

1) Center for Public Safety Excellence (CPSE) *Chief Fire Officer Designation* (CFOD), Version 6.
2) International Association of Fire Chiefs (IAFC) *Officer Development Handbook* (ODH), 2nd edition, 2010.

3) National Fire Protection Association (NFPA) 1021: *Standard for Fire Officer Professional Qualifications,* 2014 edition.

The CPSE, IAFC, and NFPA are distinguished leaders in the fire service. The documents produced by these organizations have some common elements but are not uniform. It appears each entity approaches the competency development process from a different perspective. It is this variation that provides the opportunity for a focus group to identify and rate a variety of core fire officer competencies in a comprehensive manner.

The structured focus group process followed in this study were established guidelines and framework outlined by Babbie (2017), Stake (1995), Vaughn, Schumm, & Sinagub (1996), and Yin (2014). The design of the focus group can be described as a qualitative group interview (Babbie, 2017, pp. 321-322) used to validate a list of fire officer competencies. Prior to conducting any part of the focus group, Institutional Review Board (IRB) approval was obtained specific to this phase of the research.

Potential focus group participants were identified from a known gathering of fire service experts and by personal knowledge of the researcher. IRB approved invitational letters were sent out via electronic mail to a list of conference attendees and to personal contacts. Volunteers meeting the minimum criteria for participation were formally invited to participate in the focus group. The focus group size ultimately met the guideline of being between five and fifteen persons (Babbie, 2017, p. 321). The participants of this focus group included a diverse group of fire service subject matter experts (SMEs) from around the United States. This diverse group brought a variety of backgrounds and specialties to the process and conforms to the relevance of the subject

matter to deliberate on the competency lists (Babbie, 2017, p. 322; Vaughn, Schumm, & Sinagub, 1996). To qualify for participation in this study, an individual had to volunteer their time and meet the following attributes:

1) Earned a fire-related bachelor's degree from a regionally accredited university.
2) Accumulated a minimum of ten years of experience in the fire service.
3) Experience as an educator either at the college or university level or in the development of educational materials, or both.

Creating a research study such as this requires input and guidance from fire service experts. The researcher took a nonparticipant observational role in that rating of competencies are those of the experts, not the researcher. Using a focus group process is a best practice of research. The focus group was successful in coming to a consensus on fire officer competencies best learned in the educational setting. This conclusion does not diminish the remaining competencies; it solely provides a starting point for the development of an assessment process. The goal of these stages of exploration is to elicit a progressive understanding of the status of competency assessment and how it can relate to the professionalization process in the fire service.

From the collection of documents and information in the initial data collection, the focus group process was designed with two elements – a pre-meeting assignment and an in-person meeting. The pre-meeting assignment was conducted electronically, with the purpose of rating fire officer competencies. The fire officer competencies were broken down into a worksheet outlining the knowledge, skills, and abilities (or experiences) identified from the unobtrusive measures. Volunteer participants rated each item by where they best felt a knowledge, skill, or ability was *best learned* by a fire officer. The

focus group was given a rating scale of Education-High, Education-Medium, Education-Low, Training, or Experience in which each competency was assessed. For example, an Education-High rating meant that a competency was *best learned* in that setting and was a critical competency for an administrative fire officer as a student in a bachelor degree (or as extended later in the study to include all fire officers with a bachelor's degree). A rating of Education-Medium or Education-Low are those competencies that are best learned in education, but not a core course in the curriculum. These may instead fall into elective or general education courses, or be a lesson in a course. The results are presented in Tables 1, 2, and 3 below.

The second element of the focus group was an in-person meeting. The focus group session was held at the conclusion of the 2017 Research Symposium (RS-17) hosted by the International Fire Service Journal of Leadership and Management (IFSJLM) on Saturday, July 8, 2017 in Tulsa, Oklahoma. The focus group in-person meeting location was selected for the collection of SMEs at this symposium and the following International Fire Service Training Association (IFSTA) summer conference. The purpose of selecting the IFSJLM symposium along with the IFSTA conference is the ability to convene a broad audience of fire service experts that are committed to the advancement of training and education of members of the fire service in a central geographical location in the United States. Additionally, focus group members included those relatively close to Tulsa who would have limited travel. Participation was not limited to individuals attending the IFSJLM or IFSTA conference. Personal invitations were sent to known fire service experts within a day's travel to Tulsa, Oklahoma. Permission to conduct this focus group at the conference site was granted by Mike

Wieder, Executive Director of IFSTA and Associate Director of Fire Protection Publications (FPP) and Dr. Robert England, Founding Editor of IFSJLM. The meeting approval was documented in the IRB application. While the focus group was held at the symposium and conference site, there is no endorsement by IFSTA, FPP, and IFSJLM or its affiliates to this research study. The disclaimer of this study is that is does not represent the views or positions of IFSTA, FPP, or IFSJLM. The participants are doing so voluntarily and outside of any meeting, function, or operation of IFSTA, FPP, or IFSJLM. All materials and information presented in this dissertation remain solely the responsibility and accountability of the researcher.

During this meeting, the focus group reviewed the summary worksheet and discussed each competency rating. The goal was to come to a consensus and validate which competencies should be assessed at or near the conclusion of an educational program. The structured process first focused on competencies that were rated as Education-Low, Training, and Experience. It was determined that the competencies rated mostly in these categories could be removed from consideration. The reason for this is that the competency is best learned outside of the educational environment. It should be noted that this does not diminish the importance of the competencies; it only reflects where the best learning environment was deemed for these competencies. By narrowing the competencies to the Education-High and Education-Medium, and those with a mixed review that were not removed from consideration, the discussion then be focused on a specific competency list. This final competency list would reflect those items that are determined to be best learned in education and should be specifically assessed in this study.

First, the CPSE identified twenty technical competencies (TCs) for the CFOD. Of the twenty TCs listed, four are for the Executive Fire Officer (EFO) level and eliminated from consideration in the final consensus of core competencies. The TCs removed from consideration are 2, 15, 17, and 19. A summary of the results is presented in Table 1 and followed by a description of each along with the resulting action by consensus.

Table 1

Results of CPSE TCs from the Focus Group

	Education			Training	Experience
	High	Medium	Low		
TC1 Assessment/Planning	8	1	0	2	0
TC3 Organizational Structure	6	2	2	1	0
TC4 Financial Practices	7	1	1	1	1
TC5 Administrative Support	3	1	0	6	1
TC6 External Agency Relationships	1	2	3	5	0
TC7 Administrative Policies	8	2	0	1	0
TC8 Hiring/Promotional Practices	7	2	0	2	0
TC9 Employee Relations	8	1	1	1	0
TC10 Health/Risk Management	3	4	0	4	0
TC11 Life Safety	2	2	1	6	0
TC12 Investigation and Reporting	2	2	0	7	0
TC13 Public Education/Relations	1	4	1	5	0
TC14 Training	1	2	0	8	0
TC16 Special Operations	2	4	0	4	1
TC18 Communications	0	2	1	6	2
TC20 Physical Resources	1	2	0	8	0
Total	60	34	10	67	5

- *TC1 Assessment and Planning* – covers strategic planning and associated elements of community demographics and characteristics. The consensus was to accept strategic planning within the administrative competency.
- *TC3 Organizational Structure* – covers the legal environment in fire administration. The consensus was to accept the legal environment within a political/legal competency.

- *TC4 Financial Practices* – covers the general application of budgeting practices, resources management, and capital improvement plans. The consensus was to accept a budgeting competency.
- *TC5 Administrative Support* – covers general office functions and records management system. The consensus was to remove general office functions from further consideration as it is best learned in the training environment.
- *TC6 External Agency Relationships* – covers obligations and mutual aid plans. The consensus was to remove general office functions from further consideration as it is best learned in the training environment.
- *TC7 Administrative Policies* – covers the principles of human resource management. The consensus was to accept human resource management as a competency.
- *TC8 Hiring and Promotional Practices* – covers human resource management principles associated with hiring and promoting fire service members. The consensus was to accept human resource management as a competency.
- *TC9 Employee Relations* – covers human resource management principles associated with personnel management. The consensus was to accept human resource management as a competency.
- *TC10 Health and Risk Management* – covers the occupational safety and health of members. The consensus was to remove occupational safety and health from further consideration as it is best learned in the training environment.

- *TC11 Life Safety* – covers the fire prevention life safety aspects of building codes. The consensus was to remove life safety codes from further consideration as it is best learned in the training environment.
- *TC12 Investigation and Reporting* – covers the legal aspects of fire prevention. The consensus was to remove the legal aspects of fire prevention from further consideration as it is best learned in the training environment.
- *TC13 Public Education and Community Relations* – covers the planning process and presentation of public education. The consensus was to remove the fire prevention public education from further consideration as it is best learned in the training environment.
- *TC14 Training* - covers the management of a training program. The consensus was to remove the training from further consideration as it is best learned in the training environment.
- *TC16 Special Operations* - covers the management of a special operations unit. The consensus was to remove management of special operations from further consideration as it is best learned in the training environment.
- *TC18 Communications* - covers the management of a communications center. The consensus was to remove the management of the communications center from further consideration as it is best learned in the training environment.
- *TC20 Physical Resources* - covers the management of facilities and department resources. The consensus was to remove the management of facilities and resources from further consideration as it is best learned in training.

Second, the IAFC ODH lists twelve administrative fire officer (AFO) educational competencies. All of the competencies are accepted into the final competency list. The results of each AFO competency is as follows:

Table 2

Results of IAFC AFOs from the Focus Group

	Education			Training	Experience
	High	Medium	Low		
AFO-01 Economics	7	3	1	0	0
AFO-02 Management Principles	8	3	0	0	0
AFO-03 Public Management	8	3	0	0	0
AFO-04 Leadership	6	3	2	0	0
AFO-05 Human Resources	8	3	0	0	0
AFO-06 Risk Management	5	5	0	1	0
AFO-07 Administration	5	5	0	1	0
AFO-08 Analytics	7	2	1	1	0
AFO-09 Political/Legal	6	3	1	1	0
AFO-10 Budgeting	6	3	1	1	0
AFO-11 Organizational Behavior	6	3	2	0	0
AFO-12 Ethics	5	2	2	0	0
Total	77	38	10	5	0

Note. AFO = administrative fire officer.

Third, the NFPA 1021 has the most extensive list of competencies. Some competencies are listed multiple times, so it was necessary to combine them into one consideration. As Table 3 depicts, this was a complicated process of data analysis. The focus group was able to work through this comprehensive list by narrowing the consideration to those items that rated significant to the Education-High and Education-Medium categories.

Table 3

Results of NFPA 1021 from the Focus Group

Knowledge/Skill	Education			Training	Experience
	High	Medium	Low		
6.1.1 General with research/data analysis/ communication	6	3	1	1	0
Subtotal	6	3	1	1	0
6.2 Human Resources					
6.2.1 Staffing	1	2	0	3	5
6.2.1 Human Resource	1	4	0	3	3
6.2.1 Policy/Procedure	1	3	1	5	1
6.2.2; 6.2.3 Laws	4	1	1	4	1
6.2.4 Interpersonal	4	2	2	3	0
6.2.5 Benefits	0	2	0	6	3
6.2.6 Policy/Procedure	2	1	1	5	2
6.2.7 Agency mission	1	2	0	4	4
6.2.1; 6.3.1; 6.4.1 Interpersonal Relations	4	0	0	3	4
6.2.2; 6.2.6; 6.3.1; 6.4.1; 6.4.2; 6.4.3; 6.4.4; 6.4.5; 6.4.6; 6.5.1; 6.5.2; 6.6.1; 6.6.2; 6.7.1; 6.8.1 Communication	7	2	0	1	1
6.2.3 Mentoring	1	2	0	4	4
6.2.4 Evaluations	1	2	0	5	3
6.2.5; 6.2.6 Research	8	2	1	0	0
6.2.7 Needs assessment	6	3	0	2	0
6.2.1 Personnel assignments	0	2	0	1	8
6.2.2 HR procedures	3	1	2	4	1
6.2.3 Promotions	3	3	1	3	1
6.2.4 Professional development	3	3	0	3	2
6.2.5 Employee benefits	1	5	1	1	3
6.2.6 Employee accommodation	2	3	2	3	1
6.2.7 Education/ training program	2	1	2	4	2
Subtotal	55	46	14	67	49

6.3 Community/ Government Relations					
6.3.1 Demographics	1	2	1	2	5
6.3.1 Customer service	2	1	0	7	1
6.3.1 Program development	3	2	1	4	1
6.3.1 Risk reduction	2	4	1	3	1
Subtotal	8	9	3	16	8
6.4 Administration					
6.4.1 Supplies and equipment	0	2	0	3	6
6.4.2 Revenue	4	1	0	4	2
6.4.3 Purchasing laws	1	4	0	5	1
6.4.4; 6.4.5 Acquisition principles	4	1	1	3	2
6.4.6 Policy/Procedure	3	2	1	3	2
6.4.1 Allocate finances	4	1	0	3	3
6.4.1 Budgets	3	2	0	2	4
6.4.2 Budget systems	5	1	1	2	2
6.4.3 Request for proposals	1	2	0	3	5
6.4.4 Record management system	1	2	0	3	5
6.4.5 Analyze/interpret records	4	2	0	1	4
6.4.6 Organizational improve plan	2	3	0	1	5
Subtotal	32	23	3	33	41
6.5 Inspection and Investigation					
6.5.1; 6.5.2 Policy and procedure	2	2	0	5	2
6.5.2 Consensus building	1	2	0	5	3
6.5.2; 6.6.1; 6.8.1 Organize plans	0	2	0	2	7
6.5.1 Evaluate inspection program	1	2	2	3	3
6.5.2 Develop a fire safety plan	2	3	2	1	3
Subtotal	6	11	4	16	18

6.6 Emergency Service Delivery					
6.6.1 Policy/procedure	1	3	0	7	0
6.6.2 Post incident analysis	2	2	0	7	0
6.6.3 Needs assessment	3	3	1	3	1
6.6.3 Evaluate external resources and plans	3	0	1	2	5
6.6.1 Multi-agency action plan	1	2	0	6	2
6.6.2 Post incident analysis	1	1	1	5	3
6.6.3 Unmet need plan	3	1	0	2	5
Subtotal	14	12	3	32	16
6.7 Health and Safety					
6.7.1 Policy/Procedure	3	1	1	4	2
6.7.1 Injury prevention program	4	0	0	6	1
Subtotal	7	1	1	10	3
6.8 Emergency Management					
6.8.1 Role of fire service in EM	3	3	2	3	0
6.8.1 Interagency plans and cooperation	1	4	0	3	3
6.8.1 Plan for fire service integration	3	1	2	3	2
Subtotal	7	8	4	9	5
Total	135	113	33	184	140

This list is not itemized here. The focus group assessed the tallies of each and compared the results to the CPSE and IAFC results shown above. After debating each, the focus group was successful in coming to a consensus of a list of ten (10) core competencies. The following ten core competencies are the foundation for the assessment process outlined in this study and include elements from each of three organizations competency lists.

1) *Management Principles and Organizational Behavior* – this competency is guided by the theoretical and practical application of general management principles as it relates to the public sector. Discrete elements in the public sector include industry trends, group dynamics, organizational change, political environment, social factors, and the decision-making process.
2) *Leadership* – this competency is guided by the principles of leadership. Discrete elements of leadership include different styles of leadership and the adaption of them in various situations.
3) *Human Resource Management* – this competency is guided by the principles of human resource management. Discrete elements of human resource management include all aspects of personnel management, labor/management considerations, mentoring, and the legal environment.
4) *Risk Management* – this competency is guided by the principles of risk management. Discrete elements of risk management include an occupational safety and health program, community risk assessment, regulatory mandates, and the reduction of risks.
5) *Advanced Fire Administration* – this competency is guided by the general planning and capability oversight in a fire department. Discrete elements of fire administration include strategic planning, needs assessment, operational capability, and industry trends.
6) *Analytical Approaches* – this competency is guided by the principles of research. The discrete element focuses on analytical research in support of decision-making.

7) *Political and Legal Environment* – this competency is guided by the political and legal environment of the department. The discrete elements focus on the environments of the politics in the jurisdiction and the federal, state, and local legal mandates that influence department operations.
8) *Budgeting* – this competency is guided by the general theoretical and practical application of financial management principles. Discrete elements include applying the general principles to a budgeting system, economics, the legal environment, financial reporting, and resource allocation and acquisition.
9) *Ethics* – this competency is guided by the theoretical foundation of ethics and the practical application of moral decision making. The discrete element focuses on ethical theory and the adaptation of morality in different situations.
10) *Communications* – this competency is guided by the principles of communication. The discrete elements focus on oral and written communications in a variety of situations.

An added consideration during the deliberation process, the focus group emphasized the need for discrete elements to help describe each competency. The discrete elements included above came mainly from the NFPA 1021 standard. The group felt the discrete elements provided clarity as to what could be assessed with each competency. Sample activities were also included for each competency by the researcher. These sample activities provide just one of any number of possible activities in which assessment could occur. They are provided only as a point of reference and not stated as absolute activities that need to be included.

Each competency needed a level of specificity so they can be assessed and rated. However, this also creates challenges in "determining how well the student must perform to be judged to have an adequate command of the material" (Tanner, 2001, p. 10). The issue is with a dichotomous (pass versus fail) determination of "the *degree* of accomplishment" (Tanner, 2001, p. 50) or "the degree of competence" (Glaser, 1963, p. 520; Green & Wigdor, 1991). This degree of accomplishment was a specific concern of the focus group. Basically, how will an assessor know how to grade or judge student competency? The context of this question was asked by Putnam, Pence, and Jaeger (1995, p. 57) with "How good is good enough?" and answered with "by making judgments."

This is a legitimate validity and reliability concern. Supporting information discusses this concern along with the selection of a holistic rubric design as an assessment tool. This subjective, qualitative procedure best addresses this concern of how defining a rating because it maintains the authenticity of the performance. The rubrics were shared with the focus group for feedback and to ensure the information captured by the researcher is accurate and reflects the intention of the focus group. The process of using these documents and the results are captured in the following chapter along with the modification in the data collection process.

Summary

The qualitative methodology and design of the unobtrusive measures and focus group provided a solid foundation for the next phase of data collection. The design of these two elements remained intact from the onset of the study and were successful in gathering

crucial data for the study. The daunting task of eliciting a set of core competencies best learned in education was a formable challenge for the group. There was no limit on the number of competencies, but consensus was a goal. Following the structured process of accepted best practice of a focus group, consensus was achieved on every competency. Consensus occurred after openly discussing and at time debating a point. Each member of the focus group maintained a professional approach to the process. The objective and end goal of the process remained at the forefront of the reason for participating in this study. The researcher is indebted to the group for their time and inputting their expertise in this phase of the research.

CHAPTER V

DATA COLLECTION: QUALTRICS QUESTIONNAIRE

The qualitative data collection was conducted utilizing the Qualtrics online software program. A questionnaire (see Appendix B) was built on questions about complex performances (the universe) from the ten core competencies (the attributes of the universe) reached by this study's focus group in phase two. After a redesign of the data collection in phase three, a modification research application was submitted and approved by the Institutional Review Board (IRB) office. The questionnaire was required to be fully developed and was submitted with the IRB modification application. IRB approval for the modification and use of the questionnaire was obtained prior to contacting or inviting any academic program or fire department to participate in this study. IRB approved stamped letters were sent via electronic mail from the researcher to:

- Program administrators of fire-related bachelor degree programs in the United States with regional accreditation.
- Fire service members responding to an advertisement in a specific fire-service news service website.
- Listserv electronic mail sent to fire service members from major fire service organizations in the United States.
- Fire service personnel across the United States that are known to the researcher.

The recruitment list of academic programs was compiled from an exhaustive internet search that met the minimum criteria for participation as being affiliated with a regionally accredited college. Twenty-six recruitment letters were sent via electronic mail to program administrators of fire-related degree programs. It was expected several questionnaires would be completed by each program leading to an acceptable data set. Additionally, the recruitment of fire service members was broad in scope as noted above. It was expected this broad recruitment would produce a significant data set beyond the pre-test criteria of the Guttman model.

The questionnaire consisted of two branches of questions – one branch for academic programs and a second branch for fire department members. Each branch had 40 questions and designed in a similar manner. The responses were mostly multiple choice along with several additional questions. Two of the supplemental questions were open-ended comment boxes. Each question included an opt-out feature to meet IRB criteria and approval along with the following:

- The standard consent form was written into the questionnaire as Question 1. This was needed since the identity of the participant would not be known and signature or in-person consents were not possible. Potential participants could select "I Consent to Participate" or "I Decline (Opt Out)." This informed consent met IRB approval and ensured potential volunteer participants consented prior to taking the questionnaire.
- Question 2 asked the participant for their affiliation type – academic program or fire department. This question guided the participant to a specific branch of questions appropriate to their affiliation.

- Prior to answering any questions, participants were provided a detailed description defining each competency level rating. It was solely a descriptive block. This description detailed the definition of mastery, developing, novice, and deficient levels to rate a person's performance. The ten competency definitions and sample activities were nearly identical across each of the questionnaire branch. This information was provided third in the questionnaire sequence and had no answering point.
- As the participant entered the assessment portion of the questionnaire, each competency had a block of three questions to be answered (shown below). Each question included an opt out choice; or designed so the question could be skipped. This design was required to meet IRB approval, but permitted the submission of incomplete questionnaires.
- The participant could withdraw consent and end their participation at any point without penalty.
- After the ten competency blocks of questions, additional questions were asked, depending on the questionnaire branch. These additional questions provide supplemental data to better understand the population group and assessment process in a field.

Table 4 below summarizes the 142 total access point notations over the life of the questionnaire. Participants at each access point are anonymous. IRB required that no internet protocol (IP) data be collected; therefore, this function was disabled in Qualtrics. Eight access points were exited prior to any input recorded and five access points had "opt-out" selected. Consequently, the questionnaire ended with no data collected for

these 13 access points. There were eight access points with academic program selected and 121 access points with fire department selected. One academic program questionnaire had no data entered and was removed from consideration. One questionnaire was partially complete and six were fully complete. Twenty-six fire department questionnaires had no data entered and were removed from consideration. Sixteen questionnaires were partially complete and 79 were fully complete. Responses recorded from August 1, 2018 through October 26, 2018 are listed in Table 4 below as ordered by Qualtrics from oldest (page 8) to most recent (page 1). Specific dates of a questionnaire are not listed.

Table 4

Questionnaire Access Point Totals by Selection in Question 2

Page	Academic Program	Fire Department	No Entry	Opt-Out	Total Entries per Page
8	1	0	1	0	2
7	6	12	1	1	20
6	0	19	0	1	20
5	0	19	1	0	20
4	1	17	2	0	20
3	0	19	0	1	20
2	0	19	0	1	20
1	0	16	3	1	20
Total	8	121	8	5	142

A total of 102 questionnaires – seven from the academic program branch and 95 from the fire department branch – were used in the final data analysis, which is a 71.8% data completion rate. A nearly 30% rate of incomplete data collection is significant and highlights the nonresponse bias error that may have negatively impacted the data analysis results. An accurate rate of return cannot be determined in an IRB approved

questionnaire such as this. The only determination is the rate of data completion from the access point notations. Errors in conducting questionnaires take on several forms, one of which is significant in this study – nonresponse of respondents. A primary concern with the low questionnaire submission and completion rate is the nonresponse bias that is generated when questionnaires are not taken by a sample population (Dillman, Eltinge, Groves and Little, 2002; Peytchev, 2013). The two forms of nonresponse – unit and item nonresponse – is a significant concern in research (Dillman, Eltinge, Groves & Little, 2002, p. 3), but the bias that ensues is even greater (Peytchev, 2013). The main concern encountered in this study was unit nonresponse. To try to improve the response rate in this study, the researcher attempted to gain a broad audience of potential participants through personal and institutional outreach efforts that included placing an ad on a national fire service media website. Many outreach efforts by the researcher went unanswered with both academic programs and fire service entities. Even with the low participation rate, the research design fit the characteristics of a pre-test under the Cornell technique and qualifies for adequate data analysis. All partially completed questionnaires were used in the data analysis, which follows the Guttman (1947) scale analysis process.

The data collection modifications will be highlighted next and followed by the results of the data collection. First, academic program recruitment was expanded to include all fire-related academic programs with regional accreditation – the program accreditation requirement was removed. Maintaining a peer-program association with a regional accrediting body was necessary for meeting sampling guidelines. This expansion more than doubled the number of academic programs recruited and met IRB guidelines. Second, fire service recruitment expanded to include all fire service personnel in the

United States. The recruitment is further explained below. The fire officers being assessed were asked to have a bachelor's degree from a regionally accredited college in order to have a reasonable equivalency to students currently in a bachelor's degree program. Third, the population expansion permitted the research design to utilize the Guttman Scale Analysis Model. The primary benefit to using the Guttman model was the ability to quantify qualitative data in a manner to improve the understanding of "how well a person can do the job, or, perhaps, how much of the job a person can do well" (Green & Wigdor, 1991, p. 1). Fourth, removing the final interview in phase four did not negatively impacted the final study results. The Qualtrics questionnaire adequately served the intent of the interview data collection set.

The redesign of the data collection process simplified and expedited the process as much as possible. It is critical data supports comprehensive data analysis in a research project such as this. However, even the redesign did not increase participation as expected. Therefore, questionnaire data from academic programs is combined with the fire service data for the scale analysis. It was found combining this data did not significantly influence the scale analysis in either direction.

Academic Program Data

It was anticipated data from academic programs would be a good resource for data collection and be complementary in the number of respondents to the fire service. This did not occur. Therefore, data from academic programs will be presented next with limited analysis and insight. The questionnaire asked that the rater of a student performance be a faculty member familiar with the student and the performance. It was

expected some of the competencies would not be assessed in every program. The student performance rating is reflective of expectations defined by each program. These ratings are defined within the academic environment and not necessarily reflective of what occurs in the workplace. First, each core competency had a set of three questions to be answered. Responses to the ten competencies with seven student ratings are summarized in Table 5 below. The set of three questions were similar throughout the questionnaire and consisted of the following:

- How well does the student perform in regards to [core competency]?
    - Answer options: Mastery, Developing, Novice, Deficient, Not Applicable.

Table 5

Summary of Competency Performance by Students

	Performance Rating				
	Mastery	Developing	Novice	Deficient	Not Applicable
Management	2	4	1	0	0
Leadership	1	4	2	0	0
HRM	0	6	0	0	1
Risk Mgmt	2	3	1	0	1
Fire Admin	3	2	1	0	1
Analytical	1	3	1	1	1
Political/Legal	1	4	1	0	1
Budgeting	1	3	2	0	1
Ethics	2	3	1	0	1
Communication	1	4	1	0	1
Total	14	36	11	1	8

Note. HRM = human resource management; Mgmt = management; Admin = administration.

It is not surprising student performance was rated mostly at the developing level (51%). This rating indicates students are still learning and evolving as in their knowledge, skills, and abilities. There was a close rating between the mastery and novice levels (20% to 16% respectively). Only one student received a deficient rating (analytical competency).

Again, there is very little data to make any solid conclusions, but a beginning trend can be seen in this data.

- For a student in your program, how important is knowledge of the principles of [core competency]?
    - Answer options: Critically Important, Moderately Important, Minimally Important, Not Important.

Table 6

Importance of a Competency in Academic Program

	Importance			
Competency	Critical	Moderate	Minimal	Not
Management	5	2	0	0
Leadership	5	1	0	0
HRM	2	4	0	0
Risk Mgmt	5	1	0	0
Fire Admin	4	2	0	0
Analytical	3	3	0	0
Political/Legal	3	2	0	1
Budgeting	3	3	0	0
Ethics	5	0	1	0
Communication	6	0	0	0
Total	41	18	1	1

Note. HRM = human resource management; Mgmt = management; Admin = administration.

Table 6 shows there is overwhelming support for the criticality of the competencies to education. Also supporting this data is the next question shown in Table 7 below, where the corresponding core education is provided to meet this criticality. These two data sets are a significant and complementary finding, albeit a low in numbers.

- Where are the principles of [core competency] taught in your program?
    - Answer options: Core Course, Elective Course, General Education Course, Not in Curriculum.

Table 7

Location of a Competency in Curriculum

	Course			
	Core	Elective	General Ed	None
Management	n/a	n/a	n/a	n/a
Leadership	4	1	1	0
HRM	6	0	0	0
Risk Mgmt	6	0	0	0
Fire Admin	5	1	0	0
Analytical	5	1	0	0
Political/Legal	5	0	1	0
Budgeting	5	0	1	0
Ethics	4	1	0	1
Communication	3	1	2	0
Total	43	5	5	1

Note. HRM = human resource management; Mgmt = management; Admin = administration; Ed = education.

Two final blocks of questions were asked that supplement the rating of each core competency. The first block of questions asked were about the overall judgment, which were:

- In your opinion, what is the most appropriate overall rating of the student being assessed?
    - Answer options: Mastery, Developing, Novice, Deficient.
        - Two were rated Mastery, four as Developing, and one was not answered.
- Does the rating in the previous question accurately capture the overall performance of the student?

- Answer options: Yes, No.
    - All respondents indicated Yes.

The additional questions asked were:

- What, if any, competencies **not listed** in this survey, **are pertinent** in your program and should be listed for the bachelor degrees? Enter the word "None" if you have answered this question on another student. If you prefer not to answer, please enter "None."
    - Answer option: [comment box].
        - A summary of the comments from this question include, but are not limited to: fire-related human behavior, community risk reduction complexities of wildland fire suppression, and program management.
- In your opinion, would an assessment process such as in this survey be **beneficial** or **not beneficial** in providing educational guidance to a student in your program?
    - Answer options: Beneficial, Not Beneficial.
        - All respondents answered Beneficial.
- Please provide a brief explanation of your previous answer. Enter the word "None" if you have answered this question on another student. If you prefer not to answer, please enter "None."
    - Answer option: [comment box].
        - A summary of the comments from this question include, but are not limited to: it is a helpful tool for advising and guiding students on their educational path and for program improvement.

Each respondent indicated the assessment tool accurately reflected the overall performance of the student and would be beneficial in enhancing the development of their students. This is a significant finding. The foundation of the study does provide guidance for further developing a competency assessment process for the fire service and related academic programs. Furthermore, respondents provided additional competencies that should be considered, which include human behavior, community risk reduction, program management, and wildland fire suppression complexities. Appendix A provides the full list of questions and answer options for academic programs.

Fire Service Data

The data received from fire service members provides an initial understanding of competency performance. It was preferred the fire service member being assessed have a bachelor's degree from a regionally accredited college. This was achieved with 35 questionnaire returns (35% of the population), 17 are listed as no degree achieved, and 21 are listed as unknown. There is a comparable trend in data between academic programs shown in Table 5 above and that obtained from the fire service in Table 9 below. A comparison of these two data sets is illustrated in Figure 6 below. Fire officer performance rated at the developing level was indicated at 49%, with mastery performance at 19%, and novice performance at 18%. This data indicates fire officers are still learning and evolving in their knowledge, skills, and abilities in a comparable manner to students. This result is supported by the data showing that 48% of fire officers rated in this study as having a bachelor's degree. Potentially 52% then could performed at a higher rating if education was a part of their professional development.

Each fire service core competency had a set of three questions to be answered similar to academic programs. The questionnaire asked that the rater of a fire department member's performance should be a fellow fire service member familiar with the performance of the person being assessed. It was expected that some of the competencies would not be assessed in every department. The set of three questions were similar throughout the questionnaire and consisted of the following:

- How well does the fire service member perform in regards to [core competency]?
    - Answer options: Mastery, Developing, Novice, Deficient, Not Applicable.

Table 8

Summary of Competency Performance by Fire Officers

	Performance Rating				
Competency	Mastery	Developing	Novice	Deficient	Not Applicable
Management	19	53	16	5	1
Leadership	17	59	8	7	3
HRM	9	44	26	9	6
Risk Mgmt	17	49	14	8	6
Fire Admin	15	41	20	11	7
Analytical	10	33	20	19	12
Political/Legal	8	37	25	10	14
Budgeting	17	39	17	7	14
Ethics	26	36	11	7	14
Communications	29	36	10	5	14
Total	167	427	167	88	91

Note. HRM = human resource management; Mgmt = management; Admin = administration.

Figure 6: Comparison of Competency Performance.

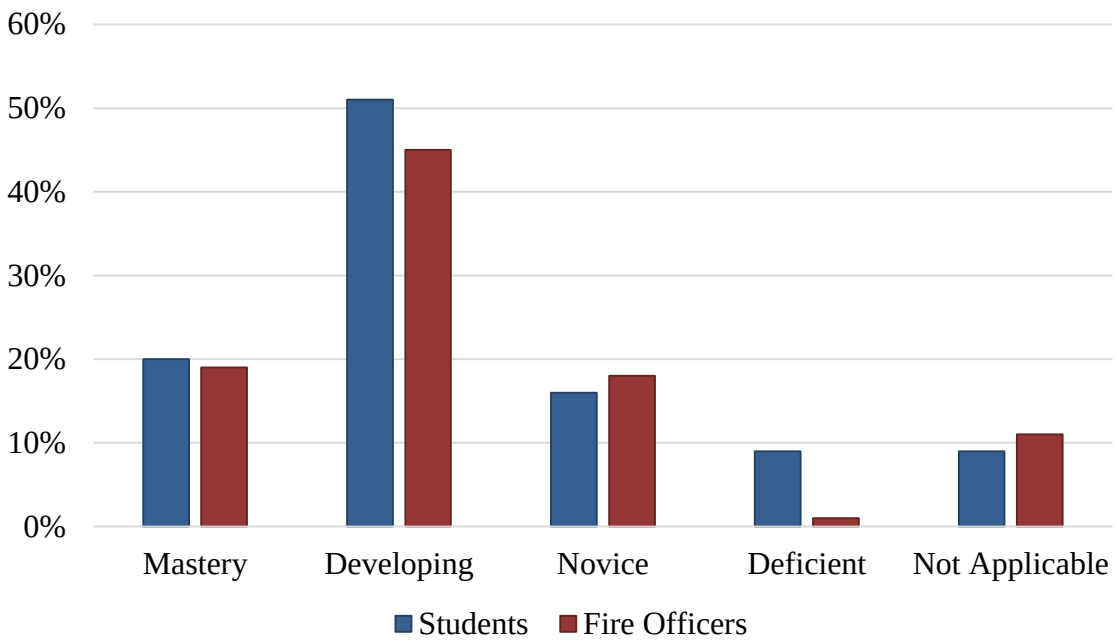

Figure 6. A side-by-side comparison by percentage shows the similarities of competency performance between academic programs and the fire service.

The results of this comparison in Figure 6 show strikingly similar results. The one outlier is at the deficient level. This outlier should be studied to examine if years of experience, a difference in training, or other factor influences this level more than the other levels of performance. Understanding this potential factor could improve the performance of students. The data displayed in Figure 6 also supports the use of a combined data set for scale analysis as there is not a significant variation in results. Next, the importance of each competency is summarized in Table 9 along with a comparison with academic programs in Figure 7 below.

- For an administrative fire officer in your department, how important is knowledge of the principles of [core competency]?
    - Answer options: Critically Important, Moderately Important, Minimally Important, Not Important.

Table 9

Importance of a Competency in Fire Service

	Importance			
Competency	Critical	Moderate	Minimal	Not
Management	72	16	5	0
Leadership	69	15	5	1
HRM	45	35	6	2
Risk Mgmt	56	29	0	2
Fire Admin	45	36	3	2
Analytical	27	44	9	3
Political/Legal	42	27	10	2
Budgeting	43	31	5	1
Ethics	65	12	3	0
Communication	54	21	4	1
Total	518	266	50	14

Note. HRM = human resource management; Mgmt = management; Admin = administration.

The data displayed below is also strikingly similar between population groups as that of Figure 6 above. The significance of this finding reveals that standardization of curriculum is not needed. Academic programs are providing educational courses that support competency expectations in the fire service field. The data here does not support the fragmentation and incoordination of fire service education as stated by Onieal (2005, Part Three, para. 4). This does not lead to a conclusion that improvements are not needed. Considerable change is needed in the professionalization of the fire service. Academic programs and the fire service need to continually assess performance between the two population groups used in this study.

Figure 7: Comparison of the Importance of Competencies.

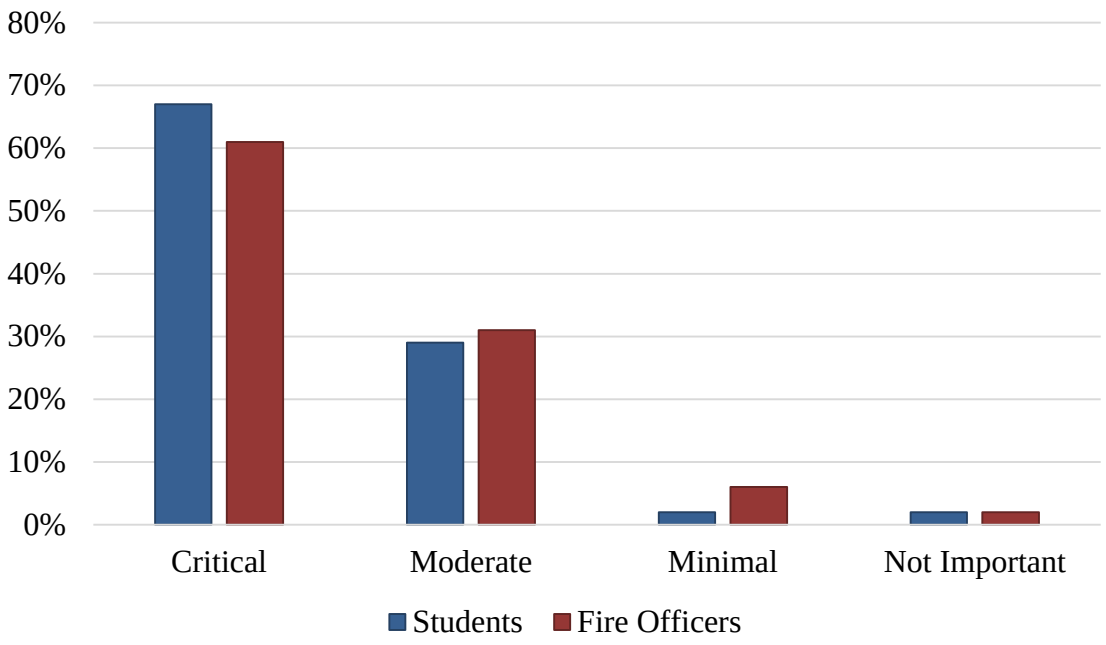

Figure 7. A side-by-side comparison by percentage shows the similarities of competency importance between academic programs and the fire service.

To further show that the data does not support a fragmented educational system, Table 9 indicated that education is critically important to the fire service. Six of the ten competencies are best learned in education. The relationship of education, training, and experience deserves further examination. This relationship should be a critical topic of discussion in the professionalization process. Education, training, and experience are not mutually exclusive in consideration. They are integral elements of a person's professional development and should be clearly defined. The CPSE, IAFC, and NFPA should have complementary statements of inclusion for each other and not be standalone documents without direct reference to the greater picture.

- In your opinion, where are the general principles of [core competency] best learned?

- Answer options: Education, Training, Experience.

Table 10

Location of Where a Competency is Best Learned

	Education	Training	Experience
Management	44	21	27
Leadership	28	24	38
HRM	53	31	4
Risk Management	33	40	14
Fire Admin	57	15	14
Analytical	64	16	4
Political / Legal	31	13	37
Budgeting	38	18	24
Ethics	31	17	32
Communication	39	17	24
Total	418	212	218

Note. HRM = human resource management; Mgmt = management; Admin = administration.

A comparison of Table 7 (Location of a Competency in Curriculum) and Table 10 above shows a significant positive finding. Competencies used in this study are being taught in core courses and are best learned in education. The foundation for further studies on competency assessment are present in this study's pre-test data set.

The final blocks of questions were asked after rating of each core competency. The data summaries here are broken down per question due to the size of the data. The first block of questions asked were about the overall judgment, which were:

- In your opinion, what is the most appropriate overall rating of the fire service member being assessed?
    - Answer options: Mastery, Developing, Novice, Deficient.

Table 11

Overall Rating of the Member Being Assessed

Overall Rating			
Mastery	Developing	Novice	Deficient
15	52	7	4

- Does the rating in the previous question accurately capture the overall performance of the fire department member?
    - Answer options: Yes, No.
        - There were 76 answers, which included 70 Yes (92%) and 6 No (8%).

The second block of questions asked were general questions, which were:

- How many years of experience do you have in the fire service?
    - Answer options: 0 to 5 years, 6 to 10 years, 11 to 15 years, 16 to 20 years, 21 to 25 years, 26 to 30 years, more than 30 years.

Table 12

Years of Service of Rater

Years of Service						
0 to 5	6 to 10	11 to 15	16 to 20	21 to 25	26 to 30	> 30
0	1	10	8	26	14	20

- What is the department rank of the fire service member being graded?
    - Firefighter (FF), Driver/Operator (DO), Company Officer (CO), 2 Bugle Chief, 3 Bugle Chief, 4 Bugle Chief, 5 Bugle Chief.

Table 13

Rank of Member Being Assessed

Rank of Member						
FF	DO	CO	2 Bugle	3 Bugle	4 Bugle	5 Bugle
2	3	21	9	14	10	18

Note. FF = firefighter; DO = driver/operator; CO = company officer.

- What, if any, competencies **not listed** in this survey, **are pertinent** in your department and should be listed for the administrative fire officer? Please enter the word "None" if you have answered this question on a previous member. If you prefer not to answer, please enter "None."
    - Answer option: [comment box].
        - A summary of the comments from this question include, but are not limited to: study of human nature, problem-solving, dispute resolution, interpersonal relationships, public administration, technology, change management, and emerging health and safety trends.
- In your opinion, would an assessment process such as in this questionnaire be **beneficial** or **not beneficial** in providing professional development guidance to a member in your department?
    - Answer options: Beneficial, Not Beneficial.
        - There were 78 answers, which included 62 Beneficial (79%) and 16 Not Beneficial (21%).
- Please provide a brief explanation of your previous answer. Enter the word "None" if you have answered this question on a previous member. If you prefer not to answer, please enter "None."

- Answer option: [comment box].
    - A summary of the comments from this question include, but are not limited to: any peer or 360-assessment is helpful, education needs to be balanced with experience, succession planning, self-actualization through various means, and objectivity in assessment.

Fire service respondents indicated the assessment tool accurately reflected the overall performance of the officer, with 92% rating. The assessment tool was also rated highly; with 79% stating it was beneficial. To see the full questionnaire of questions and answer options for fire departments, please see Appendix A.

Guttman Cornell Technique Analysis

The Cornell technique is used in this study to explore the scalability of the universe of fire officer performance to the ten attributes (i.e., competencies). The analysis of qualitative data comes from the questionnaire as presented above and shown in Appendix A. The steps of the Cornell technique for scalogram analysis were outlined in Chapter III and will be described here. The process of scale analysis includes "successive approximations" (Guttman, 1947, p. 251). The five weighted categories (i.e., 4-3-2-1-0) are not required to be kept itemized. Combining weighted categories is acceptable. It is possible to achieve adequate analysis with two approximations (e.g., 2-0), which refers to the vertical scalability of each attribute and the error of reproducibility (Guttman, 1947).

Scale Analysis

The initial scale analysis consisted of ratings weighted from a 4-3-2-1-0 arrangement as received from the questionnaire. The 4-3-2-1-0 weighted scores align respectively to the

categories of mastery, developing, novice, deficient, and not applicable or no answer. This is step one of the content scale analysis. Step two is the scalogram ranking score obtained from these weighted itemized scores. Step three is listing all rankings in order from high to low. Steps 4 and 5 are the process of constructing a table to display the data (see Appendix B). Step 6 is the total number of entries per category. Step seven is the first test for scalability. Using the weighted scores of 4-3-2-1-0 does not achieve a scale. The error of reproducibility was below 85% with too many errors versus nonerrors occurring in the vertical columns. For step eight, Guttman (1947, p. 256) states that "it has seldom been found that an item with four or five categories will be sufficiently reproducible if the categories are regarded as distinct." Therefore, numerous attempts at achieving a scale with different weighting arrangements was done. There was one successful approximation using 2-0 weighted scores. The two and zero weighted scores include the following combination of columns. First, the mastery, developing, and novice levels were given a weight of two, except for the management competency. Each deficient or not applicable/not answered rating was given a weighted score of zero. Steps 9, 10, and 11 are the process of reweighting each category and reordering individuals from high to low ranking. Step 12 is determining the error of reproducibility. The data with these weighted scores achieves scalability at or below the 85% percent acceptability of error in each competency. This data is presented in Table 14 below.

Table 14

Error of Reproducibility with Weighted Scores of 2-0

	Weight 2		Weight 0		Error of
Competency	Errors	Nonerrors	Errors	Nonerrors	Reproducibility
Management	3	19	0	80	3%
Leadership	7	85	3	7	10%
Human Resources	2	84	5	11	7%
Risk Management	13	74	2	13	15%
Fire Administration	9	74	3	16	12%
Analytical	3	66	6	27	9%
Political/Legal	1	76	3	22	4%
Budgeting	3	77	2	20	5%
Ethics	5	75	4	18	9%
Communication	6	76	3	17	9%
Total					9%

Cutting points were determined for each category independently to minimize the error. Cutting points approach the examination of data from a rarely achieved perfect scale in order to minimize the error of reproducibility (Guttman, 1947). Appendix C displays the reordered weights and the scalability of the data to this point in the analysis. The determination of a positive scalability of data is found within the acceptable error of 15%. The analysis of scalability does not stop with this examination, as Guttman (1947, p. 260) states "the per cent reproducibility alone is not sufficient to lead to the conclusion that the universe of content is scalable." Each category needed to be evaluated in step 13 to ensure each column had more nonerrors than errors. The data in Appendix C displaying the reweighted categories meets the criteria of step 13. This was done in each column and row with a vertical and horizontal evaluation of data. The vertical error of reproducibility shown in Table 14 above is acceptable. This indicates the attributes of competencies are scalable to the universe of fire officer performance.

The horizontal evaluation of scalability across attributes forms a quasi-scale. "The higher a person's score, the more *likely* he is to give a high response to each item, but there is not the high certainty that exists in the case of a scale" (Guttman, 1947, p. 263). This gradual tapering of responses is visually apparent in the data set of Appendix D that is summarized in Table 15. The higher scores are at the top of the data set and progressing downward. The proposed range of content scores was determined by evaluating all entries from the questionnaire and itemizing each response. This analysis led to a unexpected positive result. A proposed range of content scores could define each overall category of performance rating.

Table 15

Proposed Overall Content Score Ranges per Category

	Proposed Range	Mastery	Developing	Novice	Deficient	N/A	Total
Mastery	35-40	109*	38	2	1	0	150
Developing	24-34	70	321*	81	6	2	480
Novice	17-23	3	54	75*	45	2	179
Deficient	10-16	0	3	8	29*	0	40
Percent Accuracy*		72.6%	66.9%	41.9%	72.5%		849
Percent per Range		86-100	59-85	41-58	25-40		

The quasi-scale of data includes a nearly complete satisfaction of having more nonerrors than errors per individual/per attribute. Only seven itemized entries are not meeting this criterion, which is an 0.82% error. Cutting points between subcategories were easily distinguished by comparing the itemized values in each attribute. These cutting points defined each overall category of mastery, developing, novice, and deficient. This consideration was a specific point of discussion by the focus group. Therefore, a

proposed range of content scores to a defined category rating is given along with a percentile value. For instance, individuals receiving a content score between 35 and 40 are considered overall mastery-level fire officers in the 86% to 100% content score.

Defining a fire officer within a range such as this can enhance quality improvement and accountability. Quality improvement can be achieved when this type of assessment is used to augment professional development of the officer. The officer will know exactly how each attribute is scored and how these scores collectively can define the overall level of performance. The benefit to accountability is from reporting of a population's overall performance – not an individual's performance. This insight can be advantageous for program improvement because it is a collective reflection of a population.

The *intensity function* of the Cornell technique is not utilized in this study since ranking students according to their opinion is not included. The intensity function is used to state a degree of favorableness where cutting points split a population into halves – favorable and unfavorable (Guttman, 1947). Guttman (1947) clarifies that more favorable and less favorable ratings is not the same thing as saying a person favorable or unfavorable. "The intensity function provides an invariant zero point for attitudes and opinions" (Guttman, 1947, p. 262). This study is not assessing attitude and opinions to a degree of favorability. Opinions can be bias to the individual being assessed. The assessment tool developed in this study is intended to reduce or eliminate biased opinions. Instead, assessing a performance based on merit and criteria. Therefore, the intensity function outlined by Guttman (1947) with the Cornell technique is not appropriate to include in this study.

Summary

The qualitative data collection outlined provides an exploration into the scalability of fire officer competencies with the use of an assessment tool. The scalability of each attribute had an acceptable error of reproducibility. This finding leads to the ability to determine a person's attribute score from the overall content score. The data associated with this finding is supportive of the role and importance of education in the fire service. Regionally accredited academic programs are providing the core coursework in support of fire officer competency development.

The quasi-scale across each attribute with each individual was also acceptable. The quasi-scale data led to the defining of each rating level with proposed ranges of content scores. This significant discovery directly addresses a concern of the focus group on clearly defining each level. The totality of the data collection can answer the question of how well a person does a job and how much of the job is performed well.

CHAPTER VI

CONCLUSIONS AND RECOMMENDATIONS

This chapter outlines conclusions and recommendations deciphered from the literature and the data. Further questions will naturally materialize as information is presented in this chapter. These questions should be formally studied and subsequent empirical research disseminated. Exploration, examination, and descriptive research provides avenues of in-depth investigation where techniques and operations of the field are challenged. It is with detailed data analysis that future advances of the field are possible. This cyclical process of challenging the current state of something is as Kuhn (2012) described and is a normal practice in the professions. It is with the professionalization of the fire service that the words *status quo* can become obsolete and a greater understanding of the field gained. A discussion about competency assessment, scale analysis, and the criteria of a profession are presented next as a way to spark further research and dialogue.

Competency Assessment

The term *competency* was chosen in this study because it is commonly used in the fire service and in the literature when referring to assessment of performance. Is the term *competency* the right term to use? Since competency could be used to describe tactical

skills, should the term *attribute*, or similar term, be used to describe what is being assessed in the fire service? For example, the term *attribute* is used in the Guttman Scale Analysis Model to define a "qualitative variable" and are also called categories (Guttman, 1944, p. 140). Assessing a single part of a competency does not fully capture a person's ability to do the job or how much of the job can be done. Defining terms for assessment, quality improvement, and accountability in job performance needs a rigorous debate. Attribute provides a broader scope of what is being considered than competency.

Additionally, what is to be assessed and at what level assessment should occur needs further clarification. Complex performances on the job or in education needs to clearly outline these items. For example, assessment at the fire officer level should be more strategically focused than assessment at the firefighter level. Performance at the fire officer level includes more complex situations where assessment should be conducted. The performance is more multifaceted at the officer level than at the firefighter level. Understanding the scope of job performance and the assessment can help guide further areas of training, education, and experience that enhance professional development and lifelong learning habits.

Developing a framework for national competency assessment standards is crucial in the professionalization of the fire service. The framework should guide the process and not dictate a single procedure. Flexibility is needed to accommodate different knowledge, skills, and abilities in different jurisdictions. This will need to include describing expectations of fire officer performance on the job. The results of the data collection show overwhelming support for the assessment tool developed in this study. There is a combined 77% positive reflection on the assessment tool. Fifteen participants did not

answer the question – this is an overall 18% reduction in potential data collection to this question. There is also a combined 92% positive reflection on the accuracy of the assessment tool. Seventeen participants did not answer the question – this is an overall 21% reduction in potential data collection to this question. In the end, the goal of assessment is to determine the outcome of performance for quality improvement and for reporting outcomes to stakeholders. Having a better understanding of what is being assessed, how it is assessed, and at what level the assessment occurs – will help guide the type of performance in terms of outcome assessment.

Scale analysis allows reports on groups, not individuals, for accountability. This type of reporting is common in higher education. The fire service can replicate this type of reporting to stakeholders at the local, state, regional, and federal levels. Providing the public and elected officials with reports on competency assessment supports credibility of the field along with meeting one element of a profession. This credibility could potentially influence negotiations of contracts, budgets, or other critical decisions that impact service delivery (e.g., tax propositions, grant proposals).

Competency assessment results in this study could include fire officers serving in career or volunteer fire departments. A delineation between career and volunteer members or the rank structure of fire departments was not made. The National Fire Protection Association (NFPA) 1021 standard states that the "job performance requirements can be used in any fire department in any city, town, or private organization throughout North America" (NFPA, 2014, p. 1). Inferring that the competency assessment in this study is limited to fire officers in career fire departments would be an incorrect assumption. The effect of setting certification or licensure standards for admittance to or revocation from

the fire service specific to volunteers is not known and was not studied. Studies examining this dynamic could provide valuable insight into an occupation whose membership is 65% volunteer (Evarts & Stein, 2019).

Scale Analysis

Conducting scale analysis in the Cornell technique requires the evaluation of data vertically within each attribute and horizontally across all attributes. The vertical data analysis shows the ten attributes (i.e., competencies) are scalable to an acceptable error of reproducibility at or below 15%. All but one attribute (management) was weighted 2-2-2-0-0. This grouping of weighted scores puts performance levels into acceptable (weighted 2) and deficient (weighted 0) positions. Eight of the ten attributes had an error of reproducibility at or below 10%. This vertical analysis permits the conclusion that those individuals above the cut line performed acceptably. During the data analysis it was hoped the weighted scores would be scalable at 4-3-2-1-0. The scores were also not scalable at 3-2-1-0 or 2-2-1-1-0. Therefore, the conclusion of distinction of performance was best achieved as a dichotomy. Defining how well an individual performs parts of a job is achievable here and creates where specific points of improvement can be made.

It is expected that as the attributes of expected performance for fire officers are better understood and defined the weighted scores will retain more of a distinct appearance (i.e., 4-3-2-1-0). From this, a better prediction of performance level can be achieved based on a ranking score. This is possible because having distinct attribute scores will create greater diversity in the ranking scores. Retaining data from incomplete questionnaires is a procedure in the Guttman Model (Guttman, 1947, p. 253), which may have skewed

results negatively, affecting the error of reproducibility of each attribute. Future research should consider this influence and work to limit unanswered questions.

The horizontal data analysis across each attribute shows good results where clear cutting points were made to define each level of performance. This analysis differs from the vertical analysis in that performance could be described distinctly. The horizontal cutting points differentiated each level of performance where the majority of persons performed within that level. Once the majority of the number of performances moved to the next level, the cutting point for that level was drawn. The cutting scores are not a perfect alignment; but, there is a clear definition of drawing cutting points. The results show a person with a ranking score of 35 to 40 is at an overall mastery level; 24 to 34 at an overall developing level; 17 to 23 at a novice level; and 10 to 16 is at a deficient level. It was not expected this definition of performance levels would be achieved. It does provide a solid foundation for categorizing overall performance and adds to understanding how well a job is performed. The combined vertical and horizontal data analysis in this study answers the questions stated by Green and Wigdor (1991, p. 1) as "how well a person can do the job, or, perhaps, how much of the job a person can do well."

This type of data can lead to the quality improvement of officers who should be continuously evolving in their position. The amount of mentoring and coaching of these officers should be individualized with varying levels of support and guidance. It is not proposed that this information be used in job performance evaluations. The goal here is quality improvement of the individual with each attribute and with overall performance. Discussions should be open and honest with a positive outlook on future achievement.

These discussions and assessments may be from persons not directly related to supervision. It can come from any source who can provide the depth of feedback needed in this process.

Criteria of a Profession

Viewing the criteria of a profession on a continuum can help identify gaps in the professionalization process. Each criterion of a profession can be defined as a quality improvement or accountability element. They are key to the professionalization process. The fire service falls short of being called a profession because there is no recurring competency assessment, autonomy for a fire department, formalized code of ethics, or professional association regulating the admittance, renewal, or revocation of personnel serving in the field. A visual representation of this is shown below in Figure 8.

Figure 8. Criteria of a Profession Comparison for the Fire Service.

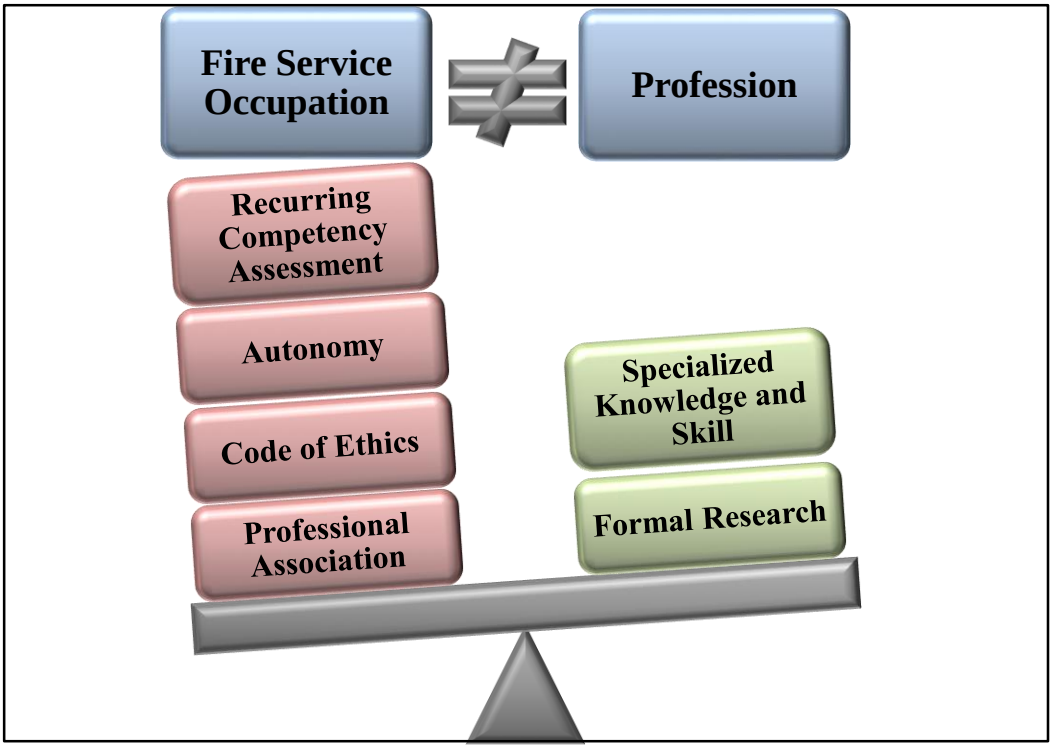

Figure 8. A visual representation of the criteria of a profession is provided to show the mostly occupation status of the United States fire service. The fire service does have two criteria to some level. The literature does point to more is needed on all the criteria for the fire service to professionalize.

A significant conclusion from this study concerns the deficiency in certifying or licensing fire service members at every rank. This is both a quality improvement and accountability concern. There needs to be an adopted national standard and regulatory authority to move the professionalization process forward. While this will most likely generate some angst from some in the fire service, it is a must if the fire service wants to professionalize. The fire service can take a proactive role in developing an accountability system. The foundation is already in place with the documents presented from the Center for Public Safety Excellence (CPSE), the International Association of Fire Chiefs

(IAFC), and the National Fire Protection Association (NFPA) to support such a process. A regulatory process of certifying or licensing fire service members as practitioners at every rank and at regular intervals should be a priority. It is recommended the documents from the CPSE, IAFC, and NFPA be updated after comprehensive research is done to help guide the defining elements and terms.

The literature also indicates the current emergency response model is outdated, not affordable, and vulnerable to outsourcing. Action is being taken by the public and elected officials in the privatization, regionalization/consolidation, and devolution of fire services. It is recommended the fire service study the effects of these actions to determine their validity and viability. Research is needed on how emergency response models can change. The research into these vulnerabilities, or any fire service element, can produce favorable or unfavorable information. The fire service needs to drive this change in a direction that is good for the public it serves and addresses the criteria of a profession. What underlies the field if research is not a priority and built into the primary mission of every fire department and fire service organization? The research that is occurring in the fire service shows great promise and should be recognized as a positive push in the drive to be proactive. The fire service has many pieces in place to formally professionalize the field. A national collaboration could bring action to a stagnate state of affairs. The collaboration will need to bring stakeholders from all pertinent areas to the process.

Additionally, the data collection challenges encountered during this study should not be endured by any researcher. A research community within the fire service should provide the needed support and resources for conducting research. Driving change occurs when

empirical research informs decision making in the field. Reacting to change is sitting back and reading what others have studied and written about. It would be prudent to have a central location to assemble fire service research and assist in coordinating efforts between researchers and entities. Persons or organizations conducting research should be able to collect data in a manner that is broadly supported by the field. This research deserves publication with the rigor of peer-review. One peer-reviewed journal for the fire service is insufficient to meet the need of a profession. Once again it will be stated that great work is being done. The International Fire Service Journal of Leadership and Management provides a guiding light and foundation for additional peer-reviewed journals to establish and publish fire service generated research.

Developing research-based empirical information will require an internal fire service research community. There needs to be collective support and vision for the research community. Research should be focused on specific areas of need across all aspects of the fire service field. This level of involvement will be paramount to building a future of the fire service driving change. It is hoped this conclusion is a catalyst for more research in the fire service. Because of this, it is advocated that more fire departments in the United States embrace and be involved in formal research. This will naturally lead to firefighters at all ranks participate in department sponsored research activities. Furthermore, advocating graduate-level academic degrees will improve the understanding of the research process. The Executive Summary of the Research Agenda should not have to state "…the broader fire service often has very little interface with it, and may subsequently lack understanding of its true impact" (National Fallen Firefighters

Foundation, 2016, p. ii). The fire service needs to develop a fire service based research community to support this endeavor and disseminate research.

Research Questions Revisited

Revisited here are the central research question and five subquestions to bring closure to this research study. The central research question explored in this study was – what fire officer competencies are relevant to the United States fire service? Ten competencies were reached by consensus of the focus group and subsequently assessed. The ten competencies were based off of information from the CPSE, IAFC, and NFPA. This collection of competencies was a variation of what a fire officer could possess. It is evident that each of these organizations approaches competency of a fire officer from a different perspective. Each document has elements that move the discussion of fire officer competencies in a positive direction.

While exploring this question, it was learned that while competencies can be defined today, they may not be relevant in the future. The literature outlines the dynamic nature of the fire service and that change is needed for sustainability. While some change has been recognized in the fire service; defining a set of competencies with widespread acceptance has not been attained.

The work of the focus group in this study demonstrate how a group of experts can work through a multitude of considerations to come to a consensus on a set of competencies that should be learned in education. Figure 9 below depicts this success which was corroborated by the fire service to be critically important.

Figure 9. Importance of Competencies to the Fire Service.

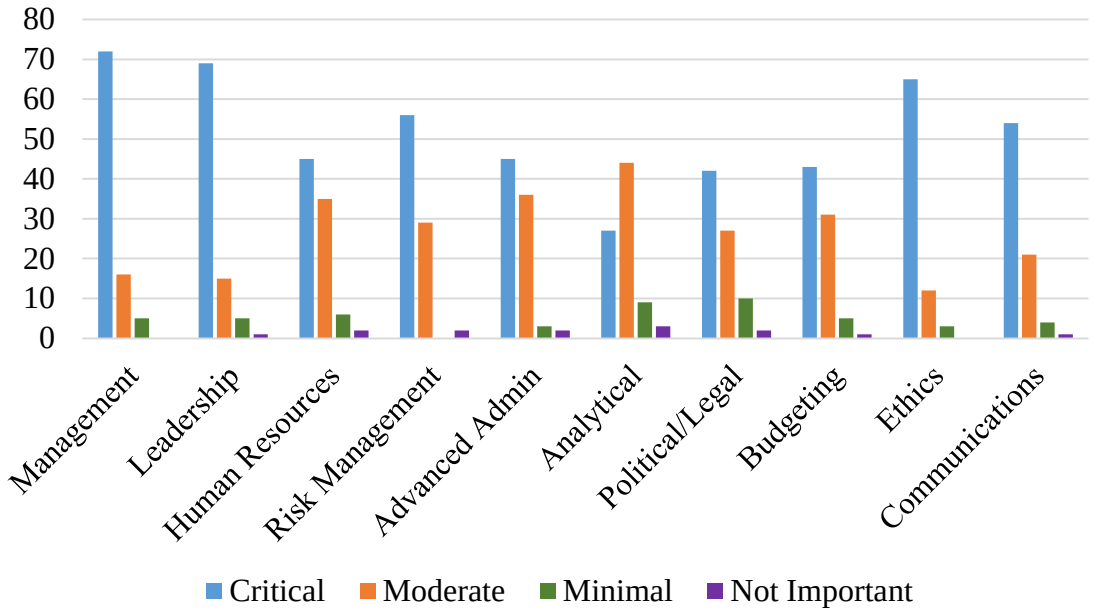

Figure 9. A visual representation of the importance of each competency is provided to show overwhelmingly the significance of the list. The analytical competency is the only one showing a greater rating at the moderate level. Further research is needed to better understand this outlier. It is evident each competency is important to the fire service and academic programs.

The first subquestion was – what benefit is there for conducting fire officer competency assessment in academic programs or the United States fire service? The primary benefits found were quality improvement and accountability. The benefits of assessment are overwhelming supported in the responses from academic programs and fire service members. This support was focused on the quality improvement aspect of assessment. Accountability was not studied in this research, but warrants such attention.

Cautionary considerations with assessment were consistently stated from the focus group and questionnaire respondents. This includes clearly defining each

level of achievement, ensuring the rating is based on the first-hand account of performance, and the information is used to enhance performance. The levels of achievement defined in this study are an example of how fire officers can be categorized through assessment. Having an open discussion and detailed feedback on performance is of upmost importance when working towards quality improvement. This type of discussion removes any reference to performance evaluations as a condition of employment. The focus is on improving an individual's performance.

The second subquestion was – where are fire officer competencies best learned? While the education category leads most responses, there is a mix of perspectives. A conclusion from this data set is that education, training, and experience all play a role. A competency can be learned in education, then furthered with training and experience. Unanswered questions with this data set are, which one of these three elements comes first and how do each support each other in the professional development of fire officers? These questions would be good research topics for the future. Figure 10 below provides a visual representation of the data of where competencies are best learned.

Figure 10: Location of Where Competencies Are Best Learned.

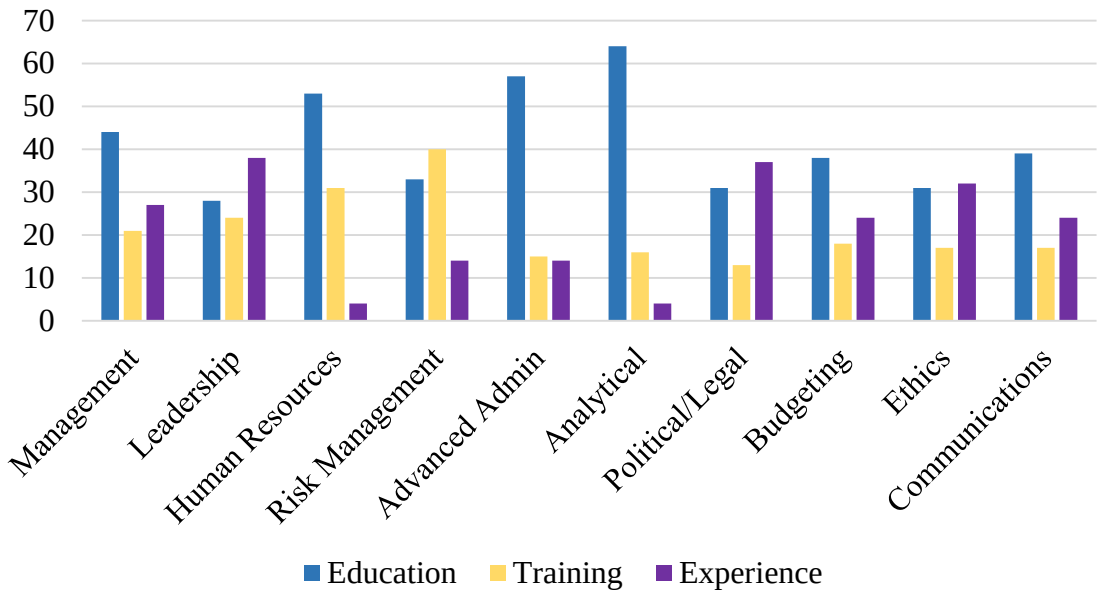

Figure 10. A visual representation of the location of where each competency is best learned is provided to show the mixed results. The results of this data set deserve greater discussion to clearly identify a professional development plan for fire service members. Further research is needed to better understand this data set.

The qualitative comments from the questionnaire help explain this mixed data. Three comments specifically address this by encouraging us to not say the answers are mutually exclusive. The categories should be examined together with each element playing a role in the development of fire officers. The conclusion is to ensure education, training, and experience are included in fire officer development. This information was a surprising insight considering elements of professional development. The relationship between each was not explored, nor was the influence each potentially had on the other. This multidimensional relationship should be examined in the future.

The third subquestion was – what consistency in curriculum exists across regionally accredited fire-related baccalaureate degree programs in the United States? There is very little data to form a conclusion or recommendation on this question. The data that was obtained shows the competencies defined in this study are core courses in baccalaureate degree programs. There is a good indication that regionally accredited academic programs are meeting the needs of the fire service community. Further research into this relationship is needed.

A point of emphasis relating to this question from the literature is that standardized curriculum should not be endorsed. Standardized curriculum contradicts regional accreditation guidelines and is counterproductive. There should be a goal or aim of fire-related education that is based on learning outcomes. How academic programs address learning outcomes must remain a determination of each program with guidance from advisory boards and jurisdictional needs. Reviewing the literature from emergency medical services and the medical field provides a good orientation to how this can be achieved. It is doubted the fire service wants to be micro-managed from any external force. The same doubt of micro-management should be extended to the education system.

The fourth subquestion was – what framework of professional development exists in the fire service? The conclusion to this question was quite evident – a lot exists, but what is present is separated and disjointed. Returning to the central research question above, professional development guidance is provided from the CPSE, IAFC, and NFPA. Bringing these guiding documents and other entities to

the table to discuss the future of professional development is needed. There should be clear points of emphasis from each which intertwine with other elements – not stand alone documents or missions. Personal experience and discussions provide additional support for this conclusion.

Professional development should support quality improvement and accountability of the fire service membership. As seen above, the elements are not mutually exclusive – but a system of interconnecting elements that support the overall development of fire service personnel. A national collaborative effort is proposed. This collaboration should include many stakeholders to comprehensive examine and develop a system of professional development that can support the fire service professionalization process.

The fifth subquestion was, does the United States fire service meet the criteria of a profession? It is clearly evident from the literature that the United States fire service is not a profession. It is also noticeable that the fire service has pieces of professionalization criteria in place. The three fire service organizations used in this study – the CPSE, the IAFC, and the NFPA, can be the primary elements on which to build the fire service profession. Professionalizing the fire service will take time and effort from many entities and stakeholders. The National Fallen Firefighters Foundation (NFFF) is one such organization that helps bring research and firefighter safety to the forefront. Expanding the research to include how competencies can be researched and related to firefighter safety is one recommendation for the future. Another recommendation is the redefining of the fire service mission to meet today's societal needs. The fire service continues to

react to societal needs and demands. Outsources of these services continues as needs and demands are not met. Threats to the traditional United States fire service continue to be advanced by external forces, some succeeding in altering the service delivery model. External forces have education and research on their side to influence decisions at the community and political levels. Countering this requires a comprehensive redesign of the fire service from a reactive occupation to a profession that drives change.

Therefore, promoting research from within the fire service is another recommendation. The IAFC already has divisions in the United States that could help build the research community. The International Association of Fire Fighters is also involved in research. These entities are already investing resources in research projects. What is needed are research projects by many more individuals and entities. These projects should not be done in isolation, but a consortium of organizations coming together to support the process. All fire service members should explore how they could best participate in research. Achieving an active research community in the fire service will take education, training, and experience. Fire service members must realize the value in each element as they build a professional portfolio – not just a resume. Research will help drive ingenuity, innovation, change, and professionalism. Discounting this as rhetoric would be discounting all the fire service experts and reports that have repeatedly tried to encourage the fire service to move in a new direction.

Summary

The time has come for the United States fire service to officially professionalize the field to build a sustainable future. This study put forth literature on assessment of competencies and how this is related to professionalization process. The competencies are based on the specialized knowledge and skill that are paramount to a profession. Widespread perceptions, traditions, and practices in the United States fire service should be researched and challenged. As stated in the literature, status quo enables external forces to impose influence on the field and advance new agendas thus threatening the fire service. The change process is not to be underestimated in its complexity and challenges, but change is possible with sound strategies and broad involvement of the fire service membership. The change process in the fire service needs to extinguish status quo traditions and disparaging slogans. The time has come to ignite new ideas and operational strategies with formal empirical-based research. The fire service needs to develop a sustainability strategy for the future and drive change – not react to it. The fire service should take on the difficult challenges outlined in this study and professionalize the field; or suffer the consequences of an occupation left behind by the times.

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APPENDICES

APPENDIX A: QUALTRICS QUESTIONNAIRE

Assessment of Fire Officer Competencies

Q1 College of Engineering, Architecture, and Technology

PARTICIPANT INFORMATION Form
In Pursuit of Professionalism: An Exploration of Academic Assessment of Fire Officer Competencies

Background Information You are invited to be in a research survey about the assessment of student learning or fire officer performance as it relates to ten fire officer competencies. We ask that you read this form and ask any questions you may have before agreeing to be in the study. Your participation in this research is voluntary. There is no penalty for refusal to participate, and you are free to withdraw your consent and participation in this project at any time. The purpose of this project is to collect data on 1) the assessment of student learning from *regionally* accredited fire-related bachelor degree programs, and 2) fire department members serving on a United States fire department who hold a fire-related bachelor degree from a *regionally* accredited university.
This study is being conducted by: Lynn M. Wojcik, College of Engineering, Architecture and Technology, Oklahoma State University, under the direction of Dr. Haley Murphy, College of Engineering, Architecture and Technology, Oklahoma State University.
Procedures **If you agree to be in this study, we would ask you to do the following things:** 1) Complete a survey rating a person on ten fire officer competencies, 2) complete one summary rating of the person, and 3) answer a few final questions. The ten competencies were determined in Phase 1 and 2 of this research project. Each participating program or department may or may not assess all ten competencies. Program administrators or fire department chiefs or their designee will determine who will serve as a rater or raters. It is recommended that rater(s) be selected who have explicit knowledge of the performance of a student or fire department member. For educational programs, raters will assess one sample population of students at or near graduation in their respective programs. For fire departments, a rater or raters will assess one member of their department who holds a conferred bachelor degree from a *regionally* accredited fire-related program.
Participation in the study involves the following time commitment: The survey will take 10 to 15 minutes to complete.
Compensation You will receive no payment for participating in this study.
Confidentiality The information you give in the study will be stored anonymously. This means that your name will not be collected or linked to the data in any way. The

researchers will only know that someone has participated in the study. The researchers will not be able to remove your data from the dataset once your participation is complete. Your information will be collected through a Qualtrics Survey. The data will be stored on a password protected computer. When the study is completed and the data have been analyzed, the data will be destroyed. This is expected to occur no later than January 2019. The research team works to ensure confidentiality to the degree permitted by technology. It is possible, although unlikely, that unauthorized individuals could gain access to responses because the survey is online. However, your participation in this study involves risks similar to a person's everyday use of the internet.

Contacts and Questions The Institutional Review Board (IRB) for the protection of human research participants at Oklahoma State University has reviewed and approved this study. If you have questions about the research study itself, please contact the Principal Investigator at (405) 820-2608, lwojcik@okstate.edu. If you have questions about your rights as a research volunteer or would simply like to speak with someone other than the research team about concerns regarding this study, please contact the IRB at (405) 744-3377 or irb@okstate.edu. All reports or correspondence will be kept confidential.

Statement of Consent I have read the above information. I have had the opportunity to ask questions and have my questions answered. I consent to participate in the study. Indicate by selecting one of the options below: I give consent to voluntarily participate in this study as outlined above:

- ○ I Consent to Participate
- ○ I Decline (Opt Out)

Q2 To begin the survey, please indicate your affiliation. This distinction is necessary to ensure you are answering the questions properly worded for your field. If you select "Prefer Not to Respond," you will exit the survey.

- ○ Fire Department
- ○ Academic Program
- ○ Prefer Not to Answer (Opt Out)

Fire department questionnaire is shown first. Academic program questionnaire is provided below.

Fire Department Data

Q3 As you begin the survey you will notice the speed completion increases with each set of questions. Please select the most appropriate level of performance in each competency as defined here.

Mastery – knows which type of analysis or technique to use in creating a plan, report, or proposal in a given situation and puts theory into practice. The background information, analysis, and conclusions are comprehensive and the report is presented professionally. The mastery officer has the ability to function within a competency without guidance and is therefore considered to be well-developed, functioning with minimal direction from a superior.

Developing – uses basic types of analyses or techniques in creating a plan, report, or proposal. Partially puts theory into practice, but is missing comprehensive knowledge in all aspects of a competency. The background information, analysis, and conclusions are incomplete and lacking details. This leads to a mostly professional report that contains errors. The developing officer has the ability to function within a competency but is in need of mentoring or guidance with procedures or concepts, and moderate direction at different times to help further develop knowledge, skills, and abilities.

Novice – applies one or two basic concepts or techniques in an unsophisticated manner and struggles to put theory into practice. The background information, analysis, and conclusions are simplistic and the report is presented with details lacking. This leads to a substandard presentation with many errors. The novice officer has the ability to function within a competency in a basic manner, but is in need of significant guidance and/or coaching on procedures or concepts, and repeated direction at different times to help further develop knowledge, skills, and abilities.

Deficient – does not have adequate knowledge of the topic under consideration and is in need of remediation, coaching, or other guidance to learn the knowledge, skills, and abilities expected of an administrative fire officer.

Q4 **Management Principles and Organizational Behavior** This competency is guided by the theoretical and practical application of general management principles as it relates to the public sector. Discrete elements in the public sector include industry trends, group dynamics, organizational change, political environment, social factors, and the decision-making process.

Sample Activity: The member is able to *design* a comprehensive department plan to institute a significant change in a program or division.

Q5 How well does the fire service member perform in regards to general management principles and organizational behavior?

- ○ Mastery
- ○ Developing
- ○ Novice
- ○ Deficient
- ○ Not Applicable

Q6 For an administrative fire officer in your department, how important is knowledge of the principles of management and organizational behavior?

- ○ Critically Important
- ○ Moderately Important
- ○ Minimally Important
- ○ Not Important

Q7 In your opinion, where are the general principles of management and organizational behavior best learned?

- ○ Education
- ○ Training
- ○ Experience

Q8 **Leadership** This competency is guided by the principles of leadership. Discrete elements of leadership include different styles of leadership and the adaptation of them in various situations.
Sample Activity: The member will *integrate* the styles of leadership and adapt them in different situations.

Q9 How well does the fire service member perform in regards to the principles of leadership?

- ○ Mastery
- ○ Developing
- ○ Novice
- ○ Deficient
- ○ Not Applicable

Q10 For an administrative fire officer in your department, how important is knowledge of the principles of leadership?

- ○ Critically Important
- ○ Moderately Important
- ○ Minimally Important
- ○ Not Important

Q11 In your opinion, where are the principles of leadership best learned?

- ○ Education
- ○ Training
- ○ Experience

Q12 **Human Resource Management** This competency is guided by the principles of human resource management. Discrete elements of human resource management include all aspects of personnel management, labor/management considerations, mentoring, and the legal environment.
Sample Activity: The member will *judge* the adequacy of a department human resource program through comprehensive evaluation.

Q13 How well does the fire service member perform in regards to the principles of human resource management?

- Mastery
- Developing
- Novice
- Deficient
- Not Applicable

Q14 For an administrative fire officer in your department, how important is knowledge of the principles of human resource management?

- Critically Important
- Moderately Important
- Minimally Important
- Not Important

Q15 In your opinion, where are the principles of human resource management best learned?

- Education
- Training
- Experience

Q16 **Risk Management** This competency is guided by the principles of risk management. Discrete elements of risk management include an occupational safety and health program, community risk assessment, regulatory mandates, and the reduction of risks.
Sample Activity: The member will *judge* the adequacy of a department-wide risk management program through comprehensive evaluation.

Q17 How well does the fire service member perform in regards to the principles of risk management?

- ○ Mastery
- ○ Developing
- ○ Novice
- ○ Deficient
- ○ Not Applicable

Q18 For an administrative fire officer in your department, how important is knowledge of the principles of risk management?

- ○ Critically Important
- ○ Moderately Important
- ○ Minimally Important
- ○ Not Important

Q19 In your opinion, where are the principles of risk management best learned?

- ○ Education
- ○ Training
- ○ Experience

Q20 **Advanced Fire Administration** This competency is guided by the general planning and capability oversight in a fire department. Discrete elements of fire administration include strategic planning, needs assessment, operational capability, and industry trends. Sample Activity: The member will *design* a needs assessment in support of a strategic planning process by incorporating the principles of fire department administrative oversight.

Q21 How well does the fire service member perform in regards to the principles of fire administration?

- Mastery
- Developing
- Novice
- Deficient
- Not Applicable

Q22 For an administrative fire officer in your department, how important is knowledge of the principles of fire administration?

- Critically Important
- Moderately Important
- Minimally Important
- Not Important

Q23 In your opinion, where are the principles of fire administration best learned?

- Education
- Training
- Experience

Q24 **Analytical Approaches** This competency is guided by the principles of research. The discrete element focuses on analytical research in support of decision-making. Sample Activity: The member will *integrate* elements of formal research needed to examine a problem or industry trend, which informs the decision-making process.

Q25 How well does the fire service member perform in regards to the principles of research?

- ○ Mastery
- ○ Developing
- ○ Novice
- ○ Deficient
- ○ Not Applicable

Q26 For an administrative fire officer in your department, how important is knowledge of the principles of research?

- ○ Critically Important
- ○ Moderately Important
- ○ Minimally Important
- ○ Not Important

Q27 In your opinion, where are the principles of research best learned?

- ○ Education
- ○ Training
- ○ Experience

Q28 **Political and Legal Environment** This competency is guided by the political and legal environment of the department. The discrete elements focus on the environments of the politics in the jurisdiction and the federal, state, and local legal mandates that influence department operations.
Sample Activity: The member will *judge* the department's compliance with legal decrees and doctrines and its role in the political system.

Q29 How well does the fire service member perform in regards to the political and legal environment of the department?

- ○ Mastery
- ○ Developing
- ○ Novice
- ○ Deficient
- ○ Not Applicable

Q30 For an administrative fire officer in your department, how important is knowledge of the political and legal environment?

- ○ Critically Important
- ○ Moderately Important
- ○ Minimally Important
- ○ Not Important

Q31 In your opinion, where are the principles of the political and legal environment best learned?

- ○ Education
- ○ Training
- ○ Experience

Q32 **Budgeting** This competency is guided by the general theoretical and practical application of financial management principles. Discrete elements include applying the general principles to a budgeting system, economics, the legal environment, financial reporting, and resource allocation and acquisition.
Sample Activity: The member will *design* a divisional budget using the proper financial reporting process, while outlining revenue sources, resource acquisition and allocation needs.

Q33 How well does the fire service member perform in regards to the principles of budgeting?

- ○ Mastery
- ○ Developing
- ○ Novice
- ○ Deficient
- ○ Not Applicable

Q34 For an administrative fire officer in your department, how important is knowledge of the principles of budgeting?

- ○ Critically Important
- ○ Moderately Important
- ○ Minimally Important
- ○ Not Important

Q35 In your opinion, where are the principles of budgeting best learned?

- ○ Education
- ○ Training
- ○ Experience

Q36 **Ethics** This competency is guided by the theoretical foundation of ethics and the practical application of moral decision making. The discrete element focuses on ethical theory and the adaptation of morality in different situations.
Sample Activity: The member will *judge* ethical theory and duty to act principles into practical application of a moral decision-making process.

Q37 How well does the fire service member perform in regards to the principles of ethics?

- ○ Mastery
- ○ Developing
- ○ Novice
- ○ Deficient
- ○ Not Applicable

Q38 For an administrative fire officer in your department, how important is knowledge of the principles of ethics?

- ○ Critically Important
- ○ Moderately Important
- ○ Minimally Important
- ○ Not Important

Q39 In your opinion, where are the principles of ethics best learned?

- ○ Education
- ○ Training
- ○ Experience

Q40 **Communication** This competency is guided by the principles of communication. The discrete elements focus on oral and written communications in a variety of situations. Sample Activity: The member will *design* an oral and written communication project articulating information in a clear and coherent manner.

Q41 How well does the fire service member perform in regards to written and oral communication?

- Mastery
- Developing
- Novice
- Deficient
- Not Applicable

Q42 For an administrative fire officer in your department, how important is knowledge of written and oral communication?

- Critically Important
- Moderately Important
- Minimally Important
- Not Important

Q43 In your opinion, where are the principles of communication best learned?

- Education
- Training
- Experience

Q44 In your opinion, what is the most appropriate overall rating of the fire service member being assessed?

- Mastery
- Developing
- Novice
- Deficient

Q45 Does the rating in Question 44 accurately capture the overall performance of the fire department member?

- Yes
- No

Q46 What is the department rank of the fire service member being graded?

- Firefighter
- Driver/Operator
- Company Officer
- 2 Bugle Chief
- 3 Bugle Chief
- 4 Bugle Chief
- 5 Bugle Chief

Q47 What is the name of the education institution where the fire service member earned a bachelor's degree? If you do not know, please enter "Unknown." If you prefer not to answer, please enter "None."

Q48 In your opinion, would an assessment process such as in this survey be beneficial or not beneficial in providing professional development guidance to a member in your department?

- ○ Beneficial
- ○ Not Beneficial

Q49 Please provide a brief explanation of your previous answer. If you prefer not to answer, please enter "None."

Q50 What, if any, competencies not listed in this survey, are pertinent in your department and should be listed for the administrative fire officer (Fire Officer III level)? If you prefer not to answer, please enter "None."

Q51 How many years of experience do you have in the fire service?

- ○ 0 to 5 years
- ○ 6 to 10 years
- ○ 11 to 15 years
- ○ 16 to 20 years
- ○ 21 to 25 years
- ○ 26 to 30 years
- ○ More than 30 years

Academic Program Questions

Q52 The following questions should be completed for each student in a cohort in which you are assessing for this study. Each academic program will have a varying number of students used for this assessment. As you will see, the process of completing these questions will go very quickly once you have completed one assessment.

Q53 Which regional accrediting entity recognizes your college? This information is needed for validation purposes only. All identifying information will be kept confidential.

- ○ Accrediting Commission for Community and Junior Colleges (ACCJC), Western Association of Schools and Colleges
- ○ Higher Learning Commission (HLC)
- ○ Middle States Commission on Higher Education (MSCHE)
- ○ Commission on Institutions of Higher Education (CIHE) of the New England Association of Schools and Colleges (NEASC)
- ○ Northwest Commission on Colleges and Universities (NWCCU)
- ○ Southern Association of Colleges and Schools Commission on Colleges (SACSCOC)
- ○ WASC Senior College and University Commission (WSCUC)

Q54 Is your program currently accredited by the International Fire Service Accreditation Congress - Degree Assembly? This information is needed for validation purposes only. All identifying information will be kept confidential.

- ○ Yes
- ○ No

Q55 This study focuses on the assessment of student learning in a fire-related bachelor's degree, which is the recommended level of education for the administrative fire officer (Fire Officer III). Please verify the degree level of your program. Those selecting the associate's or master's degree level will be taken to the end of the survey. Those selecting the bachelor's degree will continue with the survey.

- ○ Associate's degree
- ○ Bachelor's degree
- ○ Master's degree

Q56 As you begin the survey you will notice the speed completion increases with each set of questions. Please select the most appropriate level of performance in each competency.
Mastery – knows which type of analysis or technique to use in creating a plan, report, or proposal in a given situation and puts theory into practice. The background information,

analysis, and conclusions are comprehensive and the report is presented professionally. The mastery officer has the ability to function within a competency without guidance and is therefore considered to be well-developed, functioning with minimal direction from a superior.
Developing – uses basic types of analyses or techniques in creating a plan, report, or proposal. Partially puts theory into practice, but is missing comprehensive knowledge in all aspects of a competency. The background information, analysis, and conclusions are incomplete and lacking details. This leads to a mostly professional report that contains errors. The developing officer has the ability to function within a competency but is in need of mentoring or guidance with procedures or concepts, and moderate direction at different times to help further develop knowledge, skills, and abilities.
Novice – applies one or two basic concepts or techniques in an unsophisticated manner and struggles to put theory into practice. The background information, analysis, and conclusions are simplistic and the report is presented with details lacking. This leads to a substandard presentation with many errors. The novice officer has the ability to function within a competency in a basic manner, but is in need of significant guidance and/or coaching on procedures or concepts, and repeated direction at different times to help further develop knowledge, skills, and abilities.
Deficient – does not have adequate knowledge of the topic under consideration and is in need of remediation, coaching, or other guidance to learn the knowledge, skills, and abilities expected of an administrative fire officer.

Q57 **Management Principles and Organizational Behavior** This competency is guided by the theoretical and practical application of general management principles as it relates to the public sector. Discrete elements in the public sector include industry trends, group dynamics, organizational change, political environment, social factors, and the decision-making process.
Sample Activity: The student is able to *design* a comprehensive department plan to institute a significant change in a program or division.

Q58 How well does the student perform in regards to general management principles and organizational behavior?

- ○ Mastery
- ○ Developing
- ○ Novice
- ○ Deficient
- ○ Not Applicable

Q59 For a student in your program, how important is knowledge of the principles of management and organizational behavior?

- Critically Important
- Moderately Important
- Minimally Important
- Not Important

Q60 Where are the general principles of management and organizational behavior taught in your program?

- Education
- Training
- Experience

Q61 **Leadership** This competency is guided by the principles of leadership. Discrete elements of leadership include different styles of leadership and the adaptation of them in various situations.
Sample Activity: The student will *integrate* the styles of leadership and adapt them in different situations.

Q62 How well does the student perform in regards to leadership?

- Mastery
- Developing
- Novice
- Deficient
- Not Applicable

Q63 For a student in your program, how important is knowledge of the principles of leadership?

- Critically Important
- Moderately Important
- Minimally Important
- Not Important

Q64 Where are the principles of leadership taught in your program?

- Core Course
- Elective Course
- General Education Course
- Not in Curriculum

Q65 **Human Resource Management** This competency is guided by the principles of human resource management. Discrete elements of human resource management include all aspects of personnel management, labor/management considerations, mentoring, and the legal environment.
Sample Activity: The student will *judge* the adequacy of a department human resource program through comprehensive evaluation.

Q66 How well does the student perform in regards to human resource management?

- Mastery
- Developing
- Novice
- Deficient
- Not Applicable

Q67 For a student in your program, how important is knowledge of human resource management?

- Critically Important
- Moderately Important
- Minimally Important
- Not Important

Q68 Where are the principles of human resource management taught in your program?

- Core Course
- Elective Course
- General Education Course
- Not in Curriculum

Q69 **Risk Management** This competency is guided by the principles of risk management. Discrete elements of risk management include an occupational safety and health program, community risk assessment, regulatory mandates, and the reduction of risks.
Sample Activity: The student will *judge* the adequacy of a department-wide risk management program through comprehensive evaluation.

Q70 How well does the student perform in regards to risk management?

- Mastery
- Developing
- Novice
- Deficient
- Not Applicable

Q71 For the student in your program, how important is knowledge of the principles of risk management?

- Critically Important
- Moderately Important
- Minimally Important
- Not Important

Q72 Where are the principles of risk management taught in your program?

- Core Course
- Elective Course
- General Education Course
- Not in Curriculum

Q73 **Advanced Fire Administration** This competency is guided by the general planning and capability oversight in a fire department. Discrete elements of fire administration include strategic planning, needs assessment, operational capability, and industry trends. Sample Activity: The student will *design* a needs assessment in support of a strategic planning process by incorporating the principles of fire department administrative oversight.

Q74 How well does the student perform in regards to the principles of fire administration?

- Mastery
- Developing
- Novice
- Deficient
- Not Applicable

Q75 For a student in your program, how important is knowledge of the principles of fire administration?

- Critically Important
- Moderately Important
- Minimally Important
- Not Important

Q76 Where are the principles of fire administration taught in your program?

- Core Course
- Elective Course
- General Education Course
- Not in Curriculum

Q77 **Analytical Approaches** This competency is guided by the principles of research. The discrete element focuses on analytical research in support of decision-making. Sample Activity: The student will *integrate* elements of formal research needed to examine a problem or industry trend, which informs the decision-making process.

Q78 How well does the student perform in regards to the principles of research?

- Mastery
- Developing
- Novice
- Deficient
- Not Applicable

Q79 For a student in your program, how important is knowledge of the principles of research?

- Critically Important
- Moderately Important
- Minimally Important
- Not Important

Q80 Where are the principles of research taught in your program?

- Core Course
- Elective Course
- General Education Course
- Not in Curriculum

Q81 **Political and Legal Environment** This competency is guided by the political and legal environment of the department. The discrete elements focus on the environments of the politics in the jurisdiction and the federal, state, and local legal mandates that influence department operations.
Sample Activity: The student will *judge* the department's compliance with legal decrees and doctrines and its role in the political system.

Q82 How well does the student perform in regards to knowledge of the political and legal environment in the fire service?

- Mastery
- Developing
- Novice
- Deficient
- Not Applicable

Q83 For a student in your program, how important is knowledge of the political and legal environment?

- ○ Critically Important
- ○ Moderately Important
- ○ Minimally Important
- ○ Not Important

Q84 Where are the principles of the political and legal environment taught in your program?

- ○ Core Course
- ○ Elective Course
- ○ General Education Course
- ○ Not in Curriculum

Q85 **Budgeting** This competency is guided by the general theoretical and practical application of financial management principles. Discrete elements include applying the general principles to a budgeting system, economics, the legal environment, financial reporting, and resource allocation and acquisition.
Sample Activity: The student will *design* a divisional budget using the proper financial reporting process, while outlining revenue sources, resource acquisition and allocation needs.

Q86 How well does the student perform in regards to the principles of budgeting?

- ○ Mastery
- ○ Developing
- ○ Novice
- ○ Deficient
- ○ Not Applicable

Q87 For a student in your program, how important is knowledge of the principles of budgeting?

- Critically Important
- Moderately Important
- Minimally Important
- Not Important

Q88 Where are the principles of budgeting taught in your program?

- Core Course
- Elective Course
- General Education
- Not in Curriculum

Q89 **Ethics** This competency is guided by the theoretical foundation of ethics and the practical application of moral decision making. The discrete element focuses on ethical theory and the adaptation of morality in different situations.
Sample Activity: The student will *judge* ethical theory and duty to act principles into practical application of a moral decision-making process.

Q90 How well does the student perform in regards to the principles of ethics?

- Mastery
- Developing
- Novice
- Deficient
- Not Applicable

Q91 For a student in your program, how important is knowledge of the principles of ethics?

- Critically Important
- Moderately Important
- Minimally Important
- Not Important

Q92 Where are the principles of ethics taught in your program?

- Core Course
- Elective Course
- General Education Course
- Not in Curriculum

Q93 **Communication** This competency is guided by the principles of communication. The discrete elements focus on oral and written communications in a variety of situations. Sample Activity: The student will *design* an oral and written communication project articulating information in a clear and coherent manner.

Q94 How well does the student perform in regards to written and oral communication?

- Mastery
- Developing
- Novice
- Deficient
- Not Applicable

Q95 For a student in your program, how important is knowledge of written and oral communication?

- Critically Important
- Moderately Important
- Minimally Important
- Not Important

Q96 Where are the principles of communications taught in your program?

- Core Course
- Elective Course
- General Education
- Not in Curriculum

Q97 In your opinion, what is the most appropriate overall rating of the student being assessed?

- Mastery
- Developing
- Novice
- Deficient

Q98 Does the rating in Question 97 accurately capture the overall performance of the student?

- Yes
- No

Q99 What, if any, competencies not listed in this survey, are pertinent in your program and should be listed for the bachelor degrees? If you prefer not to answer, please enter "None."

Q100 In your opinion, would an assessment process such as in this survey be beneficial or not beneficial in providing educational guidance to a student in your program?

- Beneficial
- Not Beneficial

Q101 Please provide a brief explanation of your previous answer. If you prefer not to answer, please enter "None."

APPENDIX B: ORIGINAL QUESTIONNAIRE DATA

Mgmt					Leadership					HRM					Risk					Fire Admin					Research					Political/ Legal					Budgeting					Ethics					Comm				
4	3	2	1	0	4	3	2	1	0	4	3	2	1	0	4	3	2	1	0	4	3	2	1	0	4	3	2	1	0	4	3	2	1	0	4	3	2	1	0	4	3	2	1	0	4	3	2	1	0
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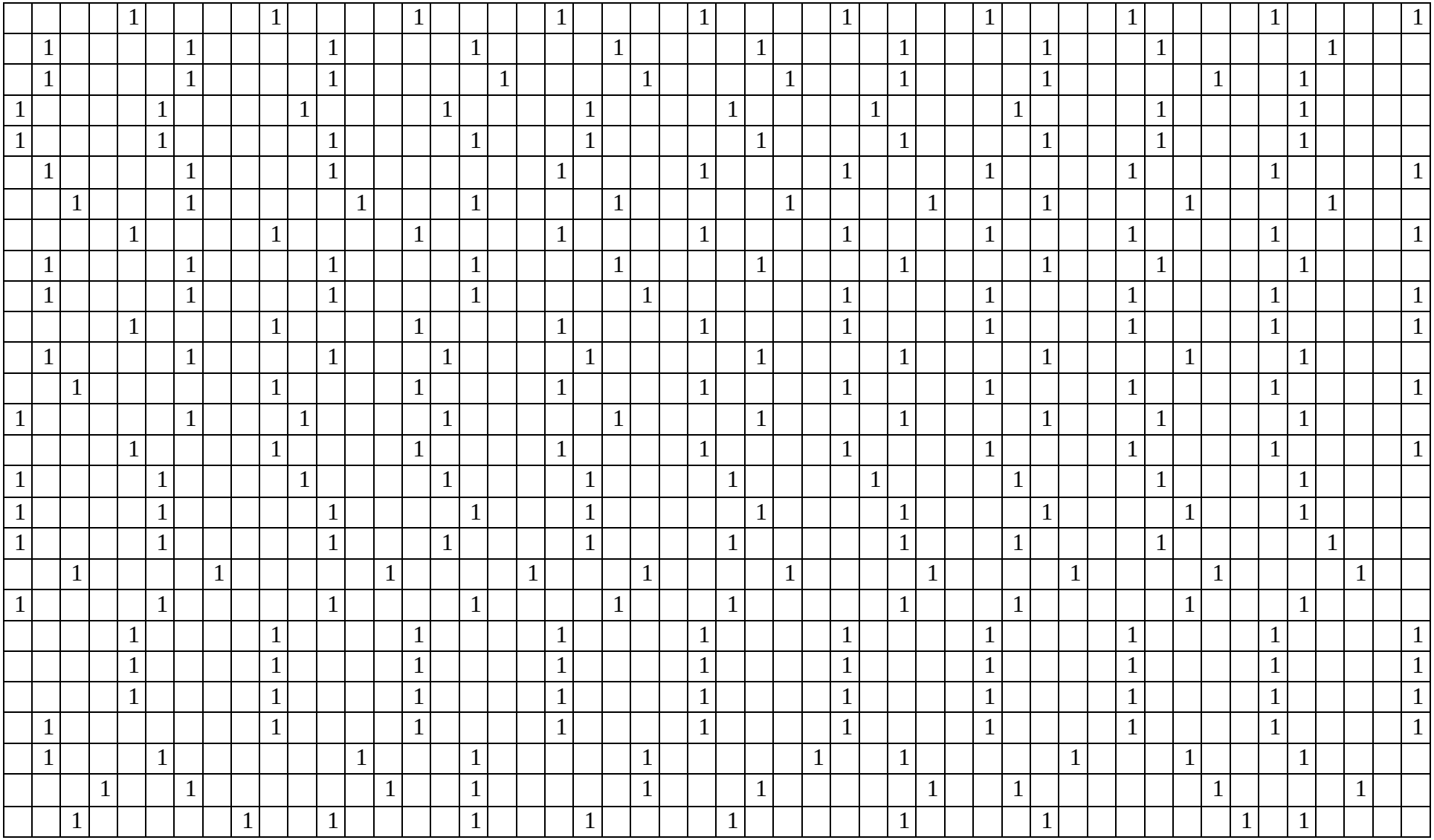

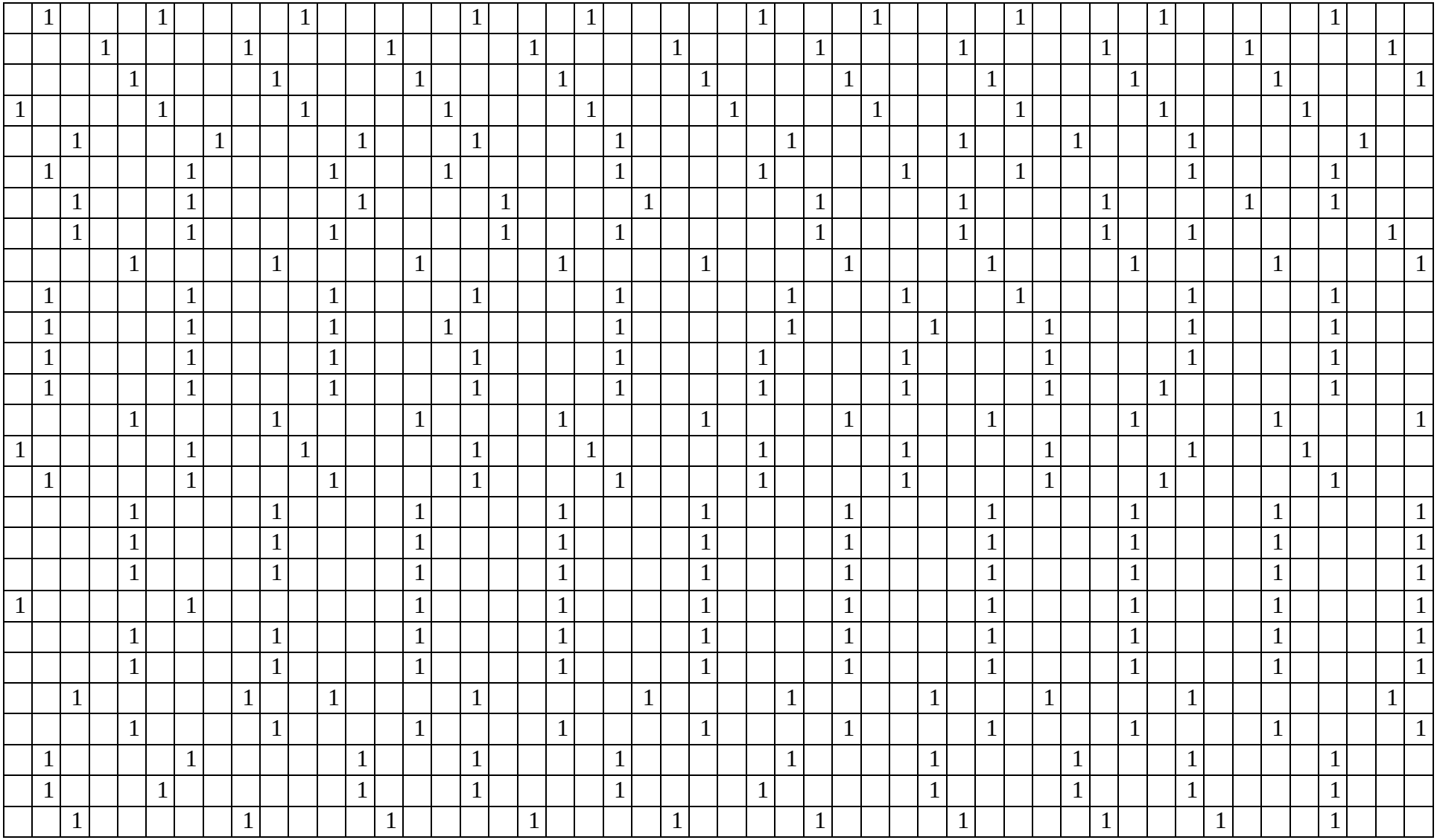

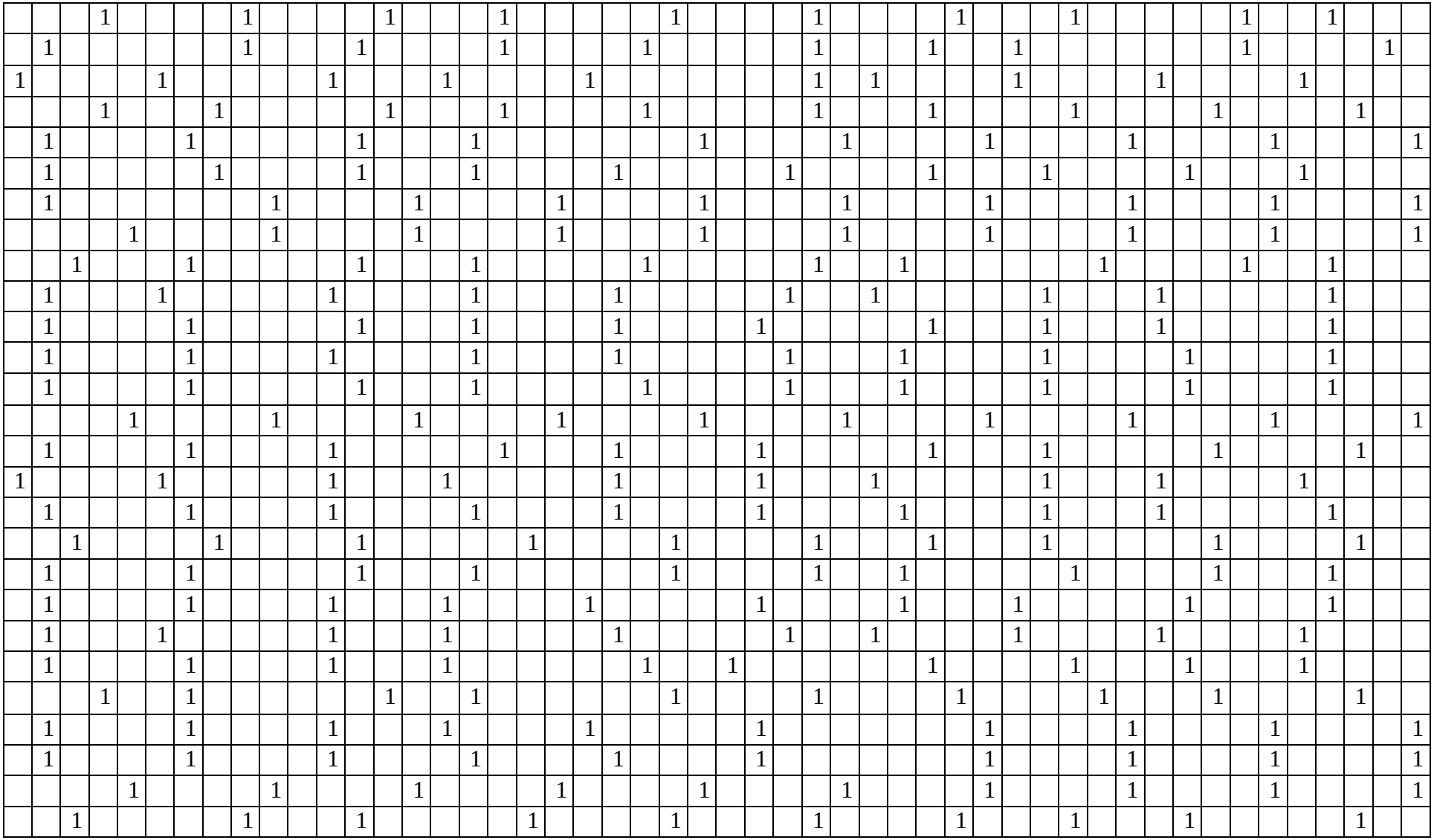

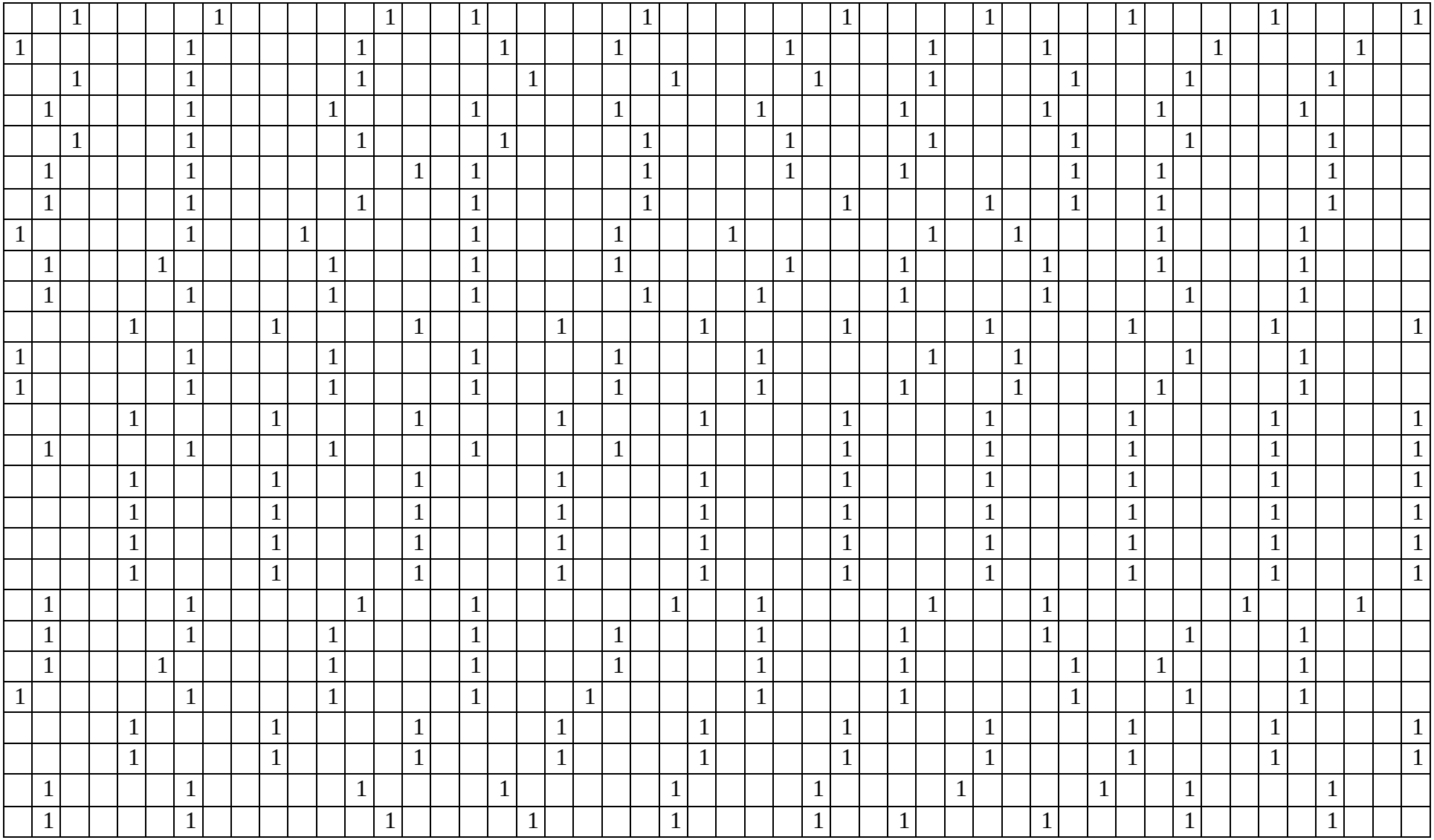

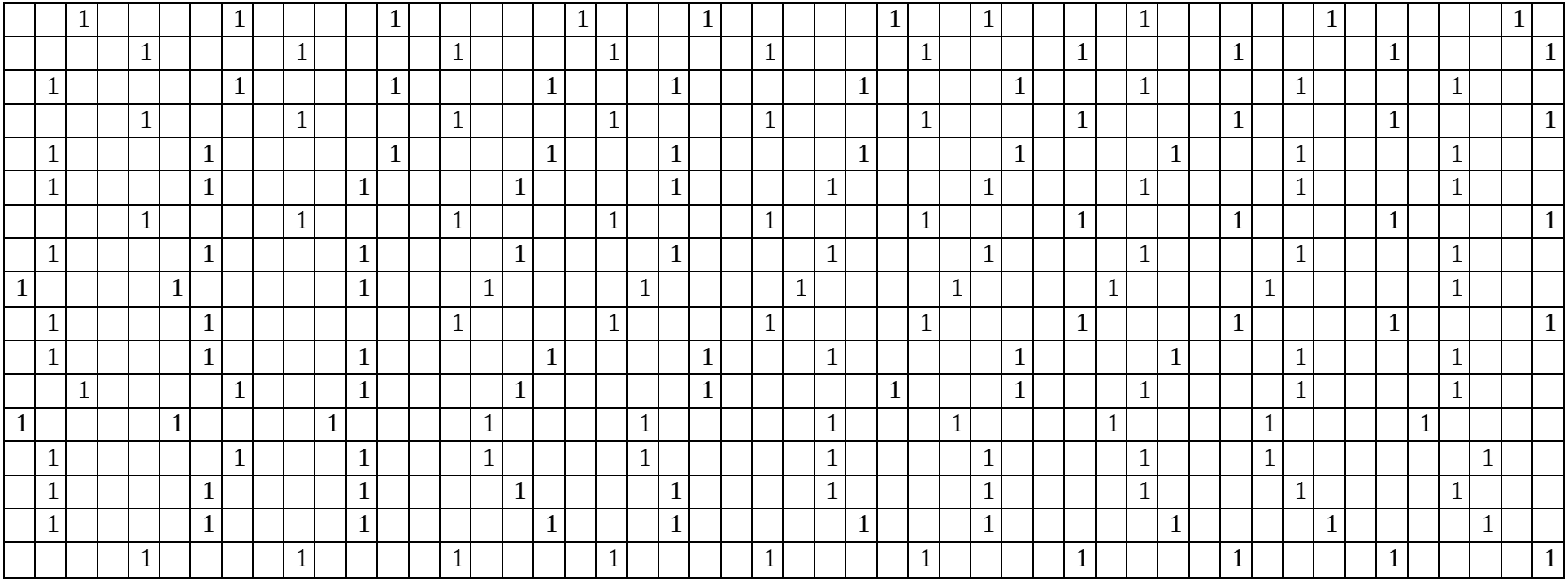

APPENDIX C: WEIGHTED SCORES AT 2-0 AND ERROR OF REPRODUCIBILITY

Mgmt					Leadership					HRM					Risk Mgmt					Fire Admin					Research					Political/ Legal					Budgeting					Ethics					Comm				
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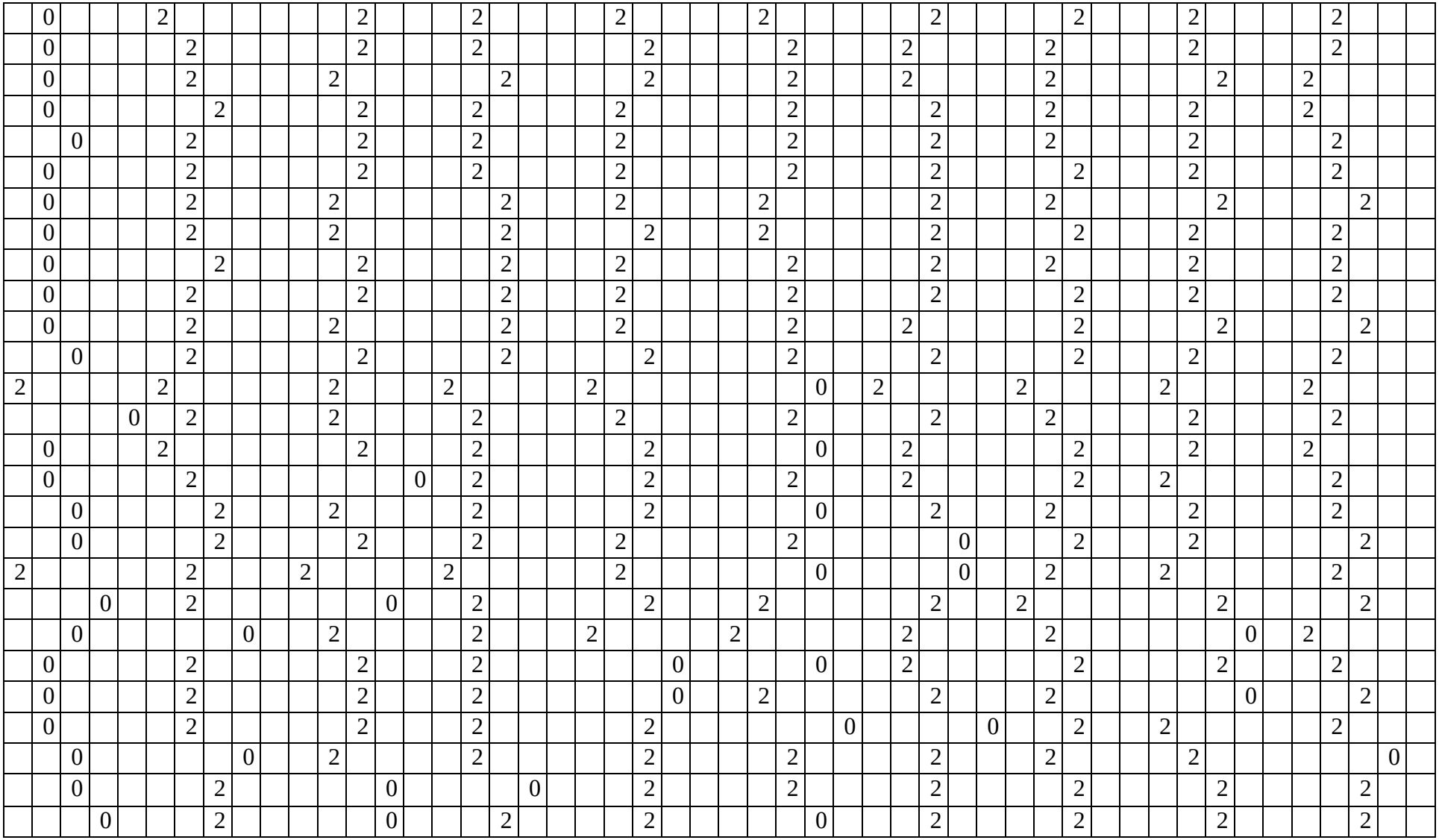

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APPENDIX D: HORIZONTAL DATA ANALYSIS

Mastery					
Score	M	D	N	D	NA
40	10	0	0	0	0
40	10	0	0	0	0
40	10	0	0	0	0
39	9	1	0	0	0
38	8	2	0	0	0
38	8	2	0	0	0
36	6	4	0	0	0
36	8	1	0	1	0
36	6	4	0	0	0
35	5	5	0	0	0
35	5	5	0	0	0
35	6	3	1	0	0
34	4	6	0	0	0
32	3	6	1	0	0
32	2	8	0	0	0
32	3	6	1	0	0
18	0	2	4	4	0

Developing					
Score	M	D	N	D	NA
37	7	3	0	0	0
35	6	3	1	0	0
35	5	5	0	0	0
34	4	6	0	0	0
34	4	6	0	0	0
33	3	7	0	0	0
33	3	7	0	0	0
32	3	6	1	0	0
32	3	6	1	0	0
32	3	6	1	0	0
32	2	8	0	0	0
32	2	8	0	0	0
32	2	8	0	0	0
31	1	9	0	0	0
31	1	9	0	0	0
31	1	9	0	0	0
31	1	9	0	0	0
31	1	9	0	0	0

31	3	5	2	0	0
30	4	4	0	2	0
30	1	8	1	0	0
30	0	10	0	0	0
30	3	4	3	0	0
30	1	8	1	0	0
30	0	10	0	0	0
30	0	10	0	0	0
30	0	10	0	0	0
29	1	7	2	0	0
29	1	7	2	0	0
29	0	9	1	0	0
28	3	4	1	2	0
28	1	6	3	0	0
27	1	5	4	0	0
27	2	4	3	1	0
27	1	5	4	0	0
27	0	7	3	0	0
26	0	6	4	0	0
26	0	6	4	0	0

26	0	6	4	0	0
26	0	6	4	0	0
25	0	7	2	0	1
25	1	5	3	0	1
25	0	5	5	0	0
25	0	5	5	0	0
25	0	5	5	0	0
24	0	5	4	1	0
23	0	5	3	2	0
23	0	3	7	0	0
Developing (cont.)					
23	0	5	3	2	0
22	0	3	6	1	0
22	1	4	3	0	2
22	0	6	0	4	0
21	0	4	3	3	0
20	0	4	2	4	0
20	0	3	4	3	0
20	0	4	2	4	0
18	0	0	8	2	0

Novice					
Score	M	D	N	D	NA
25	1	3	6	0	0
23	1	3	4	1	0
22	0	4	4	2	0
19	1	1	4	4	0

19	0	2	5	3	0
17	0	0	7	3	0
16	0	1	4	5	0

Deficient					
Score	M	D	N	D	NA
18	0	1	6	3	0
14	0	1	2	7	0
14	0	1	2	7	0
10	0	0	0	10	0

APPENDIX E: IRB APPROVAL LETTERS

Oklahoma State University Institutional Review Board

Date:	Wednesday, June 21, 2017
IRB Application No	AS1755
Proposal Title:	Validation of competencies at the level of Fire Officer III at the conclusion of a bachelor's degree program.
Reviewed and Processed as:	Exempt

Status Recommended by Reviewer(s): Approved Protocol Expires: 6/20/2020

Principal Investigator(s):

Lynn Wojcik
Stillwater, OK 74078

William J Focht
228 Murray
Stillwater, OK 74078

The IRB application referenced above has been approved. It is the judgment of the reviewers that the rights and welfare of individuals who may be asked to participate in this study will be respected, and that the research will be conducted in a manner consistent with the IRB requirements as outlined in section 45 CFR 46.

☐ The final versions of any printed recruitment, consent and assent documents bearing the IRB approval stamp are attached to this letter. These are the versions that must be used during the study.

As Principal Investigator, it is your responsibility to do the following:

1. Conduct this study exactly as it has been approved. Any modifications to the research protocol must be submitted with the appropriate signatures for IRB approval. Protocol modifications requiring approval may include changes to the title, PI advisor, funding status or sponsor, subject population composition or size, recruitment, inclusion/exclusion criteria, research site, research procedures and consent/assent process or forms.
2. Submit a request for continuation if the study extends beyond the approval period. This continuation must receive IRB review and approval before the research can continue.
3. Report any adverse events to the IRB Chair promptly. Adverse events are those which are unanticipated and impact the subjects during the course of the research; and
4. Notify the IRB office in writing when your research project is complete.

Please note that approved protocols are subject to monitoring by the IRB and that the IRB office has the authority to inspect research records associated with this protocol at any time. If you have questions about the IRB procedures or need any assistance from the Board, please contact Dawnett Watkins 219 Scott Hall (phone: 405-744-5700, dawnett.watkins@okstate.edu).

Sincerely,

Hugh Crethar, Chair
Institutional Review Board

Oklahoma State University Institutional Review Board

Date:	07/30/2018
Application Number:	AS-18-38
Proposal Title:	In Pursuit of Professionalism: An Exploration of Academic Assessment of Fire Officer Competencies
Principal Investigator:	Lynn Wojcik
Co-Investigator(s):	
Faculty Adviser:	Haley Murphy
Project Coordinator:	
Research Assistant(s):	

Status Recommended by Reviewer(s): Approved
Approval Date: **04/23/2018**
Expiration Date:

The requested modification to this IRB protocol has been approved. Please note that the original expiration date of the protocol has not changed.

Modifications Approved:
Modifications Approved: Add recruitment of fire chiefs or designee across the U.S., recruitment will be done via email. Remove interview and add anonymous survey. Increase number of participants to 1,500.

The IRB office MUST be notified when a project is complete or you are no longer affiliated with Oklahoma State University.

All approved projects are subject to monitoring by the IRB.

The final versions of any recruitment, consent and assent documents bearing the IRB approval stamp are attached. These are the versions that must be used during the study.

Sincerely,

Hugh Crethar, Chair
Institutional Review Board

VITA

Lynn Marie Wojcik

Candidate for the Degree of

Doctor of Philosophy

Dissertation: IN PURSUIT OF PROFESSIONALISM: AN EXPLORATION OF FIRE OFFICER COMPETENCY ASSESSMENT

Major Field: Fire and Emergency Management Administration

Biographical:

Education:

Completed the requirements for the Doctor of Philosophy in Fire and Emergency Management Administration at Oklahoma State University, Stillwater, Oklahoma in May, 2019.

Completed the requirements for the Master of Science in Technology in Fire Service Administration at Arizona State University, Mesa, Arizona in 2011.

Completed the requirements for the Bachelor of Applied Science in Fire Service Management at Arizona State University, Mesa, Arizona in 2008.

Experience:

City of Tucson. January 2019 to present.
Tucson, Arizona.

Oklahoma State University – Oklahoma City. January 2014 to December 2018.
Oklahoma City, Oklahoma.

City of Yuma Fire Department. January 1990 to January 2013.
Yuma, Arizona.

Professional Memberships:

International Association of Women in Fire and Emergency Services, Member