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The Evidence Does Not Lie

**A Forensic Investigation Program to Bridge the Gaps Between
Crime Scene Investigation and Forensic Science**

A Dissertation
Presented for the
Doctor of Education Degree
The University of Tennessee, Knoxville

Jacqueline Trinkle Fish
December 2004

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Dedication

This dissertation is dedicated to my loving and supportive husband, Paul, whose confidence inspired me. Your willingness to assume the responsibility for our family life maintaining a sense of normalcy over the course of my research made this all possible. Thank you for insisting I continue my work despite the challenges we encountered over the past year. Also, to our children, Emily and Jonathon, your patience and understanding helped remind me daily that there would be a conclusion to my studies. Thank you, I love you all very much.

In Memory

H. L. “Jack” Trinkle, my father, who is smiling down on us from above.

Lucy Ross, the first National Forensic Academy graduate to make the ultimate sacrifice as a crime scene investigator.

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Abstract

There is a heightened public awareness of the importance of forensic science to crime scene investigation. This study examined current graduate programs in forensic science and criminal justice in the United States to determine if higher education provides curricula that meets the needs of crime scene investigators.

Using data collected from an online questionnaire, interviews, and a literature review, the researcher examined the perceptions of 51 crime scene investigators and practitioners affiliated with the National Forensic Academy at The University of Tennessee. The data gathered was used to identify and rank the skills most important for accurate processing and collection of physical evidence at the crime scene. Practitioners were also asked to determine course topics that should be integrated in a multi-disciplinary graduate forensic investigation program.

There are only four universities that offer graduate programs that have acknowledged the need for a program designed for crime scene investigators. An analysis of the four programs revealed that less than half of the knowledge, skills, and abilities identified by practitioners as essential to the performance of their job responsibilities have been incorporated into current curricula. The conclusion is that there exists a gap between the disciplines of criminal justice and forensic science that has not been adequately addressed by graduate programs.

The implementation of a graduate forensic investigation program is suggested as a means of bridging the existing gap between the disciplines. As a result of the research, a model curriculum is proposed in the dissertation that integrates technological advances in

forensic sciences and provides the knowledge, skills, and abilities to meet the needs of crime scene investigators.

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Chapter 1

Introduction

Background of the Problem

“Our Day Begins When Your Day Ends.”

Displayed in police agencies across the nation, this sign voices the commitment of law enforcement authorities to pursue all legal avenues for identifying and collecting the evidence that is used to convict the guilty and clear the innocent in America’s criminal justice system. Reconstructing the events surrounding a person’s death challenges detectives and crime scene investigators to use many skills to seek justice for the victims.

The public assumes the most advanced technology available is used to identify, arrest, and convict perpetrators. This “CSI effect,” (a reference to the popular TV crime drama) according to Captain Chris Beattie of the Los Angeles County Scientific Services Bureau, has created unreasonable expectations for the victims of crime, for students looking to enter the field, and for juries that hear criminal cases (Lovgren, 2004).

As the coinage “CSI effect” demonstrates, the public’s impression of the criminal justice system comes largely from media reports (Chermak, 2003). As Surette (1992) notes, people develop many of their individual perceptions of the world from information provided by the media as well as movies and television promote (Nikoli, Hendricks, C., Hendricks, J., and Osgood, 2003). Although these perceptions may not be accurate, they often become the primary source of knowledge regarding the American system of justice (Joseph, 2002).

Television has glamorized police officers, prosecutors, forensic scientists and medical examiners, creating an increased demand for education and training in the recognition, identification, individualization, and evaluation of physical evidence (National Institute of Justice, 2004). Some of the technology that allows TV investigators to solve crimes in 52 minutes does exist—but the speed of the analysis presented in such fictionalized accounts is not realistic. For example, though the Automated Fingerprint Identification System on CSI instantly provides fingerprint identifications that include the name, address and photograph of the suspect, in reality other information comes from numerous databases and must actually be confirmed by a human fingerprint examiner (Lovgren, 2004).

The media have also helped the public recognize the of value scientific evidence, as has been demonstrated by an increase in enrollment in forensic science and criminal justice programs in the nation's colleges and universities: in 2003, 180 applicants vied for 20 positions in Michigan State University's forensic science program (Lovgren, 2004).

The popularity of television shows featuring police, medical examiners, prosecutors, and forensic scientists creates a popular perception that crime scene investigators are multi-disciplinary experts with unlimited knowledge and access to endless resources. However, this perception is largely erroneous. According to my study of 290 graduate forensic science and criminal justice programs websites in the United States, criminal justice curricula do not often include instructional components designed to teach students to effectively apply scientific knowledge to the crime scene.

Furthermore, forensic science courses are not generally integrated into the curricula offered in social science programs such as criminology and administration of justice.

This gap between the disciplines must be addressed by higher education. If investigators possessed more knowledge about the various forensic science disciplines, they might be able to use their enhanced skills to solve crimes more quickly and reliably. When collecting and submitting evidence to the crime laboratory for analysis, evidence technicians should be able to rely on scientifically-proven protocol, including those utilized in disciplines such as forensic anthropology. This would contribute to rigor and standardization while enhancing the potential for conclusive laboratory analysis (Burns, 2003).

Though technological advances have led to more arrests and successful prosecutions, my research indicates that college and university programs have not assimilated technological advances into their curricula. Course content and learning outcomes have not incorporated the new knowledge and there is a disconnect between the disciplines of forensic science and criminal justice as this dissertation will show. Existing programs fail to meet the needs of practitioners and do not address the challenges of today's highly complex criminal investigations.

Law enforcement officials and prosecutors realize the critical need for forensic evidence to be properly identified, documented, collected, and submitted for analysis to the crime laboratory. The U.S. Presidential Initiative of 2003 mandates that several law enforcement agencies be selected by the National Institute of Justice to receive funding to incorporate evidence collection modules into their officer training programs and that

prosecutors will be trained to enhance their ability to present the evidence to a judge and jury (National Institute of Justice, 2003a).

However, my survey of websites of 290 graduate programs in forensic science and criminal justice suggests that our nation's universities are failing to provide a competency-based curriculum that can allow graduate students to develop the skills and knowledge they need in order to make use of these state-of-the-art advances in forensic science. My findings led me to conclude that the sophistication of today's criminals have created a need for a new breed of practitioner, a *forensic investigator*, who is highly educated in scientific knowledge and able to apply the latest criminal investigative techniques at the scene of a crime.

There is an increased public awareness of the value of forensic science to the criminal justice system (National Institute of Justice, 2004). Participants in this program will complete a graduate educational program that is designed to provide the knowledge, skills, and abilities required of a crime scene investigator. Completion of the program will require students to demonstrate proficiency of the skills necessary to accurately process a crime scene.

Ever since the introduction of the fictional character Sherlock Holmes by Sir Arthur Conan Doyle in 1887, the public has been aware of the value of physical evidence in solving crimes. Citizens in contemporary society rely on science to answer questions. Scientific inquiry provides a set of rules and methods for validating the answers obtained, and leads to new discoveries and technological advances. Johnson, Rettig, Scott and Garrison (1999) assert that "technology is a product of science" that can be applied to

various tasks. Forensic scientists use standard protocols and advanced technology to answer questions related to matters of law in the lab.

This dissertation is focused on the need for higher education to offer a program that brings technological advances out of the lab and employs them at the scene of the crimes. Modern crime scene investigators should be educated to synthesize information at the scene of a crime, to perform the proper procedures, to follow established protocols, document their actions, and to provide justification for those actions in testimony to a court of law. My research revealed that existing graduate programs in forensic science and criminal justice have not adapted their existing curricula to meet these changing demands.

To clarify, the main components of the two disciplines under study here are:

Forensic Science—applied sciences such as Chemistry, Biology, Anthropology, Osteology, Pathology, Toxicology, and Serology courses that generally lead to laboratory analysis-type careers.

Criminal Justice—a social science discipline consisting mainly of courses such as Administration of Justice, Research Methodologies, Criminal Procedures, Theories of the Causes of Crime, Victimology, and studies of the three components of the Criminal Justice System which are police, courts, and corrections.

Because of my educational and professional background, I have an in-depth understanding of the ever-widening chasm between criminal justice and forensic science graduate programs. This disciplinary gap has developed in a time when the criminal

element continues to encroach on society. Having been a student, a practitioner, and working now as an instructional designer for The University of Tennessee's National Forensic Academy, my interest in forensics spans twenty-five years. I feel there is an urgent need for an innovative program that will prepare crime scene investigators to employ state-of-the-art technologies and a scientific knowledge base.

The research below identifies the skills a crime scene investigator must possess, examines existing graduate level programs, and defines the disconnect that exists between the required skills and available courses. The capstone of this study is the development of a proposed model curriculum that can ensure that the investigators working with victims of future crimes have access to the most comprehensive and integrated courses available in higher education.

Definition of Terms

Forensic science and criminal justice encompass a wide variety of specialties. A mini-glossary of terminology is provided to clarify the meanings for the reader. These definitions have been synthesized from a review of the literature and discussions with faculty members and subject matter experts.

- Civilian Employee

A person within an agency that does not perform the tasks of a certified police officer, that is, the individual does not have powers of arrest.

- Crime Scene Investigator

A law enforcement employee charged with the responsibility of processing a location to identify, preserve, and collect physical evidence indicating that a crime

has been committed. This term is used interchangeably with evidence technician by some agencies and in this dissertation. Crime scene investigators may be either sworn officers or civilian employees.

- **Criminal Investigation**

The official inquiry conducted by a law enforcement agency into an alleged crime. Either a victim of a crime or a police officer may initiate an investigation.

- **Criminal Justice Programs**

Courses of study that focus on the administration of justice in the three component areas of the criminal justice system, which are the police, courts, and corrections. In the United States, many criminal justice programs are housed within the sociology departments. Most courses are grounded in social science theory, and focus on agency administration, leadership, research methodology, problem solving, and the causes of crime.

- **Forensic Investigation**

A multi-disciplinary program of study combining the practical aspects of criminal justice education with an introductory level of applied science courses. This kind of program provides the knowledge, skills, and abilities necessary for crime scene investigators to perform their professional responsibilities in the investigation of a crime scene.

- **Forensic Science Programs**

Applied sciences that are used in the judicial process to relate scientific facts to legal problems. Disciplines included in forensic science programs include:

anthropology, chemistry, biology, laboratory analysis, physics, pathology, osteology, and other applied sciences.

- **Medicolegal**

The capability of medical science to assist in legal matters, as for example, the use of a forensic anthropologist's skills to identify skeletal remains.

- **National Forensic Academy (NFA)**

The nation's only in-residence training program developed exclusively for crime scene investigators. The NFA is based at The University of Tennessee's Law Enforcement Innovation Center. The program comprises 180 classroom hours and 220 hours of practical exercises involving the location, identification, collection and preservation of evidentiary materials. Nationally-recognized for academic excellence and applicability, the program draws students from local, state, and federal agencies across the United States.

- **Physical Evidence**

Consists of any and all objects that can be used to determine that a crime has been committed. Physical evidence establishes a link among the alleged perpetrators, the victims, and the crime scenes.

- **Trace Evidence**

Small or microscopic types of material that transfer between people, places, or things. Examples of trace evidence include fibers, hair, glass, and soil.

- Sworn Officer

A certified police officer that has taken an oath to uphold the constitution and fairly enforce the law. Sworn employees have the power to arrest a suspected (alleged) criminal.

Statement of the Problem

Laci and Conner Peterson, Chandra Levy, Jon Benét Ramsey, and Nicole Simpson are victims who received worldwide publicity for things they didn't do. But these victims all have one thing in common—forensic evidence that could link their attackers to them. Police officers accept the responsibility for protecting and serving the public, but for these victims, these responsibilities of law enforcers increased greatly post mortem.

Until these murders hit the media, the only type of forensic evidence commonly recognized by the public was the fingerprint. Police departments employed a designated agency photographer, and a few detectives were issued fingerprint brushes and powder and sent forth to solve crimes with little or no formal training on crime scene protocols. Professional evidence technicians were found only in large metropolitan departments. In the case of Nicole Simpson, even the presence of these “professionals” did not lead to a murder conviction, but rather opened the public's eyes to the potential of unethical evidence custodians contaminating existing physical evidence and rendering it inadmissible in court.

Locard's Exchange Principle states that when two objects come into contact with the other, each of these objects leaves or transfers particles to the other (Nickolls, 1956).

Highly-publicized crimes such as the Simpson, Goldman, Ramsey, and Peterson murders have heightened the public's awareness of the existence and importance of physical and trace evidence. The importance of the integrity and credibility of crime scene investigators has been elevated to a higher standard in the public perception by these highly-publicized crimes.

The criminal justice system faces increased pressure from the public to employ more sophisticated scientific analysis in an effort to identify perpetrators. Law enforcement agencies are beginning to recognize the need for professionals skilled in the art of identifying, collecting and preserving physical evidence at crime scenes.

National accreditation standards require specialized training and ongoing educational opportunities in order for agencies to achieve and maintain accreditation (Commission on Accreditation for Law Enforcement Agencies, 2004). As current practitioners begin to retire, their position descriptions are being redefined so as to attract applicants already possessing the credentials necessary to perform the job requirements (National Institute of Justice, 2004).

An analogy to the practice of medicine can help to illuminate the problem: twenty-five years ago there were no laparoscopic surgeons; there were only surgeons trained to make large incisions. Medical schools have responded to technological advances like this one by redesigning curricula and protocols to meet the demands of today's patients by educating physicians and surgeons in modern medical techniques. (Association of American Medical Colleges, 2003). Forensic science and criminal justice programs must also respond to the rapid development of new technologies, advances in

the scientific knowledge base, and societal expectations by offering an articulated curriculum of standard methodologies.

Progressive law enforcement agencies have implemented educational incentive programs designed to encourage officers to complete both undergraduate and graduate degrees. These incentive programs may include tuition reimbursement and an annual stipend recognizing the officer's higher level of knowledge, skills, and abilities.

A forensic investigation program may attract students who were reluctant to pursue a theoretical based graduate degree such as criminal justice, as well as those who had not planned to pursue a graduate degree. The financial incentive, coupled with a higher degree of professional credibility are two benefits that should be factored when considering implementation of a forensic investigation program.

Purpose of the Study

Institutions of higher education have an obligation to respond to the disconnect in the knowledge base between the disciplines of forensic science and criminal justice by offering practical applications and scientifically-based curricula for law enforcement professionals. The purpose of this dissertation research is to

- Determine the skills and expertise required for competency as crime scene investigators.
- Ascertain the spectrum of courses currently included in the curricula.
- Compare the skills identified by the practitioners to the content of current programs.

- Based on findings, address the deficiencies in existing programs by proposing an integrated model curriculum that defines and addresses the educational and professional needs of crime scene investigators seeking a master's degree in forensic investigation.

The proposed academic curriculum incorporates forensic science, technology, and modern investigative techniques and provides the appropriate academic foundation for a multidisciplinary master's program.

The research questions addressed during this study are:

1. What skills do crime scene investigators believe they need to do their jobs?
2. What skills do crime scene investigators expect to gain from an idealized masters program?
3. What courses do crime scene investigators believe will help them develop the skills they need to do their jobs more effectively?
4. What are the differences between the crime scene investigator's idealized masters program and current programs in forensic science and criminal justice?

Significance of the Study

The National Institute of Justice was established with the mission to encourage policy-relevant research that might be useful in preventing or reducing crime (Hagan, 2000). NIJ Director James Stewart (1983) stated "The fact remains that those charged with administering the criminal justice system are forced by the flow of events to make decisions, to implement new policies and alter operations often without the benefit of the best available knowledge."

Twenty-one years later it is time to make the best knowledge available to practitioners by providing a focused and integrated curriculum for the new breed of forensic investigator. It is important to survey practitioners and educators to ascertain their educational needs. As part of this research I have conducted a survey that defines the level of skills required for accurate crime scene processing. It further identifies the level of skills that should be attained during completion of a graduate course in forensic investigation and the topics considered by practitioners to be relevant to their training. Graduate programs in forensic science and criminal justice across the nation will be observed to determine if the program of study meets the needs of crime scene investigators. Finally, I propose a model curriculum that integrates the range of scientific knowledge into a practitioner-oriented program. The model exemplifies how higher education institutions can address the deficiencies in current graduate level programs for professionals challenged by the growing and more sophisticated criminal element preying on today's society.

The nation's universities should deliver enlightened, integrated, competency-based educational programs to provide police investigators with a technological advantage over the criminal elements. Scientific advances have begun to impact every facet of the crime laboratory as scientists are developing new and improved techniques for detecting and distinguishing trace evidence. These technological breakthroughs have substantially improved the application of scientific knowledge and skills necessary for linking a person or object to the scene of a crime. These challenges have created the

demand for new skills in the workplace—for both law enforcement professionals and forensic scientists in the laboratory. (National Institute of Justice, 2003a).

A cross-discipline approach teaches students and practitioners to understand the forensic implications of evidence. (Michigan State University, 2004). Combined with a thorough understanding of scientific principles, techniques and procedures, a forensic investigation curriculum that focuses on the educational needs of criminal justice students and crime scene investigators can address the disconnect that currently exists between the disciplines. The goal of the curriculum is to provide public safety agencies with well-trained, highly educated professionals who are capable of understanding the role forensic evidence plays in linking suspects to crime scenes. Forensic investigators should not only be skilled in maximizing evidence recovery, but should have the knowledge, confidence, and expertise necessary to convey these principles as they present testimony in criminal prosecutions.

My research shows that existing criminal justice programs do not provide sufficient exposure to scientific knowledge and protocols for graduate students. The criminal justice discipline emphasizes theory and centers on the causes of crime and its impact on society. Criminal justice courses fail to incorporate opportunities to combine theoretical knowledge with forensic applications. This discipline seeks answers to the question of “why” a crime was committed—not the determination of “who did it.” Current criminal justice programs generally offer students an opportunity to complete an introductory course in evidence collection, but this is not a requirement for graduation nor is it adequate preparation for processing the scene of a crime.

Forensic scientists are trained to be experts in the applied sciences, and have little or no exposure to the protocols that are utilized by crime scene investigators to collect, package, and transport physical evidence to the laboratory for scientific analysis. Scientists are proficient in the techniques to process evidentiary items in the laboratory, but have no background training as to why or how the evidence was obtained. These researchers strive to identify the origin or physical changes, but cannot address the “who did it” question.

This study is designed to identify the skills that are necessary for the efficient and effective processing of a crime scene. I conducted a critical analysis of the strengths and limitations of 290 existing graduate forensic science and criminal justice programs in the United States. I synthesized the findings to develop the basis upon which a proposed model interdisciplinary curriculum providing specialized expertise, training, and education in all facets of forensic investigation.

The review of literature helped in identifying areas of academic study that are important for forensic investigation. To integrate this many disciplines into a cohesive and comprehensive curriculum will require theoretical and practical approaches in instructional design. In the effort to educate students through the full range of skills and competencies, faculty members will be required to determine key concepts and perspectives that permeate courses across the program. A multi-disciplinary approach requires new courses based on emerging technologies, case law and today’s changing society.

The model curriculum proposed as a result of this dissertation research also must address the disconnect between the disciplines of forensic science and criminal justice. The knowledge existing in these two disciplines has not been gathered and organized into an integrated graduate program for practitioners. The program proposed here will cultivate the relationship between theory (criminal justice) and its application (forensic science). Graduates in forensic investigation will be able to maximize retrievable evidence and information at crime scenes, and to contribute to the advancement of knowledge, critical thinking skills, and attitudes necessary to broaden the spectrum of this multi-disciplinary approach to crime scene investigation.

The proposed forensic investigation curriculum is based on the principle of increasing domain-specific knowledge by integrating knowledge from many disciplines in a comprehensive context that reflects the needs of contemporary crime scene investigators. Under this principle, disciplinary borders will become unimportant. Instead, areas of shared interest and knowledge should be identified and refined, and a search should be made across disciplines for the most effective and innovative educational strategies. For most faculty and instructional designers, a paradigm shift to a learner-centered curriculum may also satisfy the variety of initial levels of competency that students will bring to this new program. Most importantly, the courses will be scientifically based, practical, and focused on the forensic implications of crime scene processing.

Today's societal needs are fluid, and our universities must continue to proactively plan to prepare students for the challenges of an ever-changing professional environment.

Advances in technology will create an increased need for forensic investigators that have the knowledge, skills, and abilities necessary to recognize the criminal applications of technology (Buerger, 2004). The proposed model curriculum can stimulate collaboration, and organization of concepts and methodologies across disciplinary lines, and, if implemented, will provide a competency-based education that can address the needs of future crime scene investigators.

An institution considering implementation of the proposed forensic investigation curriculum must determine an academic “home” for the program. The model curriculum is designed for practitioners with a behavioral or social science undergraduate degree. The purpose of the forensic investigation curriculum is to develop knowledge, skills, and abilities that crime scene investigators need to fulfill their job responsibilities—not conduct laboratory analyses of forensic evidence.

Methods and Procedures

My review of 290 graduate programs in forensic science and criminal justice provided the conceptual basis for this study and guided the design, execution, and framework for the collection and analysis of data. Using both quantitative and qualitative approaches, I surveyed crime scene investigators and educators affiliated with The University of Tennessee’s National Forensic Academy. This participant group represents practitioners nationwide who respond to the scenes of crimes, identifying, collecting, and preserving evidence, and presenting that evidence for consideration in courts of law.

Drawing on my review of the existing graduate programs in forensic science and criminal justice, I have developed four research questions that have determined the design of the study:

1. What skills do crime scene investigators believe they need to do their jobs?
2. What skills do crime scene investigators expect to gain from an idealized masters program?
3. What courses do crime scene investigators believe will help them develop the skills they need to do their jobs more effectively?
4. What are the differences between the crime scene investigator's idealized masters program and current programs in forensic science and criminal justice?

Data for questions 1 - 3 were gathered through the use of an online questionnaire designed to measure the perceptions of the respondents. Question four was answered by comparing the analysis of the 290 graduate programs I examined to the responses of the survey respondents regarding course topics for inclusion in a forensic investigation program.

Analysis of the data was completed using the descriptive statistics function of Statistical Package for the Social Sciences (SPSS). The survey findings were then used to formulate interview questions. Existing graduate school program documentation, higher education curriculum development literature, and an analysis of the data generated by the online questionnaire and personal interviews were combined to form a model forensic investigation curriculum.

Assumptions

The following assumptions apply to this study:

- The 129 graduates of the National Forensic Academy and 29 facilitators, 9 scholars, and 6 researchers comprise a representative sample of crime scene investigators and practitioners from across the nation.

Limitations

The following limitations apply to this study:

- There were erroneous e-mail addresses in the database that was used to solicit participation in the online questionnaire due to the lack of a systematic method for updating the database.
- Respondents' education level and future aspirations to attain advanced degrees were unknown at the onset of this study.
- Because law enforcement is a male dominated profession, the target population reflects this inequity as well. Of the 114 practitioners, only 26 (22%) are females. Of the 37 potential facilitator participants only 9 (24%) are females. No gender data was included in the online questionnaire in an effort to encourage participation while protecting the privacy of respondents.
- The target population for this study was not random. The graduates and facilitators of the NFA are considered knowledgeable practitioners who would be interested in the development of a forensic investigator curriculum for graduate students.

Organization of the Study

This study is organized into five chapters. This chapter introduces the problem, gives the rationale for the study, and states the problem and significance of the study. Four research questions are posed, and the methods and procedures used to answer those questions are summarized. Assumptions and limitations are also identified and a mini-glossary of terminology used frequently throughout this study is also provided for the reader.

Chapter 2 provides a review of the current literature in three major topic areas including: (1) crime scene investigator skills, (2) existing master's programs in forensic sciences and criminal justice in 290 colleges and universities across the United States, and (3) higher education curriculum and the constructivist approach to instructional design.

Chapter 3 describes the methods and procedures followed to conduct this research study. The design of the study, the questions that guided the research and methodology, and the methods used to analyze the data, including the statistical procedures are explained in this chapter.

Chapter 4 provides a summary of all the data as well as the results in relationship to the guiding questions. And finally, Chapter 5 presents a synopsis of the study, the conclusions and implications that can be drawn from the study, and recommendations for further research. A bibliography and an appendix follow these five chapters. The appendix contains the online questionnaire, other materials used in the study, and the proposed model curriculum.

Chapter 2

Review of the Literature

Chapter 1 provided an introduction and a statement of the problem: the need for graduate level forensic investigation curriculum that can span the gap of knowledge between the disciplines of forensic science and criminal justice. This chapter presents a review of the literature in the categories pertinent to this research project. The questions under study are multi-dimensional; therefore the literature review is organized into sections that correlate to each of the four research questions.

A brief overview of the development of police officer education will acquaint the reader with the topic. Conclusions drawn by the researcher from the review of literature are found at the close of each section.

Police Officer Education

Cesare Lombroso is recognized as the father of modern criminology, and promulgated the theory of the “born criminal.” His studies concluded that criminals could be identified through criminal anthropology, which uses the size of various body parts to determine a person’s pre-disposition to commit crime (Horn, 2003). Lombroso’s hypothesis was later disproved, yet his speculation that a “sinister countenance” could accurately determine a man’s guilt or innocence lasted into the 20th century.

Lombroso’s research and publications were widely followed in the United States, and helped to inspire the work of police proponents such as August Vollmer that finally succeeded in the introduction of science to criminal justice in the early 1920s. Forensic science and criminal justice emerged during the 20th century, but due to the inadequate

education of early investigators, there was a lack of appreciation for the contribution forensic science could make to the adjudication process (Schroeder, 1977).

August Vollmer, the most prominent police reformer in America, was an early advocate of the concept of educating police officers, and created the Berkeley Police School at the University of California in the early 1900s. He proclaimed that society has not yet recognized that the work of the modern policeman required professional training comparable to that of other skilled professions (Leonard and More, 1987).

Attempts to introduce professionalism to police officers began when Vollmer, seeking new applicants for the police department, advertised in the University of California's college newspaper for young men who had attained the higher education necessary to perform the duties of a law enforcement officer. Though Vollmer only completed the sixth grade, he rose to the distinction of full professorship at both the University of California and the University of Chicago (Vollmer, 1936). His efforts to introduce higher education to law enforcement earned him recognition as the "father of modern day policing" (Leonard and More, 1987).

Vollmer continued to implement his innovations by establishing the first police crime laboratory in the United States. His lifelong commitment to insuring that police work be recognized as a profession led to the recommendation of the Wickersham Crime Commission in 1931 that all police officers be required to attain higher education. (Leonard and Moore, 1987).

Many 1920s criminal justice courses were designed around the need to defend society against the "natural necessity" of crime. Four decades passed before the

emergence of the criminal justice discipline. This new discipline incorporated the components of law enforcement, courts, and corrections into the curriculum and disproved Lombroso's "born criminal" theory (Horn, 2003).

In 1960, 26 baccalaureate and graduate programs in criminal justice were identified in the United States, however 22 of these programs were located in California (Tenney, 1971). The rapid increase in crime in the 1960s and 1970s led the federal government to turn to academicians in an attempt to address the advancing needs of law enforcement agencies (Weirman and Archambeault, 1983). In 1965, President Lyndon Johnson established the National Crime Commission, and many two- and four-year police science and criminal justice programs were launched to meet the demand for "professional" police officers (Tenney, 1971). A survey conducted by the International Association of Chiefs of Police (IACP) found that by 1968, there were 261 law enforcement programs across the country offered by 234 institutions (IACP, 1973).

The Omnibus Crime Control and Safe Streets Act of 1968 extended the authority of the Law Enforcement Assistance Administration (LEAA) and enabled the agency to provide grants and loans to entice college students to enter newly developed criminal justice programs. The Law Enforcement Education Program (LEEP) sponsored courses were created to professionalize police forces in the mistaken belief that education alone molds individual behavior. The federal education loans were forgivable at a rate of 25% per year of subsequent service in a law enforcement agency, and though the programs succeeded at increasing enrollment in criminal justice programs, the quality of instruction in the discipline was found to be substandard (Saunders, 1970).

Colleges and universities introduced two-and four-year criminal justice programs focused on the theoretical causes of crime and the basic delivery of services as a new discipline. However, the programs became mired in the behavioral sciences, and interdisciplinary courses were limited to sociology and cultural anthropology, while law enforcement practitioners were forced into unfamiliar roles as faculty members (Tenney, 1971).

The Law Enforcement Education Program was not successful because local law enforcement agencies failed to require baccalaureate degrees from new employees. There was no clear definition of the goal to “professionalize” law enforcement, and criminal justice training in the United States was short, dull, and ineffective (Tenney, 1971).

There were many concerns regarding the deficiencies of the law enforcement curriculum. A behavioral scientist has very little knowledge and no experience in criminal investigation, while a professor with police experience usually lacks the background in theory and deviant behavior that is present in most criminal justice courses. Furthermore, the Law Enforcement Assistance Administration failed to provide funding for research or curriculum revisions. The availability of tuition subsidies increased the number of students and taxed an already over-burdened faculty. The consequences of those weaknesses were overall, an “academic dryness” (Saunders, 1970).

Throughout the 1970s, federal funding created a proliferation of law enforcement and criminal justice programs in colleges and universities. By 1977, there were 1,009

private and public institutions offering criminal justice related programs with 419 bachelors degrees, 221 masters degrees, and 32 doctoral degrees (Bennett and Marshall, 1979).

Most of the student participants in the Law Enforcement Education Program were “in-service” personnel (Weirman and Archambeault, 1983). There was no effort to differentiate between “pre-service” and “in-service” students in the curricula even though each of these groups had distinct educational and professional needs that were not addressed in the original police education programs, and very few areas of specialization were included in the curricula. The institutions of higher education were caught between the demand to respond and the inability of academic departments to do so in a timely manner (Tenney, 1971).

In 1974 the LEAA funded an analysis of the “professionalization” of law enforcement and which established that 37% of recruits entering police service had at least one year of college, and 10% had completed four or more years. Hoover (1975) found that though these efforts had increased the number of law enforcement and criminal justice students in the relatively new discipline, no curriculum was developed to address the specialty areas such as criminal investigation and crime reduction.

The National Advisory Commission on Higher Education for Police Officers attempted to determine how to increase the quality of police education programs. They recommended eliminating two-year programs and the integration of real-life experiences into the curricula. They found that curricula for police officers should be developed across a wide spectrum of disciplines in an effort to further the development of a more

comprehensive criminal justice discipline. Some high quality programs provided a broad education, and others were staffed by poor faculty that provided training instead of education (Sherman, 1978).

Many researchers voiced the need for re-designing criminal justice curricula, but there was little evidence that these revisions were occurring. Jacoby (1996) proposed the “real-world” exposure of students to the community through a structured educational format promoting active participation while enabling the student to develop reflective practices that would be useful throughout their careers.

Penn (2003) attempted to draw his readers’ attention to the public’s need for “university-educated” professionals. He studied the potential for integrating service learning into the more traditional curricula of criminal justice programs.

Buerger (2004), a former police officer turned academician, presents a succinct summary of criminal justice education today by stating “The law enforcement profession apparently has not known what to do with a college education” (Buerger, 2004:27). He found the criminal justice degree has not been valuable to law enforcement because most curricula focus on theory and research rather than the practical aspects of policing. He observes that many criminal justice students graduate better-prepared to work as social scientists than as law enforcement officers. Maintaining the stance that “experiential learning constitutes the only real preparation for police work,” he suggests integration of formal study and practical experiences in new criminal justice programs (Buerger, 2004:27).

Presently there are essentially two types of education available to current and future crime scene investigators: undergraduate degrees in criminal justice that are generally presented from a social science systems perspective, and on-the-job skills acquisition. Neither type of knowledge acquisition provides sufficient preparation necessary to meet the professional responsibilities of crime scene investigators (Buerger, 2004). According to my research, technological advances are not addressed in existing criminal justice graduate curricula. Most institutions have failed to recognize the extent to which criminal justice and forensic science are becoming intertwined, therefore exacerbating the disconnect between the disciplines and the lack of capacity to address the dilemma.

Sciences Utilized by the Crime Scene Investigator

Seldom do the police respond to a crime scene that does not demand a multi-disciplinary approach for locating, identifying, collecting and preserving evidence. The need for a multi-disciplinary training program for police officers was first recognized in the early 1930s through a study conducted by the Los Angeles Police Department and the California State Department of Education. The study concluded that competent police officers should have knowledge in one hundred and fifty eight fields in order to develop professional competence (U.S. Department of the Interior, 1938).

One of the foundations of my study is supported by Pickering and Bachman's (1996:105) findings that "forensic investigation is an eclectic field that borrows techniques and procedures from many fields." This need for a wide range of skills greatly increases the information burden of crime scene investigators.

Schroeder (1977:v) proclaimed “No science is forensic until the justice system so decrees.” Traditionally, witnesses in criminal proceedings testifying in cases regarding forensic science have come from the medical field. Through the expansion of technology and the integration of scientific breakthroughs such as DNA, the witness pool has expanded to include crime scene investigators and other first responders (Schroeder, 1977:v).

With Schroeder’s findings in mind, additional information pertaining to the multi-disciplinary tasks related to crime scene investigation is provided below. This information allows the reader to better comprehend the duties and requirements for processing the scene of a crime.

Applied Sciences

A 2003 National Institute of Justice (NIJ) publication asserts that the rapidly evolving scientific advances in all areas of forensics must be incorporated into all aspects of practitioner education. It details areas where potential scientific breakthroughs will impact the duties and responsibilities of crime scene investigators. Advances in analytical toxicology, trace evidence, forensic biology, firearms and toolmark examinations, fingerprint analysis, digital evidence and forensic pathology can enhance the capabilities of investigators who are searching for physical evidence at the scene of a crime. Future innovations include the possibility of DNA chip technology that may provide immediate DNA analysis at the crime scene by investigators who are trained as forensic investigators (National Institute of Justice, 2003a).

Capsambelis (2002) finds little evidence of research addressing the training needs of criminal investigators, but shows that considerable effort has been spent determining the educational needs of forensic science students. Few academic programs exist, Capsambelis continues, because, in the past, crime scene personnel have gained their knowledge and skills “on-the-job.”

The most desirable situation, according to Levinson and Almog (1989), is to have forensic evidence processed by a senior scientist at a crime scene. Although this approach is impractical and usually not feasible, Levinson and Almog’s recommendation certainly indicates the importance of making sure that those responsible for crime scene processing and evidence collection have training as specialists.

There is an insufficient pool of qualified forensic scientists, a shortage that can be attributed to colleges that offer degrees but do not have curriculum that includes the basic science courses necessary for this occupation. Most current educational programs are hampered by the lack of evidence-handling protocols and the absence of training in the proper use of scientific equipment. The failure of today’s colleges to properly educate forensic science students results in costly, labor-intensive remedial training by employers—which in turn dramatically increases the length of time before a forensic science graduate is prepared to conduct scientific analysis of evidentiary materials (National Institute of Justice, 2003b).

Consequently, the NIJ has created a technical working group comprised of forensic science experts and educators to develop a model curriculum for degrees in forensic science. This collaborative effort is intended to foster communication between

the forensic and academic communities and thereby improve the skills of future graduates of forensic science programs.

Another scientific area identified by the NIJ report (2003a) as one of the fastest growing technologically-advancing fields in forensic science is the use of Deoxyribonucleic Acid (DNA) analysis to identify individuals. The Institute has found that over the past decade, DNA analysis has rapidly become recognized as an effective tool that can (1) positively link a suspect to a crime scene (2) exonerate a person mistakenly-accused or convicted of crimes and (3) identify missing persons or unidentified human remains when sufficient biological evidence exists. Through the use of the Combined DNA Index System (CODIS), evidence from various crime scenes can be linked. CODIS also stores offender profiles from federal-, state-, and locally-convicted felons, and the two databases are capable of associating suspects to crime scenes to which they may not previously been linked.

Current U.S. Department of Justice initiatives are funding DNA research at unprecedented levels in an effort to ensure that this technology reaches its full potential to solve crimes (NIJ, 2003a). A 2001 survey conducted by the Bureau of Justice Statistics reveals that between 1997 and 2000, there was a 73% increase in DNA casework backlogs (Steadman, 2002).

Forensic evidence must be identified, collected and preserved in a manner that ensures its integrity and maintains its availability throughout the entire criminal justice process. Recent advances include better methods for examining smaller and more degraded DNA samples. The development of mitochondrial DNA analysis, which is

useful for investigating crimes such as kidnapping and the discovery of skeletal remains where nuclear DNA is not present, is also revolutionizing the capabilities of crime scene investigators and forensic scientists in crime laboratories (National Institute of Justice, 2003a).

The United States Presidential DNA Initiative (NIJ, 2003a) maintains that DNA can be used to identify criminals with unprecedented accuracy. DNA analysis can also be used to protect the innocent from wrongful prosecution, provide post-conviction relief, and identify missing persons. Crimes that have gone unsolved for years have been reopened and resulted in convictions based on the results of DNA analysis. Under this initiative, the United States Attorney General is currently establishing projects that will demonstrate the benefits the law enforcement community can realize by the full integration of DNA technology to solve crimes and, more generally, by maximizing the use of the forensic sciences in the criminal justice system.

As early as 1977, academicians had the foresight to support the inclusion of forensic science education for law enforcement practitioners. They accurately predicted the benefits of integration of the disciplines in order to provide an equitable justice system (Schroeder, 1977). However, my review of the literature showed that no effort was undertaken to ensure that forensic science education was integrated into graduate level programs.

Lambert et al. (2003) found that forensic science plays a critical role in the criminal justice system as it incorporates the application of scientific analysis of evidence

into the courtroom. However, Lambert's study found that little has been written about the contributions of forensic science to courtroom proceedings.

My research reveals that existing forensic science graduate programs are science- and technology-based extensions of undergraduate studies. Admission to the programs is restricted to applicants who have baccalaureate degrees in biology and chemistry. The curricula are primarily focused on research or increasing laboratory skills and knowledge. Graduates from forensic science programs are knowledgeable in laboratory practices and have a scientific knowledge base, but the curricula but lacks the law enforcement skills and social science background that are incorporated into a criminal justice program. Forensic scientists are effective in the crime laboratory, but not useful at a crime scene.

Behavioral Sciences

A study conducted by Sorensen et al. (1994) revealed a broad contrast between the disciplines of criminology and criminal justice: while criminology focuses on the causes of crime as a social phenomenon, criminal justice focuses more on law enforcement and agency operations. Likewise, criminologists are more inclined to research and publication, while "criminal justices" are practitioner-oriented. In 1983, Peterson and Angelos found that the majority of academicians teaching in criminal justice programs had a social science background. About 40% of forensic science and criminalistics programs were located in criminal justice departments, with the remainder being located under sociology departments.

My own extensive review of 290 graduate programs in forensic science and criminal justice, shows that the programs generally do not offer more than a baseline set

of skills in scientific practices. Traditional criminal justice curricula include leadership, administration, problem solving, and management-focused courses. They tend to concentrate on criminological theory and exclude science-based applications; a minimal amount of formal training in scientific-support techniques was included in the programs I examined. Program descriptions include statements indicating the programs are geared to practitioners seeking to gain administrative-types positions within the three components of the criminal justice system.

The NIJ (2003a) highlights problems with forensic science programs, but fails to recognize the gap between forensic science and criminal justice. Though the importance of proper collection and preservation of biological evidence is recognized in the NIJ report as essential for accurate scientific analysis, the report makes no acknowledgement that proper care must begin by training crime scene investigators to deliver the uncontaminated evidentiary items to the forensic laboratory for examination.

The knowledge, skills and abilities required of crime-scene investigators to utilize evidence recovery techniques properly and then to present evidence in Court effectively lends credence to the underlying assumptions of this dissertation research. Educational opportunities that develop skills and knowledge demanded by rapid technological advances are not readily attainable through existing graduate programs. Although there are vocational training programs and undergraduate courses, without an improvement in graduate level education, criminal justice programs fail to adapt to the changing needs of the students and practitioners and to the advances in forensic technology.

In his review of law enforcement training programs, Lindquist (1994) discovered a need to “heighten awareness of evidentiary standards” for law enforcement officers. The undergraduate classes he reviewed were designed to improve the employability of students in criminal justice, not to train them to work in crime laboratories. The undergraduate programs he observed attempted to broaden students’ knowledge about the importance of forensic evidence, but did not teach technical skills. (Lindquist, 1994).

Lambert et al. (2003) also highlights a study of law enforcement agencies in Michigan to determine the forensic science needs of recruits and applicants for positions with the agencies. The literature review conducted for Lambert’s study reveals that little research has been conducted on the needs of law enforcement personnel, though the needs of crime laboratories have been examined in depth. The current problem that forensic evidence is often rendered inadmissible because of improper collection techniques was addressed in the Michigan study. The analysis revealed that much potential evidentiary material is either left uncollected or trampled underfoot because law enforcement personnel are not adequately trained to process crime scenes. Since forensic science involves the scientific analysis of evidence, forensic science should be a vital part of the United States’ criminal justice system (Lambert et al., 2003).

The importance of forensic evidence has been brought to the attention of the public by high profile criminal cases that dominate national and local news broadcasts such as the O.J. Simpson murder trial in 1994. According to Berg and Horgan (1998) and Pezzella (1995), the prosecution team in the Simpson case failed to secure a conviction largely because the defense team was able to create a reasonable doubt as to

the credibility of forensic evidence found at the scene of the murders. Lee and Labriola (2001) report that forensic scientists testifying for the prosecution in the Simpson case asserted that the chance of the DNA from the crime scene matching anyone else other than O.J. Simpson was less than 1 in 170 million. Nevertheless, faulty evidence collection, preservation, and documentation contributed to the acquittal. Even with the accuracy of the technique, the jury failed to convict largely based on the actions of those processing the crime scene (Lambert et al., 2003).

The opportunity for post-baccalaureate education must become available to professionals involved in crime scene investigation. In order to ensure the optimal use of technological advances such as DNA analysis to solve crimes and assist victims, the disciplines of criminal justice and forensic science must provide an integrated science-based program. For example, crime scene investigators are not responsible for accurately determining the Post Mortem Interval (time since death); however, they should possess the knowledge and skills that allow them to provide investigative leads that can expedite an investigation while awaiting final determinations from the experts.

At present, as Pickering and Bachman (1996) explain, police officers recognize the fact that an examination of a skeleton by a forensic anthropologist is the only way positively to determine who, when, and what caused a death. Pickering and Bachman (1996) maintain that forensic anthropologists are specialists who are trained to observe both natural and artificial changes at the crime scene related to soils, plants, and insect activity. Those crucial observations may lead to the location and identification of critical evidence, thus enhancing the investigation.

Forensic anthropologists are not generally available to small or rural law enforcement agencies. Response time may vary from several hours to a day or more, and the crime scene investigator can assist by focusing the investigation and ensuring the integrity of the crime scene (Pickering and Bachman, 1996).

Higher education institutions must be prepared to respond to the need for technically oriented graduates equipped with state-of-the-art knowledge, skills and abilities who can respond to society's demand that justice be fully served by all the technological means available. It is essential to build public crime lab capability, design new curricula for educating forensic scientists, and foster academic and practitioner collaboration. However, the needs of the initial point of evidence collection—crime scene investigators—must also be recognized and the fundamental knowledge and capabilities of advancing sciences must be integrated into the criminal justice curriculum.

An undergraduate degree provides a foundation for entry-level personnel; nevertheless, higher order skills such as critical thinking and reflective practice are necessary for senior investigators. These abilities are acquired through graduate programs. Finally, as Capsambelis (2002) notes, though there are mandatory minimum standards for police officers, and requirements for certification for forensic scientists, no such standards exist for crime scene investigators.

Current Graduate Programs

I surveyed 290 masters programs in forensic science and criminal justice across the nation. My objective was to determine the types of degrees and the focus of the

programs that are currently available. I established several criteria that I used to determine whether the programs were relevant to this research:

1. Forensic Science admission requirements: the prerequisite of a Baccalaureate degree in an applied science disqualified the program from further consideration.

2. Forensic Science programs: if the goal was to train laboratory analysts, the program received no further consideration as this research is focused on training crime scene investigators working in law enforcement.

3. Criminal Justice programs: if the curricula reflected a theoretical rather than a practical or applied approach, for example, studying the causes of crime or the societal impact of crime, the program was eliminated from consideration.

4. Criminal Justice programs: if the program description defined the targeted audience as individuals whose goal is to become administrators in a criminal justice agency, it was removed from consideration.

I used a number of methods to identify the majority of graduate programs in the disciplines of forensic science and criminal justice. The programs were examined on the World Wide Web from January through September 2004. A detailed explanation of the search method I used to locate the programs is provided in Chapter 3.

Websites are a primary mode of communication between institutes of higher education and potential students due to the ease of accessibility and prompt distribution of current information. The websites are maintained and updated by each institution and information obtained from the websites is generally more accurate and timely than what is available in printed catalogs, which are only updated on an annual basis.

This extensive examination revealed that many colleges and universities, such as Baylor University in Texas, have recognized the need to expand *undergraduate programs* in both criminal justice and forensic science; however no master's level studies are offered. Baylor University's target audience is pre-medical students; its program literature emphasizes that students can simultaneously complete all required courses in the pre-med or pre-dental curricula.

Fabianic (1998) asserts that colleges and universities do not build their reputations on the basis of their undergraduate programs. Graduate programs bring researchers, federal funds and private donations, prestige, and most importantly, students. A few institutions offer introductory criminal justice courses in their forensic science curriculum. Undergraduate elective courses do not adequately expand professional knowledge within the discipline, nor do they attract graduate students to the schools. Lindquist (1994) found that many undergraduate programs offer a criminal investigation or forensic science class, and many advertised a concentration in these subjects.

During my examination of the nation's colleges and universities, I located several graduate programs that have acknowledged the existence of a disconnect between forensic science and criminal justice in higher education. Below is a sample of some of the programs I reviewed:

California State University in Los Angeles offers a Master of Science in Criminal Justice and a Master of Science in Criminalistics. The Criminal Justice track offers two options: a focus on Administration or in Forensic Mental Health. The Administrative focus relies heavily on theory and research with implications for criminal justice policy

and practice. The Mental Health track trains students in the delivery of services to psychiatrically-impaired clients within the criminal justice system. The Criminalistics Masters has a physical and natural science foundation and prepares students to function in a variety of scientific disciplines in the laboratory, but does not address crime scene investigation. http://calstatela.edu/dept/crim_jus/msdegree.htm

Pennsylvania's Duquesne University has initiated a five-year bachelor/master's degree in Forensic Science and Law, combining scientific training and application to the civil and criminal justice systems. The curriculum components are heavily laden with studies in natural and environmental sciences, and include only seven hours of courses that are related to the field of criminal justice. The student earns a baccalaureate degree in biochemistry or biology. This is a unique approach to bridging the gap between the disciplines, as it is the nation's first forensic science program housed in a College of Law. However, the program falls short of addressing the needs of crime scene investigators because it is focused on training and educating future forensic scientists.

<http://www.forensics.duq.edu/academicprograms/forensicmasters.html>

One of the largest and most well-established criminal justice programs in the United States is at Michigan State University. A review of the graduate school web page reveals they have begun a joint degree program offering students the opportunity to earn both a Master of Science and a Ph.D. in Forensic Science simultaneously. Students enrolled in the dual program can complete all the requirements in about the same amount of time normally required to complete a Ph.D. The joint degree program is available only to applicants who have earned undergraduate degrees in fields such as forensic chemistry,

biochemistry, chemical engineering, biology, human biology, and anthropology. It is interesting to note that a student who has earned a baccalaureate degree in another discipline (such as criminal justice) is not eligible to enroll in this program.

<http://www.forensic.msu.edu>

Sam Houston University boasts of the largest criminal justice faculty in the world, however, the College of Criminal Justice does not offer a cross-disciplinary program of study that develops the knowledge, skills, and abilities necessary for crime scene investigators. Graduate programs are designed for students seeking to advance to management positions in the criminal justice system. A Master of Science degree in Forensic Science is also offered by the College of Criminal Justice. This program is focused on the application of principles of physical sciences to the purposes of law. Participants in the graduate program must have earned a bachelor's degree in chemistry, biology, or criminal justice (with a strong background in chemistry, biology, physics, and botany) and have previous laboratory experience. These requirements limit the availability of this training to those practitioners seeking to enhance their analytic skills in a laboratory environment and are not geared to the needs of crime scene investigators.

<http://www.cjcenter.org/College/forensic/>

The John Jay College of Criminal Justice at the City University of New York has won international recognition for academic work in the problem areas of the criminal justice system. John Jay has attempted to address the nation's shortage of forensic scientists by establishing a Master of Science degree in Forensic Science. The program integrates state-of-the-art curriculum within the forensic sciences, toxicology, and

biological sciences. The program, however, does not recognize the needs of crime scene investigators seeking higher education and training in the skill sets that are essential for accurate processing of physical evidence.

<http://www.jjay.cuny.edu/programsGraduate/progGraduateDegrOffe.asp#Anchor--THE-64081>

Marshall University in West Virginia is home to the Forensic Science Center. This comprehensive organization is linked to the West Virginia State Crime Laboratory and has established a master's degree program in forensic science with an emphasis on crime scenes. Applicants for this program must have completed undergraduate courses in biology, general physics, general and organic chemistry, with the associated lab work. The focus of this program is to train forensic scientists in how to conduct a crime scene investigation, and includes fieldwork with the WV State Fire Marshall's Office and the WV State Police Crime Laboratory. The curriculum emphasizes the use of laboratory techniques and equipment used to examine fires and explosions; however, it does not address other aspects of crime scene investigation.

<http://www.marshall.edu/www/grad.asp>

My examination of the programs revealed there are currently four graduate level interdisciplinary programs that educate students in the range of skills and competencies that a forensic investigator should possess. Those programs are found at (1) The University of New Haven, (2) Nebraska Wesleyan University, (3) George Washington University, and (4) National University in California. A more detailed presentation of the programs is contained in Chapter 4 where the findings are discussed.

The limited number of graduate level programs currently working to bridge the disconnect between the disciplines of forensic science and criminal justice cannot adequately meet the needs of today's society. With only four programs available nationwide, access and opportunities are restricted by the location and capacity of the programs. There is, thus, a great need for a wider effort to establish graduate forensic investigation programs across the United States.

For decades, the primary burden of professional education has been borne outside the university system. However, because of a dramatic increase in knowledge and technological advances, academic institutions must respond by reforming their programs to provide the skills required of today's professionals. It is necessary for today's practitioners to understand the importance of forensic evidence and to be knowledgeable about the wide array of evolving technologies available to analyze evidence that may previously have gone undetected. As Schroeder (1977:5) first observed 30 years ago, "there are not fixed classes of sciences used forensically." The trial judge alone determines what techniques and testimony to accept, and crime scene investigators must be highly trained in order to establish their credibility as witnesses if forensic evidence is admitted by the Court for consideration of guilt or innocence. A forensic investigation curriculum can provide a standard program that will assist the crime scene investigator in establishing credibility as a witness, thus mitigating a defense attorney's attack on the knowledge, skills, and abilities of the investigator.

The United States Department of Labor (1996) designed the Occupational Information Network (O*NET) as the nation's primary source of occupational

information, a reference for human resource practitioners, workers, education and training developers, program planners and students. The O*NET content model utilizes cross occupation descriptors and occupation specific descriptors to identify and integrate the most important types of information into a comprehensive database. The six domains allow occupational information to be applied across categories and include work activities, occupational characteristics, worker requirements, experience requirements, worker characteristics, and occupation-specific information. The system was significantly updated and improved in November 2003 and now incorporates over 950 occupations into a single database. O*NET is compiled and maintained by the Department of Labor and contains the most comprehensive information pertaining to employment positions in the United States. <http://onetcenter.org>

In a perusal of the occupational database for a job description equivalent to that of a crime scene investigator, the most pertinent job title found was a detailed report for *Criminal Investigators and Special Agents*. The same search conducted for the discipline of forensic science yielded a detailed report on the job title of *Forensic Science Technicians*.

Curriculum Design and Inter-Disciplinary Courses

Academic restructuring of courses is required in order for the programs to remain a viable part of today's universities. Innovation is the key to the continued existence of programs as colleges and universities vie to attract top scholars into graduate programs. During the last decade, restructuring academic programs has become necessary for survival in a challenging and changing economy (Saunders, 1999).

The Need for Practical and Problem-Based Education

Merriam and Caffarella (1999) speculate that half of what most professionals know when they finish their formal education will be outdated in less than five years. They go on to propose the timeframe may be reduced to mere months in careers where technological advances are rapid. They concur with the consensus that technology has unequivocally changed everyday life, and that educational opportunities must be provided that meet the needs of a rapidly evolving society.

In her discussion of “professionals” who are life-long learners, Taylor (1997) points out that these students, who come to the classroom seeking mastery in their professions, bring with them valuable pre-course experience. They are both responsive to the challenge of learning and accept responsibility for sharing material resources, developing new approaches and making judgments required to grapple with the issues posed in problem-based courses.

There is an ongoing need to incorporate experience with curricula content through dialog between academics and practitioners. This interchange is critical to ensure that disciplines remain relevant to students (Baush, 1999). Knowledge construction is much more effective when students can link new content to their existing background knowledge. Expecting practitioners to accomplish job behaviors at higher levels requires prior knowledge, current experience, and the ability to associate job-behaviors with new knowledge (Good and Brophy, 1994).

The Need for an Interdisciplinary Approach

Barnett (1994) is a proponent of problem-based course design as a means of encouraging students to learn key concepts and skills of the disciplines. The application of this new knowledge across the traditional boundary lines promotes discovery of innovative solutions to new challenges.

According to Duffy and Jonassen (1992), traditional learning approaches have given way to a more situated environment that is reflective of real-world contexts. They advocate a shift towards a more constructive approach to educational programs in order to ensure that students in the classroom can see how information in the classroom is applicable to the work environment.

Arguing in support of higher education programs for crime scene investigators, Capsembeles (2002) states that a strong crime scene technician curriculum must be integrated with “extensive practical experience.” The importance of realistic training and practicality far exceeds the need for research and publications. Advanced methods of evidence collection can only occur by providing an “increased focus on formal education of the crime scene technician” (Capsembeles, 2002:120).

Shapiro (1999) echoes that finding as she reflects on the “fluidity” both within and among academic disciplines. She discusses the ways higher education is impacted by the economy, as new technology requires advanced education and retraining beyond traditional baccalaureate degrees. Professional and vocational jobs are more focused and institutions must respond to the changing society by creating niches if they are going to attract students. Academic disciplines must respond by shifting their boundaries and

creating new alignments and interdisciplinary programs that can create new intellectual territory (Shapiro, 1999).

Shifting professional boundaries also increase the need for higher education curricula to be responsive if colleges and universities are going to attract graduate students. Gagne (1977) stresses the importance of role analysis and determining the knowledge, skills, and abilities students need to perform higher-level job roles in an advancing society. He notes that the blending of the disciplines is more desirable for practitioners than researchers and academicians. Students should be able to relate course topics and skills to professional practice, which generally leads to more motivation and better scholastic performance (Gagne, 1977).

Gagne also addresses the issue of content sequencing, which may be based on many principles, from spatial relationships to functional systems to significant processes. Curriculum designers may use more than one of these principles to organize the course content. Whatever the organizing principle, competencies must also be sequenced from simple to complex, however, and care must be taken to ensure that the resulting curriculum is not simply a technical training program rather than a graduate degree course (Gagne, 1977).

There are some drawbacks to the interdisciplinary method of course design, including an inability to cater to individual student interests. There is also the need for faculty to be more accessible to course participants. Overall, providing real-world training environments also increases the number of hours both students and faculty must

invest. The acquisition of skills and the applicability of the new knowledge and abilities correlate to the defined need for competency-based curricula (Gagne, 1977).

Barnette (1994) offers additional support for interdisciplinary curricula in professional fields that require knowledge of a variety of scientific disciplines. Though such curricula are better for students, academicians and researchers are often not supportive of blending the disciplines. Barnett argues that this type of program also requires constant assessment to insure it remains in alignment with the actual profession (Barnett, 1994).

Bolton (2003) employs Kolb's Learning Cycles to describe the abstract conceptualization that occurs when students are able to synthesize concrete experience, reflective observation and active experimentation to other situations. Learners reflect on their actions by consciously returning to concrete experiences. Through the evaluation of what could have been done differently, new concepts are formed and learners then experiment with the new ideas, which lead to a process of continued change and growth. Training can begin anywhere in the cycle (Kolb, 1984).

Capsambelis (2002) advocates the proactive creation of crime scene investigation technology programs, maintaining that, sooner, rather than later, mandatory minimum educational requirements will be adopted for crime scene technicians just as they were for police officers 30 years ago. In Capsambelis' view, the need for extensive practical experience and be achieved through the adoption of a constructivist learning approach. During the development of new courses and programs, instructional designers must

address the professional and educational needs of tomorrow's crime scene investigators as well as today's practitioners (Capsambelis, 2002).

Problem-based courses stimulate students to discover and utilize key concepts and skills of the various disciplines to determine practical applications and resolutions of problems they face in professional practice. Effective course design requires students to arrive at solutions by employing a host of resources including lectures, independent study, and actual experiences (Gagne, 1977).

A range of knowledge determines what aptitudes problem-based courses must stimulate in students. The components of this model include (1) fundamental principles, (2) tacit information, learned from experts rather than textbooks, (3) procedural knowledge, (4) problem-solving, (5) community evaluation, and (6) interaction with people and team/group work (Woods, 1985).

The Need for Adult-Oriented (Andragogic) Methods

Malcolm Knowles (1970) introduced the concept of andragogy—helping adults to learn—and argued that adults who have assumed responsibility for their learning are much more effective learners. He postulated a continuum beginning with pedagogy (teacher-directed) and spanning towards andragogy (student-directed) learning, and argued that adults are independent and thus self-directed learners (Knowles, 1970).

Professional education should observe vocations to determine the appropriate shape and structure of courses and should use applied knowledge instead of “pure” knowledge to expand the number of stakeholders in the concept. Adult learners, who are more self-directed and independent, recognize the dynamic relationship among

professions and disciplines; likewise professional education programs tend to attract more “mature” students who are generally practitioners in the disciplines they are studying (Taylor, 1997).

Students enrolled in professional education programs bring valuable work experiences to the classroom, and are capable of analyzing, reorganizing, integrating, and processing knowledge (Taylor, 1997). Their contributions to the course are varied and extensive and they can share their knowledge with colleagues to create new understanding for all class members. These “peak experiences and epiphanies of learning” according to Bolton (2003) create an effective and cohesive learning environment. Faculty members who promote this cohesiveness within the classroom can create “communities of learners.”

Knowledge, skills, and abilities often do not transfer from subject to subject or from the educational environment to the professional arena because the traditional school environment differs so greatly from the real world. For students to actually “learn,” the faculty must become aware of this problem and present contextual-based educational opportunities (Duffey and Jonasson, 1992).

Conclusions

The review of the literature has shown past studies of the educational needs of crime scene investigators to be inadequate to address the research questions. The existing studies are specific to the disciplines of forensic science and criminal justice, and have limited generalizability to the questions currently under review in this dissertation study.

Lattuca (2001) aptly sums up her view by stating, “as knowledge expands, so do the disciplines.”

There is no single adult learning theory that can address the myriad needs of the lifelong learner. Andragogy and other models of adult learning can contribute to the educational process, but it is the experiences of learners that determine whether the course content is retained.

My research indicates that the most effective strategy for the proposed forensic investigation curriculum is to structure it on problem-based interdisciplinary courses. The goal of the program should be to integrate theoretical knowledge and practical applications from both the forensic science and criminal justice disciplines.

Through a comprehensive task analysis, each competency can be broken down into component skills and steps taken to ensure each skill is incorporated into the course. This can eliminate the possibility that essential knowledge or skills might be overlooked, which sometimes occurs in a more traditional curriculum.

Students must apply previous knowledge to identify current problems and determine what resources are necessary to resolve them. This synthesis of information and knowledge can facilitate the development of over-arching concepts and promote the transference of skills and abilities to future similar situations.

Thus, the review of the literature reveals the following:

- Problem-based courses produce a generative learning environment.
- Instructional designers must embed all the data needed to solve problems within the course content.

- Students must develop a reflexive awareness of both internal and external resources and seek to implement solutions to various problems encountered in scenario-based courses.
- Problem-based courses pose a natural foundation for development of an interdisciplinary curriculum. Such a program can address the gaps between forensic science and criminal justice

Chapter 3

Methodology

Chapter 3 describes the process used to conduct this research. Three sources of data informed this study: 1) a review of 290 graduate level programs in both forensic science and criminal justice, 2) online questionnaires, and 3) personal interviews. The quantitative data collected from the online questionnaires were analyzed using SPSS. The data generated from the personal interviews were coded, categorized, and analyzed qualitatively. The final analysis was a synthesis of the information collected from the review of the literature, the online questionnaires, and the interview process.

This chapter provides a discussion of the study's design, a description of the participants, and a description of the data collection and analysis procedures. Permission was obtained from The University of Tennessee's Institutional Review Board prior to beginning this research study. Confidentiality among the participants was maintained as all surveys were completed with no name or other identifying mechanism attached to the online questionnaire.

Design Overview

Crime scene investigators and those seeking to enter the field face a unique dilemma. Rapid advances in technology have greatly increased the role of forensic science in the criminal justice system (National Institute of Justice, 2004). However, my review of the literature indicated that higher education institutions have not responded at a pace that meets the needs of contemporary society. A mixed methodology of collecting both quantitative (online questionnaire) and qualitative data (personal interviews) was

developed to explore the gaps between existing educational programs and the knowledge, skills, and abilities needed by crime scene investigators to accurately perform their job responsibilities.

Case Study

The case study strategy, according to Philliber, et al. (1980), provides the researcher with the opportunity to intensely investigate one case in depth rather than examining several cases simultaneously. The use of the case study is the “preferred strategy” when studying a real-world issue, because it allows the researcher to maintain a holistic approach and provide meaningful characterizations of real-life situations. Other methods of research restrict the use of these strategies (Yin, 1994).

Merriam (1998) suggests the use of the case study strategy when focusing on a single entity, and supports the use of both quantitative and qualitative research processes when conducting case studies.

The case study approach was determined to be the most effective methodology for this research because it could facilitate the investigation of a contemporary phenomenon in a real-life context. A case study is unique and identifiable with clearly defined boundaries. The boundaries of this study were set to include only practicing crime scene investigators and facilitators affiliated with the Natural Forensic Academy. The phenomenon under study was the disconnect between the distinct set of knowledge, skills, and abilities that crime scene investigators need and the existing graduate programs in forensic science and criminal justice.

The case study strategy is useful when data collection requires the use of mixed methods and when there exist a high level of interest and close proximity between the phenomenon under study and the researcher (Merriam, 1998). With more than 25 years of professional work and study in the areas of criminal justice and forensics, I have a clearly defined interest in the topic. Working in a university environment, I believe it is my duty to ensure that higher education recognizes areas of deficiency and take steps to reduce or eliminate those deficiencies.

Mixed Methods Design

This case study incorporates both quantitative and qualitative methods of gathering data, in order to achieve an in-depth examination of the issues (Merriam 1998). The researcher should use as many sources of information as possible to substantiate the validity of a case study (Yin, 1994). When designed and implemented accurately, multiple sources of data yield multiple measures of the subject under study, and the convergence of the inquiry methods provides reliable findings. This triangulation of the results allows the researcher to look at themes that emerge from the quantitative instrument and then explore these trends more in depth through qualitative measures. Separate analyses of different sets of data, followed by systematic integration of the data sets can result in a more comprehensive interpretation of the data (Morse, 2003).

The data gathered in this study through personal interviews not only substantiated the results of the online survey, but also allowed the study participants to provide a more in-depth perspective of the issues being studied (Morse, 2003). The mixed methodology strategy also provided the opportunity to explore additional suggestions made by the

participants to discover shared meaning or other perspectives that were not measured through the survey.

The combination of findings from the literature review, the online survey, and the personal interviews made possible a depth of understanding of the phenomenon, since the multiple data sources could corroborate each other and allow the facts to converge, thus providing strong links between the research questions and the study conclusions (Yin, 1994).

Qualitative Research

Qualitative research is especially applicable when attempting to understand a group phenomenon. An understanding of real-world situations can emerge from descriptive data such as interview notes, observations, and documents that are the basis for analysis and interpretation of the phenomenon (Myers, 1997).

Qualitative research often deals with purposely selected, small samples of research participants who possess the insight and have the ability to generate rich and descriptive data that are captured in a narrative format. This type of research is most effectively conducted *in situ*, meaning the participant's natural setting. It is common for a qualitative study to shift focus as the researcher in the field gathers new information. This type of data collection and analysis can lead to a generalization that may be applicable to similar instances (Gay and Airasian, 2000).

The qualitative data collection for this study involved my immersion in the field through my professional responsibility as the primary instructional designer for the National Forensic Academy at The University of Tennessee. Results of the qualitative

data analysis and my review of 290 existing graduate programs in the disciplines of forensic science and criminal justice were used to formulate the open-ended interview questions that were used for the qualitative portion of this research study.

The Research Questions

The first step in this research design was the completion of the review of literature. The data compiled as a result of my review of 290 graduate school programs in forensic science and criminal justice, and higher education curriculum development literature produced four research questions used to form the strategy for conducting this study.

1. What skills do crime scene investigators believe they need to do their jobs?
2. What skills do crime scene investigators expect to gain from an idealized masters program?
3. What courses do crime scene investigators believe will help them develop the skills they need to do their jobs more effectively?
4. What are the differences between the crime scene investigator's idealized masters program and current programs in forensic science and criminal justice?

Answers to questions 1, 2, and 3 were based on the participant responses to the online survey and the personal interviews. Question 4 was addressed by combining the survey responses, information gained from the personal interviews, and the results of my document review. My conclusions are based on a synthesis of the entire data collection effort. The findings were then used to develop a list of courses and topics that form the basis for a model cross-disciplinary graduate forensic investigation curriculum.

Document Review

As a part of the review of literature, an extensive study was conducted of existing curricula in 290 master's level programs in forensic science and criminal justice. The programs reviewed are currently available at colleges and universities in the United States according to a compilation of lists produced by:

- *US News and World Report 2004* (website)
- *Peterson and Thomson 2004* (website)
- *Reddy's Forensic Page* (website)
- *Top Research Universities* (website)
- *American Association of Forensic Sciences* (website)
- *The Forensic Science Portal* (website)
- *Google Internet Search Engine* (website)

Published college reference books, such as *Barron's Profiles of American Colleges 23rd edition*, and *The Insider's Guide to the Colleges 2004*, were also used to locate graduate programs. Institutions that also have undergraduate programs in one or both of the disciplines were also reviewed. These programs were located through extensive Internet searches or suggested via e-mail by study participants and professional discipline-related organizations.

Colleges and universities of all sizes located across the country were reviewed, and an attempt was made to locate and review a majority of the graduate programs in forensic science and criminal justice in order to establish an accurate representation of existing educational opportunities. It was my intention to locate and examine as many

graduate programs as possible within the timeframe of January 2004 – September 2004, under either of the disciplines in an effort to ensure I had reviewed a large portion of programs with an Internet presence. A spreadsheet of the 290 colleges and universities examined was compiled, and is provided in Appendix A.

Departmental homepages and online graduate catalogs for each of the 290 programs were evaluated to determine the mission and goals of the forensic science and criminal justice programs. Course descriptions were examined to insure that all appropriate programs received consideration. Though it is difficult to determine the exact number of graduate programs in the disciplines of forensic science and criminal justice, the conclusion was made that the examination of 290 programs accurately depicts a representation of existing educational opportunities in the disciplines.

I established several criteria that were used to determine whether the programs were relevant to this research:

1. Forensic Science admission requirements: the prerequisite of a Baccalaureate degree in an applied science such as biology or chemistry disqualified the program from further consideration.

2. Forensic Science programs: if the goal was to train laboratory analysts, the program received no further consideration. This research is focused on training crime scene investigators working at law enforcement agencies

3. Criminal Justice programs: if the curriculum reflected a theoretical rather than a practical approach, for example studying the causes of crime or the societal impact of crime, the program was eliminated from consideration.

4. Criminal Justice programs: if the program description defined the targeted audience as individuals whose goal is to become administrators in a criminal justice agency, it was removed from consideration.

Existing forensic science and criminal justice master's programs that appeared comparable to the goal of the proposed forensic investigation curriculum were analyzed to determine whether, indeed, a disconnect exists between available courses and the needs of today's crime scene investigators as defined by the survey results. The findings of this comparison are discussed in Chapter 4.

The information gleaned from this document review was combined with the data analyses of the survey responses and personal interviews to formulate answers to each of the four research questions. These responses are discussed in Chapter 4.

Participant Selection

The National Forensic Academy has been in existence for three years. Of the 129 crime scene investigators who have completed the Academy's ten-week course, 114 are current practitioners. The target population for this study included all of the current practitioners of the Academy and the 37 facilitators affiliated with the program. This population was selected because of their status as practicing crime scene investigators or educators and their affiliation with The University of Tennessee's Law Enforcement Innovation Center. Because this target population represents 34 states and the 10 largest law enforcement agencies in the United States, it provides a representative sample of practitioners who are knowledgeable of available programs across the nation.

Conversations with members from all nine completed sessions of the NFA revealed that the graduates were very cognizant of the limited educational graduate level opportunities for crime scene investigators. Limiting the target population to NFA affiliates provides a sample of knowledgeable potential participants, however it is possible the sample could represent a biased perception because of that affiliation. This variable was included in the limitations of the study.

An e-mail database of the NFA affiliates provided the opportunity to implement the study using the online questionnaire. There was not a method to validate that every survey response that was submitted originated from an NFA affiliate, as the responses were e-mailed without identifiers to ensure participant privacy. However, due to the limited timeframe the survey was online (19 days), and the number of e-mails and telephone calls I received from survey respondents (23 of 44), it is apparent a majority of the respondents were members of the target population.

Survey Instrument

No existing survey instrument was found that would accurately test the perceptions of crime scene investigators in relation to skills, knowledge, and abilities or provide the answers to my research questions. As a result, a multi-section survey was developed based on a review of the literature, existing course contents, and personal conversations with practitioners and Academy facilitators.

The draft survey was submitted to a panel of academicians, practitioners, and law enforcement trainers for review and input. The panel was selected from my professional colleagues who had a mutual interest in the outcome of my study. A list of the review

panel members and their affiliations is provided in Appendix B. The reviewers were informed as to the purpose of the dissertation research and received a draft of the proposed instrument. In order to check the validity of the instrument, the reviewers were asked to consider the following questions:

1. Does the instrument accurately reflect the knowledge, skills, and abilities required of practitioners in the field of crime scene investigation?
2. Are the two categories of course topics inclusive and comprehensive?
3. Will the design of this instrument allow the collection of data necessary to address the four dissertation research questions?

Comments and suggestions submitted by the review panel were incorporated into the questionnaire that was used to conduct a pilot test on July 21, 2004. I presented an overview of the research project to the fifteen members of Session IX of the National Forensic Academy. A printed version of the instrument was distributed to the class, and I remained with the participants to answer any questions and to monitor the amount of time required for the survey. All of the class members completed the survey in about 22 minutes.

The pilot test group identified one area for improvement, which was to alphabetize the course topics lists. The descriptions of the course topics were also alphabetized in order to improve the readability and the user-friendliness of the instrument.

Suggestions from the review panel and the pilot test group were compiled and an improved version of the questionnaire was used for this study. These changes were

incorporated into an online questionnaire that was published on the World Wide Web in the researcher's Volspace account at URL <http://web.utk.edu/~jackiefi/>.

Online Questionnaire

Online questionnaires are a convenient method of gathering information. This method of data collection was employed to reduce the amount of time necessary to conduct the study and encourage participation by providing easy access to the survey.

Other advantages of using an online questionnaire included:

- Accessibility of the website at any time, which increased the opportunities for participation. Crime scene investigators provide their services on a 24-hour basis, and therefore making the survey available via the Internet may have improved the response rate.
- Internet access in law enforcement vehicles and offices is common and readily accessible to the study's target audience.
- Online surveys provide a much more efficient method of data collection and eliminates costly reproduction and postage expenses associated with traditional paper and pencil surveys.
- Notification of the availability of the survey was communicated to the target audience via e-mail addresses maintained by the NFA staff.
- The amount of time necessary to attain a statistically significant response rate was reduced from that of a traditional, paper-based survey.
- Electronic data collection eliminated the receipt of unusable, illegible, or incomplete surveys. The online questionnaire was structured to require

the completion of each field using select data sets. The software did not accept incomplete or incorrect attempts at submission.

- E-mail provided the respondents with the opportunity to contact the researcher or submit suggestions and comments not specifically addressed on the questionnaire.

The Survey Instrument

The online questionnaire was composed of five sections.

- Section 1 – *Demographics* – Demographic information was not part of the statistical data analysis of the study; it was collected to provide a better description of the sample. Examples of the demographic data fields included (1) educational background, (2) years of experience and, (3) major field of study in college. Since law enforcement is a male-dominated profession, the targeted population consisted of primarily male participants (78%). In order to encourage participation and protect the privacy of survey respondents, no gender information was collected.
- Section 2 – *A Skills Identification Checklist* was designed to measure respondent's perception regarding the relevancy of knowledge, skills, and abilities necessary to perform the responsibilities of a crime scene investigator. A 4-point Likert Scale (Essential, Important, Good-to-Know, and Not Essential) was provided for the respondents. The raw data was converted to numbers and processed with SPSS using descriptive statistics. For example, Section II of the questionnaire asked the

respondent to rank the importance of a list of skills to the responsibilities of a crime scene investigator. A selection of “Essential” converted to a score of 4 in the statistical analysis. Responses for the entire category were then averaged, which resulted in a list of skills ranked according to their importance. The higher the average, the more important the practitioner attributed to the skill.

- Section 3 – An *Attitude Scale* was designed to measure the respondent’s perception of the skill level that should be attained by a student upon completion of a graduate level forensic investigation program. A 4-point Likert Scale (Expert, Competent, Familiar, and Not Important) was provided for the respondents. The same process for analysis and ranking was followed that is explained above in Section II. The higher the score, the higher level of skill that should be attained by a master’s level graduate according to the survey respondents.
- Section 4 – A *Semantic Differential Scale* was designed to allow the participant to assign a relevancy rating for the level of inclusion of course topics in the disciplines of forensic science (Category A) and criminal justice (Category B) in a idealized graduate level forensic investigation curriculum. The respondents indicated the points on a continuum that represented their attitudes. Again, a 4-point scale on the continuum with the equivalent answers of (Essential, Important, Good-to-Know, and Not Essential) was provided. Data analysis and ranking followed the same

protocol as presented above in Section II. The higher the score, the more necessary the respondents considered the course topic to be included in the forensic investigation graduate program.

- Section 5 – A *Qualitative Response Area* gave respondents the opportunity to make any suggestions or comments on topics such as (1) skills that were not included on the list, (2) courses or topics not included on the lists, (3) schools that should be examined for existing programs, and (4) any additional questions that should be answered prior to the development of a graduate forensic investigation curriculum. This qualitative data was coded and included in a contextual analysis performed before developing the open-ended interview questions.

A printed version of the online survey is provided in Appendix C.

Study Notification Process

The proposed population for this study was 114 current practitioners and 37 facilitators affiliated with the National Forensic Academy. The Law Enforcement Innovation Center maintains a database of graduate and facilitator contact information and e-mail addresses were listed for 78 graduates and 37 facilitators. These 115 potential respondents became the targeted population for the online questionnaire. A list of all the agencies and organizations represented by the NFA graduates and facilitators is provided in Appendix D.

An e-mail notification to all the accessible population—graduates (78) and facilitators (37) of the National Forensic Academy with e-mail addresses—was

transmitted on August 12, 2004. This message informed the 115 potential respondents of this research project and sought their professional input. A link to the web page was included in the e-mail to facilitate ease of access to the online questionnaire. A copy of the e-mail notification is provided in Appendix E.

Sixteen of the 78 initial e-mail notifications to the graduates were returned as undeliverable with inaccurate E-mail addresses. Telephone and personal conversations with the potential respondents yielded 10 new e-mail addresses, for a total of 72 potential graduate respondents. Table 1 shows, of the 37 facilitator e-mail addresses, 2 were found to be invalid, leaving 35 potential facilitator respondents for a total potential participant group with 107 valid e-mail addresses.

The initial e-mail resulted in 32 responses for a 29.9% rate of return. On August 29, 2004, (17 days later), a second e-mail message was sent to the 107 potential study participants notifying the group of the number of responses received in an effort to stimulate a sense of competition between the number of participants representing each group. The e-mail also served as a reminder that the questionnaire would be taken offline at midnight on August 31, 2004. The initial responses were submitted anonymously via E-mail to the researcher's Lotus Notes mailbox; therefore the entire participant group

Table 1 Target Population E-Mail Address Statistics

Group	Initial	Invalid	Valid	New	Total
NFA Facilitators	37	2	35	0	35
NFA Graduates	78	16	62	10	72
					107

received the second notification. A number of e-mails were received from the participant group indicating they had already completed and submitted the survey. A copy of the second notification is included in Appendix F.

Twelve additional completed questionnaires were received in response to the second notification making a total of 44 respondents and resulting in a 41% response rate. Two facilitators and one graduate reported they were unable to access the online questionnaire due to technical difficulty with organizational firewalls. No other reports of problems were received.

Quality Assurance

To ensure a fail-safe method for receipt and documentation of the online questionnaire responses, a blind copy of every response was forwarded to a second Lotus Notes e-mailbox. Random surveys from my e-mail were compared to the corresponding blind copy survey to ensure validity of the data collection process. Upon verification of process as well as the total number of responses, the duplicate responses were deleted from the second mailbox.

The online survey was available from August 12, 2004 through August 31, 2004. The participant volunteered to participate in the data collection process when the online questionnaire was submitted. The responses were submitted to my e-mail inbox without the e-mail address of the respondent; however, the survey participants had the opportunity to provide their names and contact information if desired. Twenty-three survey participants contacted the researcher via e-mail to request the opportunity to participate as an interviewee and to receive copies of the survey findings.

Throughout the data collection phase, the expertise of The University of Tennessee's Statistical Counseling Center was employed to ensure the data was being collected in an appropriate manner. The survey data were provided in a Microsoft Excel spreadsheet to the Statistical Counseling Center for analysis. The data were exported from the Microsoft Excel spreadsheet into SPSS for statistical analysis by an impartial third party. Results of the SPSS analysis were returned to the researcher for interpretation.

Results of the SPSS analysis of the quantitative data produced descriptive statistics that defined the characteristics of the respondent group and provided accurate measurements of their perceptions by ranking the results in a standard highest to lowest list. Descriptive statistics allow the researcher to explore volumes of numerical data in a summarized format that indicate respondent perceptions in a ranked format. The number of responses in each category is also represented as a percentage of the total number of responses in order to validate the statistical analysis (Miller and Whitehead, 1996). This process allowed comparisons to be made of the responses to the questions and accurately report the results of the questionnaire.

Qualitative data gathered through personnel interviews were interpreted through the process of coding and categorizing. Responses were examined for similarities and differences, and categories reflective of similar concepts are developed. This process allows the dissection of the text and reorganization of the responses to accurately represent the study participants' perceptions (Flick, 1998).

The data analysis of the personal interviews was combined with the statistical analysis of the responses to the online questionnaire. The integration of the data combined with the conclusions drawn from the document review yielded a comprehensive list of topics that are included in the model forensic investigation curriculum that will be presented in Chapter 5 of this dissertation.

Qualitative Data Collection

I validated the quantitative portion of the study by conducting interviews with NFA graduates and facilitators. This step was implemented to eliminate the possibility of a lack of sufficient depth in the data or conflicting evidence, and to provide an enhanced understanding of the perceptions of the respondents. The opportunity for a representative number of interviewees to elaborate on initial responses to the online questionnaire was made known to the targeted population in the initial e-mail notification.

In this study, the collection of qualitative data was conducted through personal interviews, which can, as Yin (1994) points out, provide “insight into a situation.” Interviews also assisted the researcher by identifying other sources of information, such as existing programs or personal insights of the respondents.

I followed the suggestion of Bogdan and Biklen (1992), Glesne and Peshkin (1992), and Spradley (1979), all of whom advocate beginning structured data analysis early in the data collection phase, and using numeric data to “shape” the direction of personal interviews. This line of reasoning led me to study preliminary analysis of the online questionnaire data as a prelude to formulating the semi-structured interview questions. Information gleaned through personal conversations and e-mail discussions

with NFA graduates and facilitators also contributed to the final content and direction of the interview questions.

Open-ended inquiries facilitated further exploration of the participants' perspectives toward the issues under study (Gay and Airasian, 2000). Conversations between the researcher and NFA graduates and facilitators held prior to the interviews indicated a high level of interest in a graduate level forensic investigation program. This interest on the part of the potential participants resulted a high level of response (41.1%) for the online survey. This method also provides the opportunity for both the researcher and the interviewees to construct meaning jointly as the discussion of various topics evolved, as well as identify additional potential sources of information.

Entry

One of my professional responsibilities is being the primary instructional designer for the NFA. During Sessions I – III of the Academy, I was the Program Manager. I am an accepted member of this group because of my professional background as a crime scene investigator as well as a promoter of the original forensic academy concept. The professional and personal relationships among the students myself provided entry and preliminary discussions with several of the NFA graduates and facilitators who indicated high interest and a willingness to participate in this research project.

Interview Sample

Twenty-three NFA graduates and facilitators volunteered for consideration as interview respondents. Eight graduates and two facilitators were selected to participate in the personal interviews based on the size of their agency and geographic location. The

two facilitators represented a large and a small university at opposite ends of the state of Tennessee. One facilitator was a social science professor (representing criminal justice) and the second facilitator was an instructor in the applied sciences (representing forensic science). Eight participants were practitioners employed as crime scene investigators.

Table 2 shows the diversity of the interviewee pool by location, size, and type of agency.

The Interviews

The semi-structured questions below were provided to the participants via e-mail prior to the day of the interview so they would have a better understanding of the goals of the dissertation research study. Participants were also encouraged to write down any questions or suggestions they wanted to discuss during the interview.

The interviews were conducted between September 1 and September 12, 2004.

Due to the location of some participants (Iowa, Oregon, Alabama, Memphis, and

Table 2 Agencies Represented by Agency Breakdown

Agency	State	Number of Officers
Bradley County Sheriff's Office	TN	80
Cocke County Sheriff's Office	TN	18
Des Moines Police Department	IA	374
Hartsell Police Department	AL	30
Knoxville Police Department (2)	TN	430
Maryville Police Department	TN	50
Medford Police Department	OR	94
East TN State University	TN	Not applicable
University of TN Memphis	TN	

Cleveland) five of the interviews were conducted via the telephone. Informed consent forms were provided to each participant prior to the interview. Because five of the interviews were conducted on the telephone, the consent forms were e-mailed and the researcher obtained verbal or e-mail confirmation of the participant's understanding of the content of the informed consent prior to beginning the session.

I conducted ten personal interviews with volunteers from both the student and facilitator participant groups. Nine of the semi-structured interviews were recorded using a digital audio device. The audio recordings provided a verbatim account of the nine sessions. Interview number five was not recorded due to an equipment failure, however, I wrote extensive notes during this session. The interview questions asked of each participant were:

1. What is your job title and where do you work? Are you a sworn police officer, and if so, what is your rank? How long have you worked in law enforcement?
2. Tell me about your formal education. Did you pursue your career based on your undergraduate or graduate program? If so, how?
3. What professional training have you received either as a police officer, crime scene technician or criminal investigator?
4. Do you hold any professional certifications? What are they and how long did it take you to achieve certification? Are there annual requirements to maintain your credentials?
5. Every graduate practitioner, faculty member, and scientist or researcher who has been involved with the National Forensic Academy was invited to participate

in the online questionnaire. Did you complete the survey? In what capacity are you affiliated with the National Forensic Academy?

6. The title I have proposed for the new Master's Level program is "forensic criminalistics." Do you think the title appropriately describes the professional level of crime scene technician that is indicative of a graduate program? Do you have other suggestions or thoughts about "forensic criminalistics?"

7. Some of my colleagues have suggested the word "forensic" automatically leads people to think that I am working on a "hard science" based program. Do you think the historic connotation of the word "forensic" has changed based on the public's perception of television criminal investigation? How do you perceive the word "forensic?"

8. Let's move on to court testimony. Do you have any experience testifying in criminal court in reference to actions or protocols you followed at a crime scene? What is your most successful case and what do you feel contributed to the success?

9. Now think about some of the less than successful cases. How would having a more science-based foundation of principles and scientific knowledge have helped your case in the courtroom?

10. I have provided you with the list of course topics that was included in the online questionnaire. Do you have suggestions for additional topics that need to be included in the list? Do you have any strong feelings that some of the topics are not important for a crime scene investigator, and if so which ones and why?

11. Do you see any benefit to including an internship requirement in this program? Why or why not? What type of internships would you recommend and what length of time should an internship last?

12. Finally, do you see any advantage or disadvantage to this program being developed as a cohort or should it be an individualized program of study?

Throughout the interviews, the researcher formulated additional open-ended questions based on the responses from the participant. This conversational format was used specifically to ascertain additional useful information pertaining to the professional experiences of the participant.

Interview Data Collection

The interview questions were designed to obtain additional information that was not collected in the online questionnaire. The combination of the analysis of data from both the survey and the interviews was used to formulate responses to all four of the research questions.

A large majority of the data for the qualitative portion of this study resides in transcriptions of interviews with the practitioners. Audio recording and transcription increases the accuracy of the data collection (Peräkylä, 1997). The transcriptions of the interviews were used to code the content and categorize the participant's responses.

Summary of Interview Process

The goal of the third phase of the research was to validate the findings of the online survey and expand the depth of my understanding of the respondent's viewpoints. Personal interviews were conducted in an attempt to elicit additional information

regarding the necessary knowledge, skills, and abilities identified by the NFA graduates and facilitators. The interviews were designed to corroborate the reliability and validity of the survey instrument and the literature review by providing the respondents with the opportunity to comment on content and structure, as well as to elaborate on any identified deficiencies in the online questionnaire.

Analysis of the Interviews

The interview transcripts were analyzed for recurring themes utilizing the following steps:

1. The researcher carefully read each transcript for accuracy and to identify preliminary themes that were emerging from the interviews.
2. The themes were coded and categorized. Responses were tallied in each of the categories. The personal notes made during the interviews were used to crosscheck the coding for accuracy.
3. The data sets from the online questionnaire and from the personnel interviews were integrated with findings from the document review. The results were used to interpret and develop of the study conclusions.

Results of the data analysis are reported in Chapter 4 of this dissertation. Chapter 5 provides conclusions and the discussion of the forensic investigation model curriculum.

Reliability and Validity

The procedures proposed by Yin (1994) were followed to establish the construct validity and reliability of the case study. Multiple methods of data collection (survey, interview transcriptions and field notes, and document review) were used in an effort to

enhance the reliability of the study. The combination of quantitative and qualitative data provided internal validity through convergence of the data. External validity was reinforced by the cross-section represented by questionnaire respondents and interview participants.

Chapter 3 Summary

Having filled the roles of graduate student, crime scene investigator, instructional designer, and NFA Program Manager, I bring a unique perspective to this project. My professional background and subject expertise provided the ability to co-construct realities with the study participants throughout the interviews and during conversations at professional gatherings with the target population.

My examination of 290 graduate level courses in forensic science and criminal justice permitted me to determine the current focus of these programs. I then completed a gap analysis comparing the perceived skill levels that graduate students should attain and the content of programs that are currently available to determine the areas where the needs of practitioners are not being met by existing graduate programs.

As an interviewer, I gained additional insight into the complexities faced by crime scene investigators as they are constantly challenged to gain knowledge of new technologies and advances in forensic sciences. As a researcher, I have constructed a study that permits triangulation of the various data results. Using verbatim accounts, field notes, a review of the literature, and the results of the online survey, the data collection and analysis has been validated.

Chapter 4 provides an in-depth report of the data analysis, and Chapter 5 presents my conclusions and recommendations for additional research into this topic. A model graduate level forensic investigation curriculum is also offered for consideration.

Chapter 4

Findings

The purpose of this study was fourfold: 1) to identify the knowledge, skills, and abilities required of today's crime scene investigators, 2) to determine the level of expertise master's graduates should attain, 3) to ascertain the gaps between the necessary skills and the available graduate programs and, 4) to develop a model curriculum that will bridge the gaps between the disciplines of forensic science and criminal justice. Chapter 4 reports the findings of the data collection and analysis.

This study was conducted using a mixed methods strategy; therefore it is necessary to report the findings in three parts. The analysis of the quantitative data gathered through the online questionnaire is reported in Part 1. The results of the qualitative analysis of personal interviews are presented in Part 2. Finally, a summary of the overall findings is provided in Part 3.

Part 1

Quantitative Data Collection

A multi-part survey instrument presented as an online questionnaire was designed to provide a statistical representation of the perceptions of current practitioners in the field of crime scene investigation, and to form a foundation for the development of interview questions for the qualitative portion of this study. Numerical values were assigned to each response; and the results of this statistical analysis have been integrated into Part 1 of this Chapter.

The online questionnaire consisted of 5 sections. Section 1 gathered demographic information. Section 2 was designed to measure the respondents' perception of the importance of skills required of a crime scene investigator. Section 3 determined the level of skills graduate level students should attain prior to completion of a master's program. Section 4 required the participants to review course lists from forensic science and criminal justice and then rank their importance in a forensic investigation curriculum. The purpose of Section 5 was to make available an opportunity for the respondents to provide any additional information they wanted to share with the researcher through free text comment areas.

Section 1 - Demographics of the Study Group

The target audience for the online questionnaire was practitioners affiliated with the National Forensic Academy at The University of Tennessee in Knoxville, either as graduates or as facilitators. All participants were required to provide demographic information about their educational backgrounds, professional experience, and current job classifications. Of the 107 potential participants, 44 chose to participate in this study, yielding a response rate of 41%. 29 of the respondents (66%) were graduates and 15 (34%) were facilitators. Their years of experience ranged from 1 year to 42 years, with an average experience level of 12.6 years. Twenty-seven (61%) of the participants were sworn law enforcement officers, the majority of whom (62%) held the rank of police officer. Table 3 shows the education levels provided by the respondents.

All 44 survey participants reported attending college; 15 (34%) earned a bachelor's degree and 11 (25%) earned at least a master's degree. By far the largest number of respondents (14) declared criminal justice as their major course of study. A

Table 3 Education Level of Interviewees

Level of Education	Participants	Percent
Some College	14	32%
Associate Degree	4	9%
Baccalaureate Degree	15	34%
Masters Degree	11	25%
	44	100%

variety of other majors were also reported including business, education, history, nursing, and psychology.

Seventeen participants (39%) pursued their degrees in Tennessee colleges and universities, while the remaining 27 respondents (61%) studied for their degrees at institutions across the country, from Florida to Oregon, and California to Maryland.

Figure 1 provides a detailed listing of the institutions and demonstrates the diversity of this respondent group.

Section 2 – Skill Relevancy

Research Question 1

What skills do crime scene investigators believe they need to do their jobs?

Section 2 of the online questionnaire included a **Skills Identification Checklist** designed to measure respondents' opinions regarding the relevancy of knowledge, skills, and abilities necessary to perform the responsibilities of a crime scene investigator. The higher the score, the more important the practitioner perceived the skill to be.

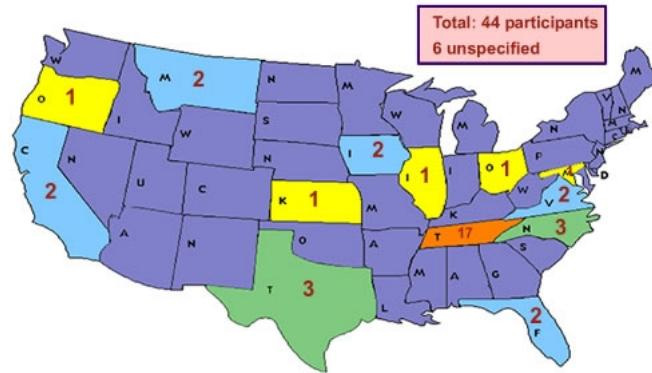


Figure 1 Distribution of Survey Respondents' Colleges Attended

Table 4 on the next page indicates the perceived relevance of the skills to the job responsibilities of crime scene investigators as ranked by the survey respondents.

Section 3 – Graduate Skill Level

Research Question 2

What skills do crime scene investigators expect to gain from an idealized masters program?

An **Attitude Scale** was used to measure the respondents' opinions about the skill level that should be attained by a student upon completion of a graduate forensic investigation program. The higher the score, the higher the level of skill respondents believed should be attained by a master's graduate. Table 5 presents the skill levels as rated by the respondents.

Table 4 Skill Relevance to Job Responsibilities (N=44)

Skills	Min	Max	Mean	Std. Dev.
Evidence Collection	2	4	3.86	0.409
Report Writing	2	4	3.84	0.428
Court Testimony	2	4	3.82	0.446
Photography	2	4	3.75	0.576
Critical Thinking	1	4	3.75	0.615
Scene Interpretation	1	4	3.73	0.624
Organization	2	4	3.64	0.613
Analysis Skills	1	4	3.61	0.689
Latent Print Processing	1	4	3.59	0.923
Communication Skills	2	4	3.57	0.587
Sketching	1	4	3.32	0.829
Computer Literacy	2	4	3.23	0.605
Delegation of Duties	1	4	2.98	0.792
Laboratory Analysis	1	4	2.86	0.795
Document Examination	1	4	2.7	1.025
Fingerprint Classification	1	4	2.41	0.948
Serial Number Restoration	1	4	2.27	0.788

Table 5 Graduate Skill Levels (N = 44)

Skill	Min	Max	Mean	Std. Dev.
Evidence Collection	2	4	3.68	0.561
Critical Thinking	2	4	3.57	0.587
Photography	2	4	3.52	0.628
Report Writing	2	4	3.52	0.628
Analysis Skills	2	4	3.5	0.591
Scene Interpretation	2	4	3.48	0.664
Latent Print Processing	2	4	3.48	0.628
Court Testimony	2	4	3.43	0.625
Communication Skills	2	4	3.39	0.655
Organization	2	4	3.36	0.718
Sketching	1	4	3.3	0.701
Computer Literacy	1	4	3.09	0.603
Delegation of Duties	1	4	2.91	0.709
Laboratory Analysis	1	4	2.82	0.724
Document Examination	1	4	2.73	0.872
Fingerprint Classification	1	4	2.57	0.789
Serial Number Restoration	1	4	2.39	0.689

Section 4 – Course Topic Relevancy

Research Question 3

What courses do crime scene investigators believe will help them develop the skills they need to do their jobs more effectively?

This question was addressed by means of a **Semantic Differential Scale** which allowed the participant to assign a quantitative rating to their views about the degree to which certain course topics should be included in the disciplines of forensic science (Category A) and criminal justice (Category B) in a multi-discipline graduate level forensic investigation program. A mini-glossary containing course descriptions was included to provide a uniform definition of course content. The respondent indicated the point on a continuum that represented his or her attitude. The higher the score, the more necessary the respondent considered the course topic for a forensic investigation graduate program. Table 6 indicates the rankings of the course topics in order of their relevance, as perceived by the respondents.

The respondents to the online questionnaire were presented a total of 41 course topics for consideration. The statistical analysis consisted of a numerical rating on a scale from 4 (high) to 1 (low). The mean for the 41 course topics was 2.5 and 31 of the courses were ranked at or above 2.5. The remaining ten courses fell below the mean and were dropped from further consideration in order to focus on the topics rated as most important by the survey participants.

Table 6 Course Topics Ranked by Priority (N=44)

Rank	Course	Min	Max	Mean	Std. Dev.
1	Evidence Procedures	2	4	3.86	0.462
2	Crime Scene Investigation	2	4	3.84	0.428
3	Death Investigation	2	4	3.75	0.534
4	Court Procedures	2	4	3.68	0.561
5	Ethics & Professional Responsibility	1	4	3.64	0.685
6	Forensic Law: Scientific Evidence	1	4	3.64	0.685
7	Forensic Photography	2	4	3.61	0.655
8	Criminal Procedures	2	4	3.59	0.693
9	Bloodstain Evidence	2	4	3.55	0.663
10	Crime and Law	1	4	3.52	0.698
11	Criminalistics	2	4	3.5	0.762
12	Legal Aspects of Forensic Science	2	4	3.41	0.757
13	Trace Evidence	2	4	3.41	0.726
14	Human Identification	2	4	3.32	0.8
15	Criminal Justice Foundations	1	4	3.32	0.909
16	Scientific Evidence	1	4	3.3	0.878
17	Research Methods	1	4	3	0.889
18	Forensic Comparative Science	1	4	3	0.988
19	Forensic Pathology	1	4	2.98	0.821
20	Human Osteology	1	4	2.98	0.876
21	Lab Measurements & Techniques	1	4	2.91	1.007
22	Victimology	1	4	2.89	0.813
23	Cybercrime	1	4	2.86	0.795

Table 6 Continued

Rank	Course	Min	Max	Mean	Std. Dev.
24	Document Examination	1	4	2.84	0.776
25	Forensic Serology	1	4	2.7	0.795
26	Forensic Entomology	1	4	2.7	0.765
27	Instrument Analysis	1	4	2.66	0.939
28	Forensic Medicine	1	4	2.61	0.97
29	Forensic Psychology	1	4	2.57	0.789
30	Archeology	1	4	2.55	0.697
31	Toxicology-General, Forensic	1	4	2.52	0.821
32	Intro to Forensic Microscopy	1	4	2.45	0.975
33	General Biochemistry	1	4	2.39	0.97
34	Chemistry-Physical, Organic, Inorganic	1	4	2.36	0.917
35	General Pharmacology	1	4	2.34	0.861
36	Biology-Cellular, Molecular	1	4	2.34	0.861
37	Analytical Physics	1	4	2.32	0.934
38	Statistics	1	4	2.32	0.829
39	Analytical Geometry	1	4	2.18	0.843
40	Zoo Archeology	1	4	2.05	0.834
41	Calculus	1	4	1.84	0.834

Section 5 – Qualitative Response Area

A free text area was provided so that survey respondents could enter additional course topics or other pertinent information. Respondents were also encouraged to list criminal justice and forensic science programs that they wanted included in the study.

Research Question 4

What are the differences between the crime scene investigator's idealized masters program and current programs in forensic science and criminal justice?

The examination of 290 college and university graduate programs from across the United States in the disciplines of forensic science and criminal justice confirmed the original premise of this study: there is a gap between the disciplines of forensic science and criminal justice that cannot be bridged by existing programs in higher education. This disconnect prevents the crime scene investigators from acquiring the knowledge, skills, and abilities necessary to perform the responsibilities of their professional positions.

Though forensic science plays a crucial role in the criminal justice system, the discipline consists of a wide range of applied sciences. The survey of existing graduate programs showed that forensic science programs are typically housed in the chemistry and biology departments. An undergraduate degree in forensic science requires completion of courses that build a strong foundation in the natural sciences and include extensive laboratory experience.

The minimum prerequisite for entry into the graduate level forensic science programs reviewed for this study was typically a baccalaureate degree in forensic science or a natural science. Applied science programs are focused on educating students to

conduct laboratory analyses such as serology, DNA, toxicology, and biological examinations, and hold little value for students seeking professions outside the laboratory.

Crime scene investigations are conducted by law enforcement officers and evidence technicians—not scientifically trained laboratory analysts. The NIJ found that the nation’s crime laboratories are overwhelmed by a staggering backlog of requests for physical evidence analyses, which exacerbates the need for more scientifically trained analysts to work in the laboratory, not as crime scene responders. Very few law enforcement agencies or crime laboratories have personnel available who are trained to assist in the collection of evidence at the scene of a crime (NIJ 2003a).

Current criminal justice graduate programs are designed to prepare future agency administrators or students who will continue their studies in pursuit of a terminal degree in the discipline. My examination revealed the majority of criminal justice undergraduate programs do not require the courses in biology and chemistry that are necessary for admission to forensic science programs.

Similarities between graduate level programs in forensic science and criminal justice include the development of critical thinking abilities, problem-solving skills, and advanced discipline-specific knowledge. Components identified in both programs include rigorous academic coursework, a research component, and interaction with the appropriate professional organizations and external agencies including as local crime laboratories and law enforcement agencies.

Of the 290 graduate programs I reviewed, only four institutions clearly attempt to address the disconnect between the disciplines of forensic science and criminal justice. A brief synopsis of the four programs is presented below:

The University of New Haven is focused on improving investigative capacities through a multi-disciplinary forensic science program spanning a wide array of technical and scientific disciplines. Located in the School of Public Safety and Professional Studies, the Graduate Program in Forensic Sciences offers three areas of concentration: Criminalistics, Fire Science, and Advanced Investigation. This last area is focused on students interested in applying forensic science to such professional activities as investigations and crime scene processing. Admission to the program requires students to have earned a baccalaureate degree, but does not require the degree to be in a specific discipline. This program is available in Connecticut and through a satellite campus in Sacramento, California. A summary of the program is provided at this web page:

<http://www.newhaven.edu/psps/gradforensicscience.html>

A Master of Forensic Science degree is offered at Nebraska Wesleyan University. The program is designed for students preparing for three kinds of careers: as investigative analysis/research associate specialists, as criminalists, and as crime scene investigators. The curriculum offers three tracks of emphasis: forensic psychology, forensic biology/chemistry, and general forensics. Applicants with a four-year degree are considered for admission, and there are no other prerequisites for this program. Nebraska Wesleyan University is located in Lincoln, Nebraska. A summary of the program is provided at this web page: http://www.nebrwesleyan.edu/cont_edu/mfs/index.php

George Washington University, in downtown Washington, D.C., has designed a multi-disciplinary curriculum that allows applicants with undergraduate degrees in the behavioral, biological, or physical sciences as well as law, medicine, or law enforcement to pursue a Master of Science in Forensic Science degree. Students and advisors work to set up individualized programs that meet their interests, needs, and background knowledge. The plan of study may include course work from the Law School, the School of Business and Public Management, and The School of Medicine and Health Services. The website for the program is found at:

<http://columbian.gwu.edu/grad/programs.php/id/20>

National University, based in La Jolla, California, offers a Master of Forensic Science degree which features two areas of specialization: Criminalistics and Investigation. The Criminalistics specialization requires an undergraduate degree in laboratory science, while the Investigation specialization requires no specific undergraduate major for admission. The program is, according to the web page, suitable for crime scene and medical examiner death investigators interested in expanding their knowledge and skills in advanced forensic investigations. The web page URL is:

<http://www.nu.edu/Academics/Schools/SOBM/ProfessionalStudies?Degrees?760-000.html?CFID=211621&CFTOKEN=10392486>

Of the 290 programs examined, only four higher education programs were identified by the researcher that have responded to the existing gap between forensic science and criminal justice in higher education. The four institutions have attempted to

bridge the gap by developing graduate programs that acknowledge the lack of integration between the disciplines.

Upon completion of the review of existing programs, the findings from Section 3 (Graduate Skills Levels) of the online questionnaire were compared with the courses offered through the four existing graduate programs in forensic science and criminal justice. Course descriptions from each of the programs were examined to determine if the curriculum contained content that would provide opportunities for graduate students to obtain the knowledge, skills, and abilities identified in the online questionnaire as necessary and relevant to their job responsibilities.

My analysis suggests the four programs currently available to crime scene investigators do not adequately address the skills identified by the study respondents as necessary to perform their job responsibilities. As is shown in Table 7, eight categories of skills are not represented in any of the course descriptions of the four existing graduate programs (report writing, critical thinking, organization, communication skills, sketching, computer literacy, delegation of duties, and serial number restoration). Only two categories, scene interpretation and laboratory analysis, are offered at all four institutions. With a total of 17 categories, the programs definitely lack the range of content that crime scene investigators have identified as essential to the performance of their jobs.

Table 8 displays a representative list of leading university programs that fail to meet the same criteria as the four programs just presented. The table indicates the typical shortcomings of the majority of the programs in this study. Generally, either the goals of the program did not meet the needs of the targeted population, or admission prerequisites

Table 7 Skills Compared to Existing Programs

Ranking	Skill	GWU	NEB	NU	UNH
1	Evidence Collection		X	X	X
2	Critical Thinking				
3	Photography		X	X	
4	Report Writing				
5	Analysis Skills		X	X	X
6	Scene Interpretation	X	X	X	X
7	Latent Print Processing		X	X	
8	Court Testimony	X			
9	Communication Skills				
10	Organization				
11	Sketching				
12	Computer Literacy				
13	Delegation of Duties				
14	Laboratory Analysis	X	X	X	X
15	Document Examination		X	X	
16	Fingerprint Classification			X	
17	Serial Number Restoration				
	Skills Offered by Program	3	7	8	4
	Percentage of Skills	17.65%	41.18%	47.06%	23.53%

GWU – George Washington University
 NEB – Nebraska Wesleyan University
 NU – National University
 UNH – University of New Haven

Table 8 Samples of Programs at Leading Universities

Institution	Degree	Specialty Area	Prerequisites
California State University	MS Criminal Justice	Administration	Baccalaureate degree
	MS Criminal Justice	Forensic Mental Health	Baccalaureate degree
	MA Criminal Justice	Research	Baccalaureate degree
	MS Criminalistics	Physical Sciences	BS Natural or Physical Science
Duquesne University	BS/MS Forensic Science	Science and Law	BS Biochemistry or Biology
John Jay College of Criminal Justice	MA Criminal Justice	Research/Teaching	Baccalaureate degree
	MS Forensic Science	Criminalistics/Laboratory	BS Science
	MS Forensic Science	Toxicology/Laboratory	BS Science
Marshall University	MS Criminal Justice	Research/Leadership	Baccalaureate degree
	Master Forensic Science	Crime Scenes	BS in Biology, Physics General or Organic Chemistry
Michigan State University	MSCJ/Forensic Science	Forensic Chemistry	BS Natural Science, Chemistry, Engineering
	MSCJ/Forensic Science	Forensic Botany	Anthropology
	MSCJ/Forensic Science	Forensic Anthropology	
Sam Houston University	MS Criminal Justice	Program Administration	Baccalaureate degree
	MA Criminal Justice	Research/Teaching	Baccalaureate degree
	MS Criminal Justice	Management	Baccalaureate degree
	MS Forensic Science	Laboratory Services	BS Chemistry, Biology Physics, or Botany

prevented crime scene investigators with a baccalaureate degree in the social sciences from seeking admittance.

Part 2

Qualitative Data Collection

The mixed method strategy for conducting this study involved gathering qualitative information from a group NFA graduates and facilitators who agreed to participate in personal interviews. Qualitative research can provide a depth of insight and information, particularly when the researcher and participants share an understanding of the problem under study. Individual interviews were conducted, analyzed, and are reported here in an aggregate form to preserve confidentiality of the participants. Part 2 presents demographic information and results of the content analysis of the data as they relate to the four research questions.

Preliminary data analysis from the online questionnaire, combined with conversations and e-mail discussions with potential interview participants led to the formation of the interview questions. This qualitative data collection was conducted to increase my depth of comprehension of the respondents' perceptions of the proposed multi-disciplinary forensic investigation program. Initially, 23 practitioners volunteered to contribute their time, knowledge, and expertise to the data collection effort. To keep the study manageable, ten interviewees were selected from a range of geographical locations, sizes and types of agencies they represented.

The group consisted of eight NFA graduates all of whom are practicing crime scene investigators; and two of whom now also support the NFA as facilitators in their

respective fields of expertise. Two university faculty members were also selected to represent the facilitators. All participants were supplied with the proposed questions in advanced of their scheduled interviews, and were asked to provide information about their professional experience, educational backgrounds, current job position and affiliation with the National Forensic Academy. A summary of the demographic information is presented in Figure 2.

Five of the interviews were conducted face-to-face at the participant’s place of employment during a mutually agreed upon time. The remaining five interviews were conducted by telephone due to the impracticality of travel to their locations (Iowa, Oregon, Alabama, Memphis, and Cleveland). Each interviewee was asked the same open-ended questions; the researcher was able to extend the conversation whenever a respondent’s answer or comment provided more substantive content to be discussed.

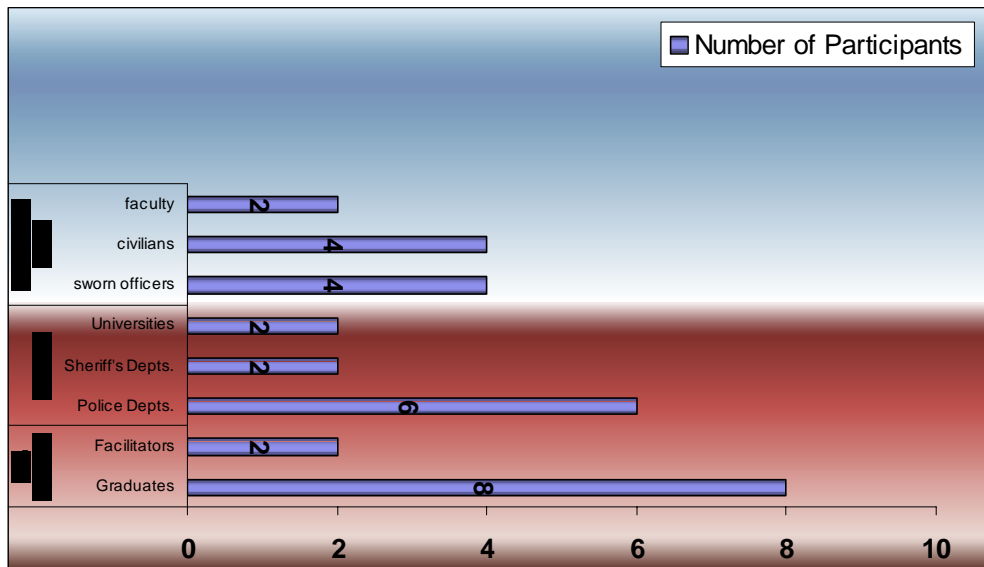


Figure 2 Interviewee Demographics

Summary of Qualitative Data Collection

The interview questions are presented in Table 9 for reference purposes.

Questions 1 and 2 addressed demographic information that has already been reported.

Question 3 asked the respondent to provide a summary of professional training related to law enforcement or crime scene investigation. Four of the interviewees reported having attended Fingerprint Classification training, and three had received training on the Automated Fingerprint Identification System (AFIS). Interestingly, three of the respondents also completed Advanced Arson schools, which also cover fire death investigation. Other specialized training included photography courses, interview and interrogation methods, and advanced death investigation.

Question 4 asked the respondents about their current professional certifications, how long it had taken to achieve those certifications and whether they had to complete annual proficiency testing to maintain the certifications. All four of the sworn officers are required to attend yearly in-service training to maintain their status as certified police officers, although the number of hours varied from 40 (in Tennessee) to 12 (in Alabama). There is no national standard for annual training to be completed by certified police officers, although all of the sworn respondents reported regularly attending more training than is required to maintain their certifications. Two respondents are certified International Association of Identification (IAI) Crime Scene Analysts and one respondent is an IAI Certified Latent Print Examiner. The IAI requires proficiency testing every three years to maintain official recognition of credentials and professional expertise. The two respondents with nursing degrees complete continuing education credits each year to keep their nursing licenses current (12 hours).

Table 9 Interview Questions

Question Number	Interview Question
1.	What is your job title and where do you work? Are you a sworn police officer, and if so, what is your rank? How long have you worked in law enforcement?
2.	Tell me about your formal education. Did you pursue your career based on your undergraduate or graduate program? If so, how?
3.	What professional training have you received either as a police officer, crime scene technician or criminal investigator?
4.	Do you hold any professional certifications? What are they and how long did it take you to achieve certification? Are there annual requirements to maintain your credentials?
5.	Every graduate practitioner, faculty member, and scientist or researcher who has been involved with the National Forensic Academy was invited to participate in the online questionnaire. Did you complete the survey? In what capacity are you affiliated with the National Forensic Academy?
6.	The title I have proposed for the new Master’s Level program is “forensic criminalistics.” Do you think the title appropriately describes the professional level of crime scene technician that is indicative of a graduate program? And, do you have other suggestions or thoughts about “forensic criminalistics?”
7.	Some of my colleagues have suggested the word “forensic” automatically leads people to think that I am working on a “hard science” based program. Do you think the historic connotation of the word “forensic” has changed based on the public’s perception of television criminal investigation? How do you perceive the word “forensic?”
8.	Lets move on to Court testimony. Do you have any experience testifying in criminal court in reference to actions or protocols you followed at a crime scene? What is your most successful case and what do you feel contributed to the success?
9.	Now think about some of the less than successful cases. How would having a more science-based foundation of principles and scientific knowledge have helped your case in the Courtroom?
10.	I have provided you with the list of course topics that was included in the online questionnaire. Do you have suggestions for additional topics that need to be included in the list? Do you have any strong feelings that some of the topics are not important for a crime scene investigator, and if so which ones and why?
11.	Do you see any benefit to including an internship requirement in this program? Why or why not? What type of internships would you recommend and what length of time should an internship last?
12.	Finally, do you see any advantage or disadvantage to this program being developed as a cohort or should it be an individualized program of study?

Question 5 clarified the respondents' affiliation with the NFA and whether they completed the online questionnaire. Eight of the ten respondents were graduates, and two were facilitators. Seven of the ten reported having completed the online questionnaire. Three people could not participate in the online survey for various reasons. One complained of an inability to access the website due to organizational firewalls; one was out of the office and did not receive notification until the deadline had passed, and the third person simply forgot to visit the website until after the deadline.

Question 6 stimulated interesting dialog between the respondents and myself. This question probed the interviewee's personal thoughts on the proposed program title of Forensic Criminalistics. The majority of the respondents supported the title, substantiating their stance with answers such as "Forensics is the catchphrase right now," "I would certainly be interested in a program with that name," and "It may be confusing at first, but I think it would be fine." One person voiced a concern and offered the advice to "drop forensics—just call it criminalistics—at best it is redundant." As a result of these persuasive comments, I changed the name of the program to Forensic Investigation.

The second part of Question 6 asked the respondents for their suggestions as to what title accurately depicts this proposed program. Suggestions such as "Master Forensic Criminalist," "Forensic Analyst," "Forensic Crime Analyst," and "Forensic Investigations" were recommended.

Question 7 enlisted feedback from the participants regarding if and how the historic connotation of the word "forensics" has been changed based on popular television

shows. One participant made an interesting observation when he stated “Throughout the country, law enforcement has been put on trial for what we do out in the field and bring to the courtroom. I think forensics definitely has a major role and needs to be well understood.” Another practitioner stated “We can all thank CSI for all the interest and money coming into our jobs now,” as he reflected on the changes he has experienced as a crime scene investigator over the past three years. He pointed out that training, always considered a luxury in the past, is now considered essential, and that is why he was able to attend the ten-week Forensic Academy. Another example he discussed was the increase in funding to acquire new equipment and additional supplies for crime scene processing.

Conversely, another respondent said, “TV shows are bad. They have created a very unrealistic jury expectation.” One response expanded that line of unrealistic expectations to include “All people now have unrealistic expectations of what we can do on a crime scene.” He went on to tell how his agency had faced undeserved media attention because a tomato that fell out of a burglary suspect’s car was not processed for DNA “like they do on CSI.” And last, but not least, another citizen volunteered to bring his black light to a crime scene investigator to “help him locate latent fingerprints.”

Court testimony was the topic of Question 8. The interviewees were asked to describe successful criminal cases they had presented in court. Five of the respondents defined success as a criminal conviction or guilty plea, though three others considered an arrest of a suspect as a success. Most related cases involving murder investigations; however, the smaller agencies with very few homicide investigations counted success as

making a positive identification using forensic evidence in cases such as computer fraud and identity theft.

To measure the opposite end of the continuum, Question 9 inquired about “less than successful investigations” and whether having a science-based foundation of principles and scientific knowledge would have made the cases more successful. Most of the respondents indicated they had “open” cases where no arrest had been made. Many of those cases have been open for several years, and new technology and more precise techniques have since become standard practice for many crime scene investigators. Two of the respondents voiced concern that the investigations were not successful because officers “did not take that extra step,” or “the crime scene tech did not do the absolute best on everything which allowed the defense attorney to question protocol.” Two practitioners voiced optimism that “you always think you can do better on the next case,” and “you always think of a better answer later.”

Question 10 provided an opportunity for the participants to specifically identify course topics that were not included on the online questionnaire. Topics that were provided by questionnaire respondents were also presented to the interviewees in an effort to substantiate survey input.

Courtroom practices led the list of additions to the suggested course topics. Comments from half of the respondents indicated a strong consensus for inclusion of this subject matter. As one interviewee emphasized “It doesn’t matter how good your physical evidence is if you can’t get it admitted into court.” Two other participants asserted that the course should be taught by practicing defense attorneys and suggested

one of the instructional objectives would be “to teach the students to recognize what the defense is attacking you on.” Three of the five respondents who suggested courtroom practices noted that integrating mock court proceedings would be an effective way to prepare crime scene investigators and suggested videotaping of the student’s performance on the stand to provide a reference tool for the students.

Technological advances in forensic science have made portable laser equipment available to most agencies. Three of the respondents expressed a clear concern that trajectory was an essential course topic, i.e. teaching crime scene investigators to plot the trajectory of bullets with or without the use of lasers. Another use for trajectory involves blood spatter (blood stain pattern analysis), which is effective for determining the veracity of victim/suspect statements. Two participants noted that this course topic is a necessary part of a comprehensive curriculum.

Ballistics and the comparison of shell casings, bullets and cartridge cases was identified as an “up and coming” technology that is more readily available since the Bureau of Alcohol, Tobacco, Firearms and Explosives (ATF) has begun supplying comparison microscopes and the NIBIN (National Integrated Ballistic Information Network) computers that provide database access for regional crime laboratories. This system allows a firearms examiner to enter all suspect or recovered bullets and spent casings into the database for comparison with known samples. The technology has successfully linked weapons to crime scenes and to suspects. Examiners across the nation update the database on a daily basis. The interviewees who had used this tool observed that this technology will have an increased impact on their ability to resolve

cases and proposed that the topic should be incorporated into the forensic investigation curriculum.

Five additional course topics (bombs/explosives, crime scene diagramming, forensic anthropology, footwear/tire impressions, and latent print processing) were mentioned by the respondents as important to their everyday crime scene processing responsibilities. The course topics could be integrated into a multi-discipline practical course, and one respondent espoused the idea of “developing and requiring lab work and a lab manual” to assist students in mastery of these various skills.

Throughout the review of 290 existing forensic science and criminal justice programs, a variety of program requirements for graduation were noted, including thesis, capstone projects, and internships. Question 11 was designed to seek input from the respondents as to whether the model curriculum should include an internship. Pre-service students are those who have not been employed by a law enforcement agency and are not currently practitioners. In-service students are currently practicing crime scene investigators.

A wide range of opinions were voiced, however, the general consensus was that for pre-service students, the internship should be mandatory, while for in-service students, participation in an internship program should be optional. Suggestions for internships included assigning students to the District Attorney’s Office, Bureau of Alcohol, Tobacco, Firearms and Explosives, Federal Bureau of Investigation, the Army Criminal Identification Division’s Laboratory in Atlanta, and the Miami-Dade Crime Scene Investigation Office.

Seven of the ten respondents felt that an internship was an essential requirement for pre-service students, and four of the seven participants suggested that in-service students be required to work in a capacity different than their current job assignment, such as with the Medical Examiner's Office or even with a private company working on advancing crime scene technologies. The general consensus of the group was that providing an opportunity for crime scene investigators to gain insight into protocols followed by other agencies would be a beneficial learning experience.

To follow up on the discussion of necessary components for the model curriculum, the interviewees were asked about the need for students enrolled in a forensic investigation program to complete a thesis, capstone project, or comprehensive examination. Overall, the group responded that comprehensive examinations were decidedly important and would lend credibility to the program. There was a strong consensus among the respondents to allow the student to choose between completing a thesis or capstone project based on the individual interests of the course participants.

Finally, Question 12 explored the interviewees' perception of the importance of designing the forensic investigation curriculum as a cohort-based program. A respondent who could not decide on this issue summarized many of the comments of the interviewee pool by stating, "There are pros and cons to a cohort organization. Some people will do everything and others will let the group carry them and they won't contribute at all." Those who did not support a cohort voiced concern that practitioners, many of whom work rotating shifts, are employed at extra jobs, and have family obligations, may not be able to actively participate in required group activities. One respondent defended her

stance against the cohort model by remarking that she had been involved in successful cohorts in other educational programs, but she would prefer an individualized program for this type of experiential learning environment. She also identified a specific concern with the various learning styles of cohort members that could lead to complications during group exercises.

These comments led me to conclude that the interviewees perceived the concept of “cohort” to mean more than just a group of people who are proceeding through a program of study as a unit. These participants understood the term “cohort” as a group of people who are collectively responsible for completing work that leads to a group grade rather than individual grades.

Five of the participants supported the cohort model and were unanimously supportive of the professional network they built as members of the NFA cohort. All of them said they had “bounced ideas” off other crime scene investigators, and had sought additional advice from their NFA cohort members when confronted with complicated issues. Several of the respondents provided specific examples of using their cohort network to obtain additional expertise on crime scenes they had processed since returning to their agencies upon graduation from the NFA.

Part 3

Summary of the Quantitative and Qualitative Data

The data collection and subsequent analysis for both the quantitative and qualitative portions of this dissertation study have been reported and found to substantiate the premise of the existence of a gap between the disciplines of forensic science and

criminal justice. Further research revealed that of the 290 graduate programs examined, only four programs had curricula that was supportive of the knowledge and training needs of crime scene investigators. Though these four programs appeared, on the surface, to address the higher education needs of crime scene investigators, an in-depth analysis of the course descriptions revealed they addressed less than half of the skills ranked by crime scene investigators as essential to the performance of their jobs. The data analysis indicates the level of skill mastery that graduate students should have attained prior to completion of the forensic investigation program. Again, the four existing programs failed to include topical areas in less than half of these skills. Thus one must conclude that these programs, though more comprehensive than others, are also inadequate and fail to meet the needs of practitioners.

Analysis and synthesis of the statistical data and the qualitative data provided insights as to the course topics that should be integrated into a cross-disciplinary curriculum that meets the needs of crime scene investigators. The top priorities of the study respondents are grounded in the discipline of criminal justice. Components of more than 12 forensic science disciplines must be blended into a comprehensive curriculum that is based on scientific knowledge. Course content must be pertinent to the responsibilities of a crime scene investigator, not simply an adaptation of curricula designed for law enforcement officers and evidence technicians. The additional course topics suggested by the study participants are integrated into the model curriculum that is presented in Chapter 5 of this study.

A cohort-based program was endorsed by half of the interviewees.

Comprehensive exams were unanimously recommended, and internships, theses, and capstone projects were all supported as alternatives that could be chosen by students during the formation of their formal plan of study. The respondents emphasized that various personal interests and job responsibilities should be considered by both the faculty advisor and student, and concurred that providing these options would make the forensic investigation curriculum more versatile and applicable.

In addition to the model curriculum that is proposed in Chapter 5, another product of this study is the compilation of specific sets of knowledge elements relevant to each course topic, which are drawn from my survey of crime scene investigators and review of the existing programs. This information, listed under each of the major course topics in the curriculum, can help decision makers who are challenged to develop and implement forensic investigation programs that address the disconnect between the disciplines of forensic science and criminal justice.

Chapter 5

Conclusions, Discussion and Recommendations

The data collection and analysis efforts discussed above lay the groundwork for a strong recommendation about what should be included in a model curriculum for the development of a forensic investigation master's degree program. Chapter 5 culminates the study by reporting the conclusions based on the data, presenting the model forensic investigation curriculum, and suggesting implications for future studies.

The purpose of this study was fourfold: 1) to identify the knowledge, skills, and abilities required of today's crime scene investigators, 2) to determine the level of expertise master's graduates should attain, 3) to ascertain the gaps between the necessary skills and the available graduate programs and, 4) to develop a model curriculum that can bridge the gaps between the disciplines of forensic science and criminal justice.

The findings reported in Chapter 4 are products of an online questionnaire, personal interviews with practitioners, and a review of 290 graduate level programs in forensic science and criminal justice. Four research questions formed the foundation for the study:

1. What skills do crime scene investigators believe they need to do their jobs?
2. What skills do crime scene investigators expect to gain from an idealized masters program?
3. What courses do crime scene investigators believe will help them develop the skills they need to do their jobs more effectively?

4. What are the differences between the crime scene investigator's idealized masters program and current programs in forensic science and criminal justice?

The study was conducted using a mixed methodology that yielded quantitative data from an online survey of practitioners and qualitative data gathered through personal interviews with crime scene investigators and educators. The conclusions have also been informed by a review of 290 master's degree programs in forensic science and criminal justice that were available across the United States during the Fall semester of 2004.

A comprehensive list of skills essential for professional competency in crime scene investigators was developed and integrated into the online questionnaire. These skills were then rated in two contexts – first, by the importance of the skill to job performance, and secondly, by the level of competence a graduate from a master's level program should achieve upon completion of the program.

Course topics from the disciplines of forensic science and criminal justice were compiled after an examination of currently available graduate programs. The respondents ranked each of the course topics based the importance of the topic to the forensic investigation curriculum.

Statistical and contextual analysis of both data sets provided information for the summary of the perceptions of the target population. These findings were then compared to the results the review of 290 graduate level programs to determine whether an educational gap existed between the two disciplines. Triangulation of the data gathered from the online questionnaire, personal interviews, and the literature review established the validity of the findings.

The expected disconnect between the disciplines of forensic science and criminal justice was confirmed. The skill set defined by practitioners was compared to the course offerings of four existing graduate programs ascertained through the literature review as being targeted to the needs of crime scene investigators. The existing programs addressed less than half of the skills identified by the practitioners in the research study.

Existing course topics were integrated with the components identified as missing from the four programs to formulate a proposed curriculum for a master's level program in forensic investigation. This model curriculum bridges the gap that currently exists between the disciplines of forensic science and criminal justice, and is primarily directed to meet the needs of current and future crime scene investigators seeking a graduate degree in the social sciences.

Summary of Findings

Research Question 1

What skills do crime scene investigators believe they need to do their jobs?

To determine the skills crime scene investigators perceive to be essential to the effective performance of their job responsibilities, participants rated a list of skills. Using a four-point Likert Scale, the respondents rated the skills as shown in Table 10.

Research Question 2

What skills do crime scene investigators expect to gain from an idealized masters program?

Survey respondents were asked to rate the level of expertise that should be

Table 10 Skill Relevance to Job Responsibilities

Rank	Skill
1	Evidence Collection
2	Report Writing
3	Court Testimony
4	Photography
5	Critical Thinking
6	Scene Interpretation
7	Organization
8	Analysis Skills
9	Latent Print Processing
10	Communication Skills
11	Sketching
12	Computer Literacy
13	Delegation of Duties
14	Laboratory Analysis
15	Document Examination
16	Fingerprint Classification
17	Serial Number Restoration

attained by a graduate prior to completion of an idealized forensic investigation master's degree program. The results are shown in Table 11.

The ranking of skills by the practitioners was compared to the perceived level of mastery that graduate students should attain upon completion of a forensic investigation program. There was a high correlation between the categories of essential skills and the expected level of mastery. Figure 3 graphically depicts the correlation based on the mean values of the skills and comparisons of perceived relevance.

Table 11 Graduate Skill Levels

Rank	Skill
1	Evidence Collection
2	Critical Thinking
3	Photography
4	Report Writing
5	Analysis Skills
6	Scene Interpretation
7	Latent Print Processing
8	Court Testimony
9	Communication Skills
10	Organization
11	Sketching
12	Computer Literacy
13	Delegation of Duties
14	Laboratory Analysis
15	Document Examination
16	Fingerprint Classification
17	Serial Number Restoration

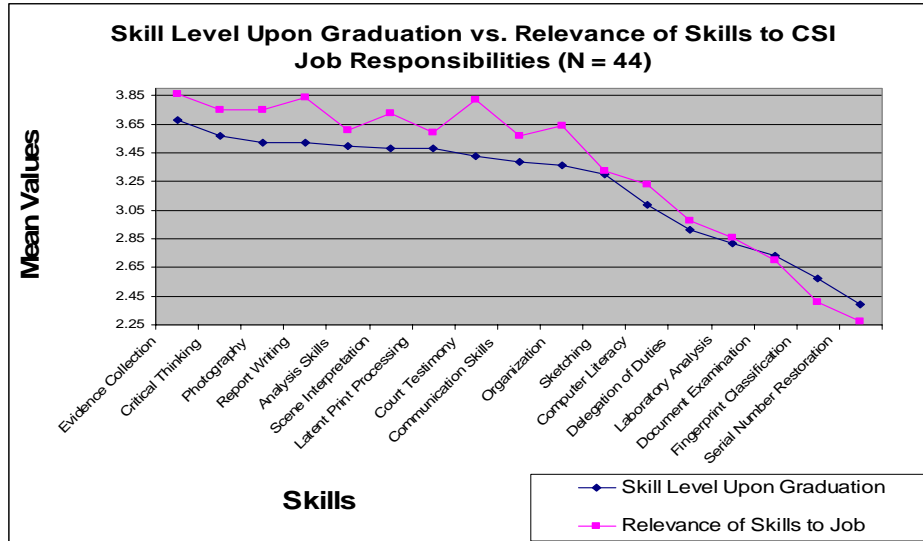


Figure 3 Skill Level Comparison to Skill Relevance

Research Question 3

What courses do crime scene investigators believe will help them develop the skills they need to do their jobs more effectively? Respondents were provided with a description of course content for each of the course topics in the disciplines of forensic science and criminal justice and asked to indicate the need for the course topic in a graduate level forensic investigation program. The findings are provided in Table 12.

Research Question 4

4. What are the differences between the crime scene investigator’s idealized masters program and current programs in forensic science and criminal justice?

An examination of the 290 programs reviewed, only four institutions had recognized the deficiencies and had developed graduate programs that were geared to meet the needs of

Table 12 Course Topics Rankings

Ranking	Course Topic
1	Evidence Procedures
2	Crime Scene Investigation
3	Death Investigations
4	Court Procedures
5	Ethics & Professional Responsibility
6	Forensic Law: Scientific Evidence
7	Forensic Photography
8	Criminal Procedures
9	Bloodstain Evidence
10	Crime and Law
11	Criminalistics
12	Legal Aspects of Forensic Science
13	Trace Evidence
14	Human Identification
15	Criminal Justice Foundations
16	Scientific Evidence
17	Research Methods
18	Forensic Comparative Science
19	Forensic Pathology
20	Human Osteology
21	Lab measurements & Techniques
22	Victimology
23	Cybercrime
24	Document Examination
25	Forensic Serology
26	Forensic Entomology
27	Instrument Analysis
28	Forensic Medicine
29	Forensic Psychology
30	Archeology
31	Toxicology-General, Forensic

crime scene investigators. A closer review of course descriptions of the four programs reveals that the curricula meet less than half of the educational needs of current practitioners.

Further discussions combined with input from the survey respondents resulted in an additional list of course topics the participants felt needed to be integrated into the curriculum. The topics are listed in Table 13 in the order they were ranked.

Conclusions

This study was conducted to confirm my perception that a gap exists in higher education between the disciplines of forensic science and criminal justice. Data were gathered that would lead to design of a graduate level forensic investigation curriculum that could provide the foundation for the knowledge, skills, and abilities required by crime scene investigators to perform their job responsibilities effectively. From this study, it seems reasonable to conclude:

Table 13 Additional Courses Suggested by Respondents

Additional Course Topics
Courtroom Practices
Arson/Fire Investigation
Trajectory Plotting
Ballistics
Blood Spatter
Bombs/Explosives
Crime Scene Diagramming
Forensic Anthropology
Footwear/Tire Impressions

- Due to advances in technology, forensic science is playing a major role in the American criminal justice system. However, institutes of higher education have failed to recognize the gap has opened, thanks to advances in scientific knowledge and technology, between the disciplines of forensic science and criminal justice.
- Crime scene investigators are aware of the need for developing a higher level of knowledge, skills, and abilities that will assist them in accurately processing crime scenes, by collecting, and preserving physical evidence that can be scientifically-analyzed by crime laboratories.
- An examination of 290 graduate program websites in forensic science and criminal justice confirmed the original perceived disconnect between the disciplines.
- No existing graduate programs provide crime scene investigators with the foundation necessary to develop the knowledge, skills, and abilities required to take advantage of the advances in science and technology. Four programs are available in three states: one in Nebraska, one in Connecticut, and two in California. These programs provide less than half of the course content that crime scene investigators who participated in this study believe is required to meet the needs of practitioners.
- There is a need for a forensic investigation program that integrates the scientific knowledge base with criminal justice practices to provide a multi-disciplinary curriculum for a graduate level program. This curriculum should 1) address the skills required by crime scene investigators, 2) incorporate scientific and

technological advances into applicable methodologies, and 3) address the disconnect between the disciplines of forensic science and criminal justice in higher education by building the necessary skills and knowledge base of the students.

Discussion

High profile criminal cases and popular television shows captivate the public—thus creating unrealistic expectations of the capabilities of crime scene investigators. Yet higher education has failed to provide graduate level training that adequately prepares crime scene investigators to incorporate these advances into standard protocols. At the same time, technological advances and scientific discoveries are, in fact, improving the capabilities of crime scene investigators. Traditionally, the criminal justice system and the nation's universities are slow to react and tend to remain on the backside of a quickly changing criminal environment.

Governmental agencies have begun to provide financial resources that will increase the pace of the development of technologies—particularly in the area of DNA research and its application to forensic evidence analysis. It is important that graduate programs include the curricula that will meet the needs of professional practitioners. The nation's colleges and universities must recognize the disconnect that currently exists between the disciplines of forensic science and criminal justice and equitably distribute resources to develop programs that will attract additional graduate students to their programs.

An extensive DACUM (development of curriculum) must precede the recruitment of students into existing graduate programs. This comprehensive analysis will require academicians to seek extensive input from practitioners in order to integrate key concepts into each course. Subject matter experts, representing both the disciplines of criminal justice and forensic science as well as crime scene practitioners and laboratory analysts, must participate in the development of the content for this model curriculum.

Because of the myriad of areas that must be included in the forensic investigation curriculum, instructional designers must also recognize the need to develop the courses for delivery in an experiential learning environment. A high consensus exists among the study participants that many of the skills necessary for processing a crime scene must be taught through practical application. These skills can be developed during laboratory exercises and mock crime scene investigations.

The design of the proposed model curriculum that is presented in the following section was guided by the constructivist approach to learning, that is, the students must actively engage themselves in the cognitive process and construct knowledge by connecting existing knowledge with new learning. This metacognitive style allows the students to incorporate their real-world experiences into the program.

The constructivist paradigm design of this study lends cohesion to the development of the model curriculum for the forensic investigation program and reinforces Ornstein and Hunkins (1993) belief that no ultimate shared reality exists because reality is the result of each individual's constructivism. Every course participant's cognitive processes have been formed through their experiences. There is

no consensus on how the students ultimately create their individual reality, however, according to Ornstein and Hunkins, an instructional designer can provide the map that can guide learners to the development of metacognitive skills.

The capstone product of this dissertation is the presentation of a model curriculum for a graduate level forensic investigation program. The main goal of this curriculum is to broaden the knowledge base of crime scene investigators. The anticipated result, the creation and implementation of a forensic investigation graduate program will produce highly trained and well-educated crime scene investigators who understand and practice standard protocols when dealing with evidence custody issues.

Outcomes

The public's need for educated criminal justice professionals is increasing. There is a general perception that human error and omission are the primary correctable problems that cause physical evidence to be inadmissible in court (Penn, 2003). It is therefore important for higher education to provide professional programs for crime scene investigators in an attempt to circumvent the potential adverse consequences of releasing criminals into our society attributed to poorly processed crime scenes or overlooked physical evidence. Successful prosecution relies on crime scene investigators with knowledge, skills, and abilities that include an understanding of the principles of scientific protocols and the potential impact of scientific analysis of physical evidence on the successful prosecution of crimes.

To eliminate the gap between the disciplines of forensic science and criminal justice, practitioners have identified skills and course topics to be integrated into a

proposed multi-disciplinary curriculum. The program can develop competent and skilled crime scene investigators and contribute to the overall criminal justice system by promoting excellence in the identification, collection and preservation of physical and forensic evidence.

Inferences and conclusions used to establish the goal and principles upon which the curriculum is based were drawn from the data analysis of practitioners' input. The results strongly supported a core curriculum that would integrate criminal justice and a scientific knowledge base. The core curriculum should be designed to present a holistic, multi-disciplinary and practical advanced program of study responsive to the needs of professional crime scene investigators and the American criminal justice system.

Forensic science has become an integral part of the investigative and legal processes that ultimately lead to the truth. The criminal justice system is experiencing the effects of rapidly changing technology. The core courses will merge the concepts and principles of both disciplines while establishing a solid foundation for the forensic investigation program.

It is suggested that classroom work, appropriately blended with scientific and technical knowledge, presented in an experiential learning environment can affirm Dewey's (1938) assertion that "all genuine education comes about through experience." An authentic learning environment, according to Brown, Collins, and Duguid (1989), provides a situated learning experience. The courses in the model curriculum will provide students with the opportunity to learn and practice, and, as Ross and Ogbonnaya

(2002) suggest, will facilitate the transference of skills from the classroom and laboratory environment to the real work environment.

The Model Program

Fifteen semester hours are required to complete the core curriculum. Prior to the completion of the core curriculum, students must select graduate advisors and develop individualized plans of study appropriate to their goals. A minimum of fifteen additional hours of elective courses will lead to the final phase of the program. When developing the plan of study, each student must select to complete 1) a thesis, 2) a practical applications project, 3) an internship, or 4) additional coursework (9 hours). Pre-service students will be required to complete an internship at an agency consistent with the type of services essential to the career goals of the participant. In-service students may choose any of the other options or complete an internship in an agency delivering services different from the ones of the participant's current employer.

According to the model program, each student will select 15 hours of elective courses. These courses will provide a variety of challenges through by the practical application of new skills through mock crime scene investigations. Laboratory assignments and mock trial appearances will also be integrated into coursework in an attempt to close the gap between theory and practice.

At this time, the researcher does not recommend starting a group of students together in the program with a definitive timeline and course schedule as is often found in a cohort. The interviewees were equally divided as to whether they would recommend a cohort for the forensic investigation program. As the implementation progresses,

organizing new program entrants into a cohort may prove conducive to learning, and should be considered based on feedback from the initial students who graduate from the program.

The end product—the model curriculum—is based on the criterion expressed by practitioners and exemplifies the course topics as ranked in the online questionnaire and personal interviews. Table 14 provides a cross reference of the courses and the skill level that should be attained by graduates of the master’s level program. A complete outline of the proposed model curriculum for the forensic investigation program is provided in Appendix G.

Model Curriculum Summary

The proposed model curriculum incorporates the range of scientific knowledge and investigative techniques revealed through this study as essential to performance of the job responsibilities of a crime scene investigator. Forensic investigation graduates will be competent to assume positions with law enforcement agencies or on medical examiners’ investigative teams. They may also be positioned to pursue doctorate degrees. The scientific and technical components are combined in a multi-disciplinary comprehensive approach designed for both pre-service and in-service students. The program should be part of a social science department, as it is not an applied science degree. The variety of elective courses allows in-service students to gain additional knowledge and experience in areas where prior educational opportunities were scarce. Pre-service students will build an understanding of the possibilities of scientific evidence collection and analysis and their application to crime scene investigation.

Table 14 Skills and Courses Cross Reference Chart

Graduate Forensic Investigator Skills	Evidentiary Protocols	Comp. CS Management	Contemp. Crim. Just.	Law and Order	Intradisciplinary Studies	Ethics & Professional Resp.	Death Investigation	Forensic Law	The Burning Questions	Body Fluids	Crime Lab Capabilities	Skeletal Remains	Without a Trace	Electronic Crime Scene	The Profilers	General Investigations
Evidence Collection	◆	◆					◆		◆	◆		◆		◆		◆
Critical Thinking		◆	◆	◆		◆	◆	◆	◆		◆	◆		◆	◆	◆
Photography	◆	◆					◆		◆	◆		◆		◆		◆
Report Writing		◆	◆		◆	◆	◆		◆	◆		◆		◆	◆	◆
Analysis Skills	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
Scene Interpretation		◆					◆		◆	◆		◆		◆	◆	◆
Latent Print Processing	◆						◆		◆					◆		◆
Court Testimony	◆	◆		◆			◆	◆	◆	◆	◆	◆		◆	◆	◆
Communication Skills	◆	◆	◆	◆			◆		◆			◆		◆	◆	◆
Organization	◆	◆	◆	◆	◆		◆		◆			◆	◆	◆	◆	◆
Sketching	◆	◆					◆		◆	◆		◆		◆		◆
Computer Literacy			◆	◆	◆					◆	◆		◆	◆	◆	◆
Delegation of Duties		◆					◆		◆	◆		◆			◆	◆
Laboratory Analysis								◆	◆	◆	◆			◆		◆
Document Examination	◆															◆
Fingerprint Classification	◆															◆
Serial No. Restoration	◆															◆

Though this program presents a well-rounded cross-disciplinary approach to modern crime scene investigation, completion of the program requirements will not make experts of the graduates. Only job experience and experience giving courtroom testimony can fully develop the knowledge, skills, and abilities that will lead to judicial recognition and acknowledgement of subject matter expertise.

Implementation of the proposed forensic investigation graduate curriculum should help to insure that justice is served; the aim is not to guarantee that there will be courtroom success in every prosecution. The goal of the professional crime scene investigator should always be the same as the mission statement of the Tennessee Bureau of Investigation, which is “That guilt shall not escape, nor innocence suffer” (Tennessee Bureau of Investigation, 2002).

These research findings are presented based on the opinions and perceptions of crime scene investigators affiliated with the NFA during the study period of January – September 2004. No survey instrument can reveal absolute truth. The interview process does not automatically reflect the accurate and unchanging perceptions of the study participants (Johnson, et al. 1999). It is entirely possible that additional graduate programs exist or will be introduced that would better address the needs of modern practitioners given the fluidity of technology and the need for the institutes of higher education to implement programs that will attract new students. However, every effort has been made here to provide a comprehensive picture of the current state of affairs and to develop a well-founded plan to address unmet needs.

Implications for Further Research

Geissler (1996), expounded on a societal need driving the expansion of educational opportunities by stating, “mad cow disease pushes up the numbers attending vegetarian cooking classes.” The same theory can be applied to this research study. Though advancing technologies and scientific discoveries are creating new ways for crime scene investigators to identify, collect, and preserve evidence, the criminal element is also utilizing that new knowledge to commit more sophisticated criminal acts against society.

Some researchers, according to Whitson and Amstutz (1997), predict that new information will soon double every 20 months. Not only must forensic investigation programs be established, but also program administrators must insure that course content stays up-to-date, and that practical application courses keep pace with advancing knowledge. Apps (1988), speculates that half of what students have learned during their undergraduate education will be outdated in five years, and the shelf-life of knowledge could even be reduced to months in fields where technology plays a large role.

Generating stronger evidence must remain a priority of both the forensic science and criminal justice disciplines. More precise forensic tools will benefit every facet of the criminal justice system. For example, DNA technology is quickly permeating every type of crime scene investigation, and academicians must pursue these advances and incorporate them into criminal justice and forensic science courses.

Future studies should continue to explore the perceptions of forensic investigation program participants. Graduates should be surveyed regularly to determine the long-term

impact of their advanced training upon the outcome of forensically-based criminal trials to determine if there is a measurable increase in the number of convictions obtained through the use of more sophisticated evidence collection procedures.

Advancing technologies have created the current gap between the disciplines of forensic science and criminal justice. The literature must be continually examined for new processes and techniques from other disciplines that need to be integrated in order to maintain the accuracy and timeliness of the curriculum. The learning environment must also be upgraded as technology and court rulings impact the criminal justice system.

The United States Attorney General is in the process of establishing a Forensic Science Commission that will study rapidly advancing technologies and knowledge (NIJ, 2004). The academic community should seek representation on that Commission. The needs of students, educators, and practitioners in the disciplines of Forensic Science and Criminal Justice must be brought to the attention of the new Commission in an effort to address the confirmed disconnect between the disciplines.

To preserve the veracity of evidence, it is essential that crime scene investigators receive the best training and advanced education possible. The model curriculum proposed here is a step in that direction. These words from Herbert L. MacDonell remind us of the critical role that forensic investigation plays in the service of justice; and the critical need to continually develop crime scene investigators' skills:

You can lead a jury to the truth but you can't make them believe it. Physical evidence cannot be intimidated. It does not forget. It doesn't get excited at the moment something is happening – like people do. It sits there and waits to be detected, preserved,

evaluated, and explained. This is what physical evidence is all about. In the course of the trial, defense and prosecuting attorneys may lie, witnesses may lie, the defendant certainly may lie. Even the judge may lie. Only the evidence never lies.

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Appendix A

Graduate Programs in Forensic Science and Criminal Justice

College or University	Forensic Science Degree Programs
Albany State University, Georgia	MSCJ/Forensic Science http://asuweb.asurams.edu/artsci/CJ/degrees.html
Arcadia University	MSFS http://www.arcadia.edu/default.asp?t=1&m=3392:-1&pmid=1&pid=2223
California State University, Davis	MSFS http://gradstudies.ucdavis.edu/programs/forsci.htm
California State University, Los Angeles	MS Criminalistics http://www.calstatela.edu/dept/crim_jus/MSdegree.htm
Duquesne University	MSFA and Law http://www.forensics.duq.edu/academicprograms/forensicmasters.html
Duquesne University	MS Forensic Nursing http://www.forensics.duq.edu/academicprograms/nursingmasters.html
Florida International University	MSFS http://bchhs.yzu.edu/dcj/dcj500.html
Forensic Sciences and Computer Education Center, Arkansas	MSISM/FS http://www.cji.net/CJI/CenterInfo/fscec/masters.htm
George Washington University	MFS http://columbian.gwu.edu/grad/programs.php/id/20
John Jay College of Criminal Justice, CUNY	MSFS http://www.jjay.cuny.edu/programsGraduate/progGraduateDegrOffe.asp
Louisiana State University	MA Anthropology http://www.lsu.edu/faceslab/education/ma.htm
Marshall University	MSFS http://www.marshall.edu/www/grad.asp
Mercyhurst College	MS Forensic and Biological Anthropology http://www.mercyhurst.edu/graduate/academic-programs/index.php?
Michigan State University	MSFS http://www.forensic.msu.edu/
National University	MFS http://www.nu.edu/Academics/Schools/SOBM/ProfessionalStudies/Degrees

Colleges and Universities	Forensic Science Degree Programs
Nebraska Wesleyan University	MS Forensic Science http://www.nebrwesleyan.edu/cont_ed/mfs/index.php
Oklahoma State University, Tulsa	Master of Forensic Sciences Administration http://www.healthsciences.okstate.edu/forensic/mfsa.htm
Oklahoma State University, Tulsa	MSFS http://www.healthsciences.okstate.edu/forensic/ms.htm
Pace University	MSFS http://appserv.pace.edu/execute/page.cfm?doc_id=3747
Philadelphia College of Osteopathic Medicine	MS Forensic Medicine http://www.pcom.edu/Academic_Programs/academic/Degree_Programs
Saint John's University	MS Toxicology http://new.stjohns.edu/academics/graduate/pharmacy/gradprograms/masters.sju
Sam Houston State University	MSFS http://www.cjcenter.org/College/forensic/
State University of New York at Albany	MS Forensic Molecular Biology http://www.albany.edu/biology/forensics/index.html
Tiffin University	MCJ/Forensic Psychology http://www.tiffin.edu/livepages/1234.shtml
Touro College	MS Forensic Examination http://www.touro.edu/shs/forensicexamination.asp
University of Alabama at Birmingham	MSFS http://www.uab.edu/justice/html/master_s_program_in_forensic_sciences.html
University of California, Davis	http://universityextension.ucdavis.edu/forensics/index.asp
University of Central Florida	MS Chemistry/Forensic Science http://reach.ucf.edu/~forensic/main.html
University of Central Oklahoma, Edmond	MSFS http://www.chemistry.ucok.edu/Masters/Masters2.htm
University of Denver, Colorado	MAF Psychology http://www.du.edu/gsp/MAFPMMain.htm
University of Florida	MAF Anthropology http://web.anthro.ufl.edu/c.a.poundlab/

Colleges and Universities**Forensic Science Degree Programs**

University of Illinois at Chicago	MSFS
http://www.uic.edu/pharmacy/depts/forensicsci/forensicsci.html	
University of Maryland, Baltimore	MS Pathology
http://www.ubalt.edu/study/graduate/criminal_justice.html	
University of Mississippi	MA Anthropology
http://www.olemiss.edu/depts/graduate_school/Catalogs/2003gradcat.pdf	
University of Montana-Missoula	MAF Anthropology
http://www.umt.edu/grad/programs/anthropology/default.htm	
University of New Haven	MSFS
http://www.newhaven.edu/psps/gradforensicscience.html	
University of North Texas Health Science Center, Fort Worth	MS Forensic Genetics
http://www.hsc.unt.edu/education/gsbs/disciplines.cfm#fgen	
University of Southern Mississippi	MA/MS Anthropology
https://www.usm.edu/gradapp/html/masters.html	
Virginia Commonwealth University	MSFS
http://www.has.vcu.edu/forensics/masterofscience.html	

College or University	Criminal Justice Degree Programs
Albany State University	MSCJ http://asuweb.asurams.edu/artsci/CJ/index.html
Albany State University, Georgia	MSCJ/Law Enforcement http://asuweb.asurams.edu/artsci/CJ/degrees.html
American International College	MS http://www.aic.edu/pages/519.html
American Military University	MA http://www.apus.edu/AMU/Academics/SubPrograms.aspx?paid=133
American University	MSCJ http://www.aic.edu/pages/519.html
Andrew Jackson University	MS http://www.aju.edu/mscj.htm
Anna Maria College	MSCJ http://www.annamaria.edu/Academics/DPS_Grad_CE/dpsindex.htm
Anna Maria College	MSJA http://www.annamaria.edu/Academics/DPS_Grad_CE/dpsindex.htm
Arizona State University West	MA http://www.west.asu.edu/chs/macj/overview.htm
Armstrong Atlantic State University	MSCJ http://www.armstrong.edu/Administration/grad_catalog/cat/art_science
Ashworth College	MSCJ http://masters.ashworthcollege.edu/academic/mmj/
Auburn University Montgomery	MS Justice and Public Safety http://www.aum.edu/Academics/Schools/Sciences/Graduate_Programs
Ball State University	MPA/Criminal Justice and Criminology http://www.bsu.edu/gradschool/article/0,1894,42238-5385-12460,00.html
Boise State University	MA http://cja.boisestate.edu/m_a.htm
Boston University	MSCJ http://www.elearners.com/online-degree/5001.htm
Bowling Green State University	MSCJ http://www.bgsu.edu/colleges/gradcol/programs/criminaljustice.html

College or University	Criminal Justice Degree Programs
Bridgewater State College http://www.bridgew.edu/Catalog/GradSchl.pdf	MS
Bridgewater State College http://www.bridgew.edu/socj/criminaljustice.cfm	MSCJ
Buffalo State College, SUNY http://www.buffalostate.edu/pdf/factsheets_grad/CRMJ_15_fs.pdf	MS
California State University, Fresno http://www.csufresno.edu/gradstudies/narratives/criminology-prog.htm	MS Criminology and CJ
California State University, Los Angeles http://www.calstatela.edu/dept/crim_jus/MSdegree.htm	MSCJ
California State University, Sacramento http://www.hhs.csus.edu/CJ/index.htm	MSCJ
California State University, San Bernardino http://gradstudies.csusb.edu/criminal.html	MA
California State University, Stanislaus http://cjwww.csustan.edu/cj/macj.html	MACJ
California State University, Long Beach http://www.csulb.edu/web/colleges/chhs/ada/crim/degrees.htm	MSCJ
Capella University http://www.capella.edu/reborn/html/schools/humanserv/crim_just_mstr.aspx	MS Human Services/Criminal Justice
Central Connecticut State University http://www.ccsu.edu/grad/criminal_justice.htm	MS
Central Missouri State University http://www.cmsu.edu/cj/index.html	MS
Chaminade University of Honolulu http://www.chaminade.edu/admissions/grad/mscja.php	MSCJA
Charleston Southern University http://www.csuniv.edu/version3/academics/graduate.asp	MS
Chicago State University http://www.csu.edu/criminaljustice/programs.htm	MS
Clark Atlanta University http://www.cau.edu/	MACJ
College of William and Mary http://www.wm.edu/tjppp/acagrad.php	Master of Public Policy/Criminal Justice

College or University	Criminal Justice Degree Programs
Colorado Technical University Denver	MS Management/Criminal Justice http://www.ctu-denver.com/programs/#7d
Colorado Technical University Sioux Falls	MS Management/Criminal Justice http://www.ctu-siouxfalls.com/programs/master_criminal_justice.asp
Columbia College	MSCJ http://www.ccis.edu/graduate/academics/degrees.asp?54
Columbus State University	MPA/Justice Administration http://academics.colstate.edu/catalogs/2004-2005/reqs
Coppin State University	MSCJ http://www.coppin.edu/gradcriminal/criminal.asp
Defiance College	Master of Bus. & Org. Leadership/CJ http://www.defiance.edu/pages/cap_MBOL_CJ.html
Delta State University	MSCJ http://www.deltastate.edu/%7Eartsci/degpro.htm
Drury University	MACr http://www.drury.edu/multinl/story.cfm?ID=280&NLID=94
Drury University	MSCJ http://www.drury.edu/multinl/story.cfm?ID=280&NLID=94
East Carolina University	MSCJ http://www.ecu.edu/gradschool/results.cfm?id=99
East Central University	MS Human Resource/Criminal Justice http://www.ecok.edu/academics/schools/grad_studies/mshr/grad
East Tennessee State University	MA http://www.etsu.edu/crimjust/programs/masters.htm
Eastern Kentucky University	MSCJ http://www.justice.eku.edu/graduate/CJGRAD.htm
Eastern Michigan University	MACRM http://www.sac.emich.edu/
Fairmont State College	MSCJ http://www.fscwv.edu/schools/socsci/cj/news_1.html
Ferris State University	MSCJA http://www.ferris.edu/htmls/fsucatlg/coursecatalog/programs.cfm?
Fitchburg State College	MSCJ http://www.fsc.edu/crimjustice/grad_manual.htm

College or University	Criminal Justice Degree Programs
Florida Atlantic University http://www.fau.edu/academic/gradstud/MAJPM.htm	MJPM
Florida Gulf Coast University http://cps.fgcu.edu/pa/program.html	MPA/Administration of Justice
Florida International University http://chua2.fiu.edu/cj/MSPProgram.htm	MSCJ
Florida Metropolitan University Brandon http://www.fmu.edu/programs.asp?schoolProgram=Master%20of%20Science	MSCJ
Florida Metropolitan University Jacksonville http://www.fmu.edu/programs.asp?schoolProgram=Master%20of%20Science	MSCJ
Florida Metropolitan University Lakeland http://www.fmu.edu/programs.asp?schoolProgram=Master%20of%20Science	MSCJ
Florida Metropolitan University Pompano Beach http://www.fmu.edu/programs.asp?schoolProgram=Master%20of%20Science	MSCJ
Florida State University http://www.criminology.fsu.edu/masters.htm	MACJ
Florida State University http://www.criminology.fsu.edu/masters.htm	MSCJ
Florida State University http://www.criminology.fsu.edu/masters.htm	MPA and Criminology
Franklin Pierce College http://www.fpc.edu/pages/gps/gradstudies/msitmle/index.htm	MS Info. Technology for Law Enf.
College or University	
George Mason University http://www.gmu.edu/depts/pia/adj/graduate/adj.shtml	MPA/Administration of Justice
George Washington University http://columbian.gwu.edu/grad/programs.php/id/46	MACJ
Georgia College and State University http://www.gcsu.edu/acad_affairs/grad_school/criminaljustice.html	MSCJ
Georgia State University http://www.cjgsu.net/ms.asp	MSCJ
Grambling State University http://www.gram.edu/Colleges_Schools/Grad%20Studies/about.htm	MSCJ
Grand Valley State University http://www.gvsu.edu/cj/index.cfm?id	MSCJ

College or University	Criminal Justice Degree Programs
Grand Valley State University http://www.gvsu.edu/spna/mpa_cj.html	MPA/Criminal Justice
Illinois State University http://www.ilstu.edu/depts/cjs/graduate_program/	MS/MA CJ
Indiana State University http://web.indstate.edu/crim/newcrim/acadprograms/gp.html	MS/MA CJ
Indiana University Bloomington http://www.indiana.edu/~crimjust/Main/graduate.htm	MACJ
Indiana University Northwest http://www.indiana.edu/~bulletin/iun/grad/pea.html#cjcon	M Public Affairs
Indiana University of Pennsylvania http://www.hhs.iup.edu/cr/Masters.asp	MACJ
Indiana University of Pennsylvania http://www.hhs.iup.edu/cr/Masters.asp	MA Criminology
Iona College http://www.iona.edu/ionagrad/criminal.html	MSCJ
Jackson State University http://ccaix.jsums.edu/~jsuoaa/LiberalArts.htm	MA Criminology
Jacksonville State University http://www.jsu.edu/depart/criminal/criminal_justice.html	MSCJ
John Jay College of Criminal Justice, CUNY http://www.jjay.cuny.edu/programsGraduate/progGraduateDegrOffe.asp	MACJ
Johns Hopkins University http://education.jhu.edu/programs/psl_progdetail.cfm?MajorCode=721	MS Mgmt./Public Safety Leadership
Johns Hopkins University http://education.jhu.edu/programs/psl_progdetail.cfm?MajorCode=722	Accelerated MS Mgmt./PS Leadership
Kent State University http://dept.kent.edu/cjst/greq.htm	MA Justice Studies
Lamar University http://dept.lamar.edu/artssciences/crim/index.html	MS/MA CJ
Lewis University http://www.lewisu.edu/academics/masterscrim/index.htm	MSCJ
Lewis University http://www.lewisu.edu/academics/publicsafetyadmin/index.htm	MS Public Safety Administration

College or University	Criminal Justice Degree Programs
Lincoln University (Mo.)	MA in Sociology/Criminal Justice http://www.lincolnu.edu/%7Esbs/grad_degrees.htm
Lindenwood University	MSCJ Administration http://www.lindenwood.edu/academics/divisions/CrimJustGrad.html
Long Island University, Brentwood Campus	MSCJ http://www.liu.edu/cwis/brent/graduate/fasttrack_criminal.html
Long Island University, C. W. Post Campus	MSCJ http://www.cwpost.liunet.edu/cwis/cwp/colofman/programs/grad9.html
Longwood University	MS Sociology/Criminal Justice http://www.longwood.edu/graduatestudies/Catalog2004/SOCL.htm
Loyola University Chicago	MACJ http://www.luc.edu/schools/grad/programs/crmj.html
Loyola University New Orleans	MSCJ http://citycollege.loyno.edu/criminaljustice/mcj/
Lynn University	MSCJ Administration http://www.lynn.edu/index.php?submenu=Visitors_Masters&src=gendocs&link
Madonna University	MS Bus. Admin./Leader Studies in CJ. http://www.madonna.edu/pages/msbaleadershipstudiesincriminaljustice.cfm
Marshall University	MSCJ http://www.marshall.edu/criminal-justice/grad/GRAD-CON.HTML
Marywood University	MSCJ http://www.marywood.edu/departments/socsci/criminaljustice/mscj.html
Mercyhurst College	M Administration of Justice http://www.mercyhurst.edu/graduate/academic-programs/index.php?
Metropolitan State University	Master of Public & Nonprofit Admin.(LE) http://www.metrostate.edu/slc/progs.html
Michigan State University	MSCJ http://www.cj.msu.edu/~academic/MSabouttheprogram.htm
Middle Tennessee State University	MSCJ http://www.mtsu.edu/~graduate/programs/crju.htm
Midwestern State University	MPA/Criminal Justice http://hs2.mwsu.edu/healthandpublic/index.asp
Minot State University	MSCJ http://www.minotstateu.edu/artsnsci/grdegree.html

College or University	Criminal Justice Degree Programs
Mississippi College http://www.mc.edu/campus/academics/HIS/degrees.html	Master of Social Sciences/CJ
Mississippi Valley State University http://www.mvsu.edu/Academics/graduate/mscj.htm	MSCJ
Monmouth University http://monmouth.edu/academics/registrar/macj01.asp	MACJ
Morehead State University http://www.moreheadstate.edu/colleges/education/sociology/gradprogram	MA Sociology/Criminology
Mount Aloysius College http://www.mtaloy.edu/graduate-correct.htm	MACJ Mgmt. in Correctional Admin.
Mountain State University http://www.mountainstate.edu/majors/onlinecatalogs/graduate/programs	MSCJ Administration
National University http://www.nu.edu/Academics/Schools/SOBM/ProfessionalStudies/Degrees	Master of Forensic Sciences
New Jersey City University http://www.njcu.edu/graduate/academics/grad_criminal.asp	MSCJ
New Mexico State University http://gradschool.nmsu.edu/Catalog/dept/crimjust.htm	MSCJ
New York University http://www.law.nyu.edu/ils/program.html	JD/MA Law and Society/Criminology
Niagara University http://www.niagara.edu/crj/masters/	MSCJ
North Carolina Central University http://www.nccu.edu/academics/index.shtml	MSCJ
North Dakota State University http://www.ndsu.edu/ndsu/cjps/	MS Social Science/Criminal Justice
Northeastern University http://www.ulm.edu/criminaljustice/master.html	MCJ
Northern Arizona University http://www3.nau.edu/cgi-bin/om_isapi.dll?clientID=1380090433	MSCJ
Northern Michigan University http://www.nmu.edu/graduate_studies/graduate.html	MSCJ
Northwestern University http://www.northwestern.edu/graduate/academic/mppa.html	MA Police & Admin./Public Safety & Sec.
Norwich University http://www3.norwich.edu/mja/	MJA

College or University	Criminal Justice Degree Programs
Nova Southeastern University	MSCJ http://shss.nova.edu/Academic_Programs/ConcentrationPrograms/cji.htm
Oklahoma City University	MCJA http://www.okcu.edu/academics/
Oklahoma State University	MS Sociology/Corrections http://sociology.okstate.edu/grad/procedure.html#degrees
Pennsylvania State University, Harrisburg	MACJ http://www.hbg.psu.edu/hbg/programs/gradprog/crimj.html
Pennsylvania State University, University Park	MA Crime, Law, and Justice http://www.sociology.psu.edu/cljgrad.htm#program
Portland State University	MS Administration of Justice http://www.hatfieldschool.pdx.edu/courses/ajd.php#masters
Radford University	MA/MS CJ http://www.radford.edu/~crju-web/crjugrad.htm
Roger Williams University	MSCJ http://www.rwu.edu/Academics/Academic+Programs
Rutgers, The State University of New Jersey, Camden	MACJ http://sociology.camden.rutgers.edu/cj-masters.htm
Rutgers, The State University of New Jersey, Newark	MACJ http://www.rutgers-newark.rutgers.edu/rscj/Pages/BaBsMaProg.html
Salem State College/shepherd college	MS Geo-Information Science/CJ http://www.salemstate.edu/crj/CRJ-programs.php
Saint Ambrose University	MCJ http://web.sau.edu/criminaljustice/mcj.htm
Saint Cloud State University	MSCJ http://bulletin.stcloudstate.edu/gb/programs/cjs.asp
Saint John's University	MPS Criminal Justice Leadership http://new.stjohns.edu/academics/graduate/professionalstudies
Saint John's University	MA Criminology and Justice http://new.stjohns.edu/academics/graduate/pharmacy/gradprograms/masters.sju
Saint Joseph's University	MSCJ http://www.sju.edu/ACADEMIC_PROGRAMS/GRAD_ART_SCIENCE
Saint Leo University	MSCJ http://www.saintleo.edu/SaintLeo/Templates/Inner.aspx?pid=406

College or University	Criminal Justice Degree Programs
Saint Mary's University http://www.arts.smu.ca/sociology/MAcriminology.aspx	MA Criminology
Saint Mary's University of Minnesota http://www.smumn.edu/sitepages/pid1380.php	MA Public Safety Administration
Salve Regina University http://www.salve.edu/catalogs/graduate/jusadj_law.cfm	MS Mgmt/Law Enforcement Leadership
Sam Houston State University http://www.shsu.edu/cjcenter/College/graduate/masterofarts.htm	MACJ
Sam Houston State University http://www.shsu.edu/cjcenter/College/graduate/ms.htm	MSCJ
Sam Houston State University http://www.shsu.edu/cjcenter/College/graduate/masterofarts.htm	MA Criminology and CJ
Sam Houston State University http://www.shsu.edu/cjcenter/College/graduate/masterofscience.htm	MSCJ Management
San Diego State University http://www.sdsu.edu/academicprogs.html	MS Criminal Justice and Criminology
San Jose State University http://info.sjsu.edu/web-dbgen/catalog/departments/JS-section-5.html	MSCJ
Seton Hall University http://education.shu.edu/academicprograms/edadmin/index.html	MA New Jersey State Police Program
Shippensburg University of Pennsylvania http://www.ship.edu/academic/index.html	MS Administration of Justice
Southeast Missouri State University http://www.semo.edu/academics/gradschool.htm	MSCJ
Southern Illinois University Carbondale http://www.siu.edu/~ajsiuc/graduate.htm	MA Administration of Justice
Southern University at New Orleans http://www.suno.edu/academics/grad-course%20descriptions/grad_criminal.htm	MACJ
State University of New York at Albany http://www.albany.edu/grad/school_criminal_justice.html	MACJ & Soc. Work
State University of New York at Albany http://www.albany.edu/scj/prog-ma.html	MACJ
State University of New York at Buffalo http://www.law.buffalo.edu/Academic_Programs_And_Research/default.asp?	Master of Laws in Criminal Law
Suffolk University http://www.cas.suffolk.edu/sociology/cjms/home.html	MSCJ

College or University	Criminal Justice Degree Programs
Suffolk University	MPA/MS CJ http://www.thesawyerschool.com/pad_mpams_cj.htm
Sul Ross State University	MSCJ http://www.sulross.edu/pages/420.asp
Sul Ross State University	MS CJ/MPA http://www.sulross.edu/pages/438.asp
Tarleton State University	MCJ http://www.tarleton.edu/%7ECATALOG/2003-2004/20032004part5c.html#cj
Temple University	MACJ http://mdev.temple.edu/gradschool/common/p4.asp?progid=178&TID=241&sct=&lnk
Tennessee State University	MCJ http://www.tnstate.edu/interior.asp?
Texas A&M International University	MSCJ http://www.tamiu.edu/catalog/current/ms-crij-nonthesis.shtml
Texas Southern University	Master's in Administration of Justice http://www.tsu.edu/academics/graduate/degree/index.asp
Texas State University-San Marcos	MSCJ http://www.gradcollege.txstate.edu/03-05GCatalog
The Pennsylvania State University Harrisburg Campus of the Capital College	CRIMJ http://www.hbg.psu.edu/hbg/programs/gradprog/crimj.html
The Pennsylvania State University University Park Campus	MA Crime, Law, and Justice http://www.sociology.psu.edu/cljgrad.htm#program
Tiffin University	MCJ http://www.tiffin.edu/livepages/148.shtml
Tiffin University	MSCJ-FP http://www.tiffin.edu/livepages/1234.shtml
Tiffin University	MSCJ http://www.tiffin.edu/livepages/149.shtml
Towson University	MS Social Science http://www.collegesource.org/cat209/103993.pdf
Trinity College of Vermont	MS Administration of Justice http://programs.gradschools.com/graduate-schools/Trinity-College-Vermont.html
Troy State University	MSCJ http://www.troyst.edu/graduatestudies/2001bulletin/artsandsciences.pdf

College or University	Criminal Justice Degree Programs
University of Alabama at Birmingham	MSFS http://www.uab.edu/justice/html/master_s_program_in_forensic_sciences.html
University of Alabama at Birmingham	MSCJ http://main.uab.edu/show.asp?durki=24133
University of Alabama at Birmingham	MS Criminology and CJ http://main.uab.edu/show.asp?durki=10560
University of Alabama at Tuscaloosa	MSCJ http://bama.ua.edu/~bamacj/
University of Alaska Anchorage	MPA/Criminal Justice http://justice.uaa.alaska.edu/academic/mpacrimjust/
University of Alaska Fairbanks	MACJ http://www.uaf.edu/catalog/current/programs/justice_admin.html
University of Arkansas at Little Rock	MACJ http://www.ualr.edu/~cjdept/grad1.html
University of Baltimore	MSCJ http://www.ubalt.edu/study/graduate/criminal_justice.html
University of California, Irvine	MAS in Criminology, Law, and Society http://unex.uci.edu/distance/mas-cla/index.asp
University of Central Florida	MSCJ http://www.graduate.ucf.edu/acad_progs/index.cfm?
University of Central Oklahoma	MACJ Management and Administration http://www.libarts.ucok.edu/sociology/soc-cj-sas/graduate.htm
University of Cincinnati	MSCJ http://www.cech.uc.edu/programs/master_degree_programs
University of Colorado at Colorado Springs	MCJ http://carbon.cudenver.edu/public/gspa/programs/c06.html
University of Colorado at Denver	MCJ http://carbon.cudenver.edu/public/gspa/programs/c06.html
University of Delaware	MA Criminology http://www.udel.edu/soc/gradpage.htm
University of Detroit Mercy	MACJ http://liberalarts.udmercy.edu/soc_crim/crimjust_grad.html
University of Great Falls	MACJ Administration http://www.ugf.edu/academics/gradPrograms.htm

College or University	Criminal Justice Degree Programs
University of Houston Clear Lake	MACJ http://prtl.uhcl.edu/portal/page?_pageid=352,240704&_dadP
University of Houston-Downtown	MSCJ http://www.dt.uh.edu/academic/colleges/humanities/cj/graduate.htm
University of Illinois at Chicago	MACJ http://www.uic.edu/depts/grad/programs/crj.shtml
University of Illinois at Springfield	MPA/Criminal Justice http://www.uis.edu/publicadministration/criminal_justice_concentration.htm
University of Long Island, C. W. Post Campus	MSCJ http://www.cwpost.liunet.edu/cwis/cwp/colofman/programs/grad9.html
University of Long Island, C. W. Post Campus	BA/MS CJ http://www.cwpost.liunet.edu/cwis/cwp/colofman/programs/ugrad6b.html
University of Louisiana at Monroe	MACJ http://www.ulm.edu/criminaljustice/master.html
University of Louisville	MS Administration of Justice http://graduate.louisville.edu/catalog_2003/program_descriptions/ja.shtml#MSJA
University of Maryland Eastern Shore	MCCJ http://www.umes.edu/criminal/aboutgrad.html
University of Maryland, College Park	MA Criminology and Criminal Justice http://www.gradschool.umd.edu/catalog/programs/CRIM.html
University of Massachusetts, Lowell	MACJ http://www.uml.edu/Dept/criminal/undergrad/programs.htm
University of Memphis	MACJ http://academics.memphis.edu/gradcatalog0305/catcjus.html
University of Michigan Flint	MPA/Criminal Justice http://www.umflint.edu/mpa/criminal/
University of Minnesota, Duluth	MA Criminology http://www.d.umn.edu/socanth/CrimMA/
University of Missouri-Kansas City	MSCJ & Criminology http://iml.umkc.edu/soc/mscjcprog.htm
University of Missouri-St. Louis	MA Criminology and CJ http://www.umsl.edu/%7Eeccj/masters.html
University of Nebraska at Omaha	MA/MS CJ http://cid.unomaha.edu/~crimjust/msma.htm

College or University	Criminal Justice Degree Programs
University of Nebraska Omaha	MACJ http://www.unomaha.edu/~crimjust/ma.htm
University of Nebraska Omaha	MSCJ http://www.unomaha.edu/~crimjust/ms.htm
University of Nevada, Las Vegas	MACJ http://graduatecollege.unlv.edu/degree_programs/criminal_just.htm
University of New Haven	MSCJ http://www.newhaven.edu/psps/gradcriminaljustice.html
University of North Alabama	MSCJ http://www2.una.edu/soccrimjust/
University of North Carolina at Charlotte	MSCJ http://www.uncc.edu/criminal_justice/graduate.htm
University of North Florida	MSCJ http://www.unf.edu/graduatestudies/programs/coas/mscj.html
University of North Texas	MSCJ http://www.unt.edu/cjus/Graduate/graduate.htm
University of South Carolina at Columbia	MA Criminology and CJ http://www.sc.edu/bulletin/grad/GCrimJus.html
University of South Dakota	MPA/CJ http://usd.edu/polsci/graduate.cfm
University of South Florida	MA Criminology http://catalog.grad.usf.edu/currentpdf/GraduateCatalog_2004_05
University of Southern Mississippi	MA/MS CJ https://www.usm.edu/gradapp/html/masters.html
University of Tennessee	MA Criminology http://web.utk.edu/~utsocdep/other/criminal_justice.html
University of Tennessee Chattanooga	MSCJ http://www.utc.edu/Administration/GraduateSchool/cjust.html
University of Texas at Arlington	MA Crinology and CJ http://www.uta.edu/criminology/crcj04.htm
University of Texas at San Antonio	MS Justice Policy http://copp.utsa.edu/COPPfiles/advising/grad_catJP_031704.htm
University of Texas at Tyler	MSCJ http://www.uttyler.edu/cas/macrimin.htm
University of Texas of the Permian Basin	MSCJA http://www.utpb.edu/utpb_student/grad_cataloge

College or University	Criminal Justice Degree Programs
University of Texas-Pan American http://panam4.panam.edu/%7Ecsbs/cj/ms/index.html	MSCJ
University of Toledo http://www.hhs.utoledo.edu/criminaljustice/gradmaja.html	MACJ
University of West Florida http://uwf.edu/catalog/msa.pdf	MS Administration/Criminal Justice
University of Wisconsin-Milwaukee http://www.uwm.edu/Dept/Grad_Sch/Publications/Bulletin	MSCJ
University of Wisconsin-Platteville http://www.uwplatt.edu/disted/degrees/cj/index.html	MSCJ
Utica College http://www.economiccrimedegrees.com/exmasters.asp?src=&kwd	MS Economic Crime Management
Valdosta State University http://www.valdosta.edu/registrar/degrees.html	MSCJ
Villanova University http://www.gradcj.villanova.edu/	MSCJ
Virginia Commonwealth University http://www.has.vcu.edu/crj/New%20CRJ%20website/Mainpages	MSCJ
Washburn University http://www.washburn.edu/sas/cj/master/	MCJ
Washington State University-Spokane http://www.spokane.wsu.edu/academic/crim_j/criminal_justice_course.asp	MACJ
Wayne State University http://www.cla.wayne.edu/crimjust/nogrehdbk.htm	MSCJ
Weber State University http://documents.weber.edu/catalog/current/~cjms.htm	MSCJ
Webster University http://www.webster.edu/acadaffairs/acadprogs.html#ma	MBA Security Management
West Chester University of Pennsylvania http://www.wcupa.edu/_ADMISSIONS/SCH_DGR/prog_degree.html	MSCJ
West Texas A&M University http://www.wtamu.edu/administrative/vpa/adm/majors.htm#undergrad_fah	MACJ Studies
Western Connecticut State University http://www.wcsu.edu/graduate/degrees/moaja.asp	MS Justice Administration
Western Illinois University http://www.wiu.edu/grad/catalog/leja.shtml	MA Law Enforcement and Justice Admin.

College or University	Criminal Justice Degree Programs
Western New England College http://www1.wnec.edu/artsandsciences/index.cfm?selection=doc.964	MSCJ
Western Oregon University http://www.wou.edu/provost/graduate/msedcj.htm	MS Correctional Administration
Westfield State College http://www.wsc.ma.edu/cj/index_files/Graduate.htm	MSCJ
Wichita State University http://webs.wichita.edu/depttools/depttoolsmemberfiles/gradschool	MACJ
Widener University http://www.widener.edu/?pageId=2883	MACJ
Widener University http://www.widener.edu/?pageId=2884	PsyD/MA CJ
Wilmington College http://www.wilmcoll.edu/behavioralscience/msaj.html	MS Administration of Justice
Wright State University http://www.wright.edu/cgibin/catalog/grad.cgi?id=10	MA CJ and Social Problems
Xavier University http://www.xu.edu/MS_CJ/	MSCJ
Youngstown State University http://behhs.yzu.edu/dcj/dcj500.html	MSCJ

Appendix B

Panel Members Reviewing Draft Survey Instrument

**Draft Online Questionnaire
List of Panel Review Members**

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Johnson City, TN 37614-0555

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Mr. John Williams
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Columbia, SC 29212

E-Mail Request for Review of the Online Questionnaire Draft
June 30, 2004

Karen, Larry, Jamie, John and George,

Thanks for being my 2nd set of eyes! This questionnaire is step one of my data collection efforts. The survey will be posted on my website. Potential respondents are all the 117 graduates of the National Forensic Academy, and approximately 40 faculty, facilitators, researchers and scientists also involved with the Academy (so you will probably be seeing this again in the final form!)

I'm trying to identify the skills today's crime scene investigators feel are most important, then I am asking them to select courses they believe should be included in a Master's Level "Forensic Criminologist" program. The courses they select will then reappear in random order and they will be asked to rank them based on importance to developing the skills they previously identified.

The program will be a cross-disciplinary approach that combines Forensic Science courses with Criminal Justice courses to develop a well-rounded practitioner (crime scene investigator who understands and can explain the scientific basis for why he/she did what he/she did at a crime scene).

After 12 days the survey will close and I will develop interview questions from the survey responses. The Academy is having the first annual "re-trainer" reunion in August in Knoxville, and I will be scheduling interviews with some of the graduates and facilitators during this 3-day event.

When I have finished analyzing the information from the interviews, I am proposing to develop a model curriculum (Master's level) that will include the most appropriate multi-disciplinary courses utilizing the constructivist approach to learning (i.e. hands-on problem solving, etc) much like the current Academy is designed.

So, please look over the questionnaire. I need to know the following:

Does the instrument accurately reflect the knowledge, skills, and abilities required of practitioners in the field of crime scene investigation?

Are the two categories of course topics inclusive and comprehensive?

Will the design of this instrument allow the collection of data necessary to address the four dissertation research questions?

And finally, now I know that an honorary degree is definitely the way to go!!!

THANKS SO MUCH!!!

Jackie

Appendix C
Online Questionnaire

Online Questionnaire

This research study focuses on the educational needs of Crime Scene professionals. As the latest class of NFA students you have been selected to pilot test this questionnaire to measure its effectiveness and relevance. Your opinions are vitally important and will contribute to the final design of the research study. Thank you for taking time to provide your input!

The goals of this questionnaire are:

- 1. To gather demographic information about the survey participants*
- 2. To identify the skills that crime scene investigators and scholars perceive are essential to the successful practitioner.*
- 3. To determine the skill level a graduate student in the Forensic Criminalistics program should attain.*
- 4. To identify courses/topics that the practitioners and scholars believe must be included in a Master's level Forensic Criminalistics program.*
- 5. To establish the priority of the courses/topics in a model curriculum according to the survey participants.*
- 6. To gather additional information, suggestions, and other input from the survey participants that may be relevant to this research project.*

Part I. Participant demographics

1. Please indicate your years of professional experience in Crime Scene Investigation _____

2. What is your affiliation with the National Forensic Academy? (check one):
Student _____ Faculty _____ Scientist/Researcher _____

3. Are you a sworn law enforcement officer? Yes _____ No _____
If yes, please indicate your rank:
Officer ___ Sergeant ___ Lieutenant ___ Captain or above ___

4. What is your educational background?

Some college _____ Associate _____ Bachelor _____ Masters _____

Major _____

College or University _____

II. Skills Identification

Below is a list of skills identified in a variety of job descriptions for crime scene technicians/investigators. Based on your professional experience, please place an **X** in the column that indicates the relevancy to your job. If there are other skills you want to include, please enter them in the spaces provided. *For reference purposes, a short description of each job skill is provided following the chart.*

Skill	Essential	Important	Good to Know	Not Essential
Analysis Skills				
Communication Skills				
Computer Literacy				
Court Testimony				
Critical Thinking				
Delegation of Duties				
Document Examination				
Evidence Collection				
Fingerprint Classification				
Laboratory Analysis				
Latent Print Processing				
Organization				
Photography				
Report Writing				
Scene Interpretation				
Serial Number Restoration				
Sketching				
<i>Other:</i>				
<i>Other:</i>				
<i>Other:</i>				
<i>Other:</i>				
<i>Other:</i>				
<i>Other:</i>				

Analysis Skills—upon arrival at a crime scene, be able to assess and determine steps to be taken for processing the scene and provide an unbiased assessment of the evidence that can be identified and removed for further investigation. Also includes the capacity to determine what processes to request for evidence analysis.

Communication Skills—oral and written descriptions of the crime scene, actions taken, and explanations of those actions

Computer Literacy—the capacity to utilize available technology to compile reports, account for evidence, develop crime scene drawings, etc.

Court Testimony—ability to provide an accurate oral recitation of scene description and actions taken upon arrival and throughout the crime scene processing as well as evidence gathering and think “on your feet” in response to direct and cross-examination.

Critical Thinking—ability to assess the situation, determine additional resources needed and how to obtain them upon arrival at the scene; the capability of disposition.

Delegation of Duties—ability to identify primary responsibilities of investigator as well as tertiary duties that can be assigned to other personnel.

Document Examination—utilization of modern scientific equipment and proven methods to determine the authenticity of documents.

Evidence Collection—the proper identification, documentation, collection, and preservation of evidence according to established protocols. Must be able to think creatively when presented with challenging scenes or retrieval of potential items that have evidentiary value.

Fingerprint Classification—the examination of inked fingerprints that leads to the Henry and NCIC classifications accepted worldwide as the standard for categorizing human fingerprints.

Laboratory Analysis—not the performance of scientific analysis, but the knowledge and understanding of scientific processes that can be utilized on evidence to yield additional information that may be pertinent to the investigation. Familiarity with the protocols for scientific analysis can enhance the value of evidentiary items and may lead to the collection of items that previously would not have been perceived as important to the investigation.

Latent Print Processing—the use of chemical or other scientifically proven techniques that will make latent or hidden impressions visible for further examination and preservation through the use of photography.

Organization—competent to assess and process the scene in a logical, sequential manner that follows established protocols.

Photography—the use of 35mm, digital, and video equipment.

Report Writing—accurately capturing the events, actions and outcomes of the investigator responding to a crime scene.

Scene Interpretation—relates to analysis skills, but incorporates the investigator's ability to identify inner and outer crime scene perimeters, accurately determining ingress and egress routes of the offender; as well as identification of the types of crimes that potentially occurred at the scene.

Serial Number Restoration—the capacity to utilize chemical or other scientifically proven processes to enhance a hidden or partially disfigured serial number on an item of evidence.

Sketching—computer assisted or manually drawn depictions of the crime scene including measurements and all pertinent information.

Comments:

III. Rating the Skill Level of Graduate Courses

We are interested in your perception of the level of expertise a student in a Master's level Forensic Criminalistics program should attain **prior to graduation**. Please place an **X** in the column that most accurately reflects what skill level should be required in the coursework.

Skill	Essential	Important	Good to Know	Not Essential
Analysis Skills				
Communication Skills				
Computer Literacy				
Court Testimony				
Critical Thinking				
Delegation of Duties				
Document Examination				
Evidence Collection				
Fingerprint Classification				
Laboratory Analysis				
Latent Print Processing				
Organization				
Photography				
Report Writing				
Scene Interpretation				
Serial Number Restoration				
Sketching				
<i>Other:</i>				
<i>Other:</i>				
<i>Other:</i>				
<i>Other:</i>				
<i>Other:</i>				
<i>Other:</i>				

Comments:

IV. Course Topic Identification and Relevancy

Following are two lists of course topics. **Category A** includes Forensic Science and **Category B** includes Criminal Justice. Please place an **X** in the appropriate column to indicate how relevant the course topics are in developing the skills you need to become a proficient crime scene technician/investigator. There are spaces for you to list additional topics not found in either category. *A short reference list is also provided following the table that defines the major subject matter for each course topic.*

Category A – Forensic Science Course Topic	Essential	Important	Good To Know	Not Essential
Analytical Geometry				
Analytical Physics				
Archeology				
Biology-Cellular, Molecular				
Calculus				
Chemistry-Physical, Organic, Inorganic				
Forensic Comparative Science				
Forensic Entomology				
Forensic Medicine				
Forensic Pathology				
Forensic Psychology				
Forensic Serology				
General Biochemistry				
General Pharmacology				
Human Identification				
Human Osteology				
Instrument Analysis				
Intro to Forensic Microscopy				
Lab Measurements & Techniques				
Scientific Evidence				
Statistics				
Toxicology-General, Forensic				
Trace Evidence				
Zoo Archeology				
<i>Other:</i>				
<i>Other:</i>				
<i>Other:</i>				

CATEGORY A: FORENSIC SCIENCE

Analytical Geometry—limits, continuity, derivatives, differentials.

Analytical Physics—basic concepts of motion, waves, heat, electricity, magnetism and light.

Archeology—survey and excavation, archaeological mapping, photography and recording.

Biology-Cellular, Molecular—introduction to plant and animal biology including genetics, physiology, cell interactions, and basic genetic mechanisms.

Calculus—application of algebra and trigonometry; graphics, transformation, transformations and inverses of functions.

Chemistry-Physical, Organic, Inorganic—overview includes properties, structures, reactions, qualitative analysis.

Forensic Comparative Science—basic training in comparative methods used for the analysis of fingerprints, questioned documents and firearm evidence.

Forensic Entomology—taxonomic identification of forensic insects and proper identification of insects, methods of collection, and the importance to determination of time since death.

Forensic Medicine—anatomy and physiology of the human body with an emphasis on traumatic and unexpected deaths.

Forensic Pathology—terminology and scientific techniques used in medico-legal investigations of sudden or unexpected deaths.

Forensic Psychology—overview of the major psychological profiles, levels of motivation, and prognoses of the homicidal offender; criminal profiling.

Forensic Serology—analysis of suspected body fluid evidence.

General Biochemistry—establishes basics for all forensic science courses; also provides foundation for nucleic acids required for further DNA comprehension.

General Pharmacology—classification, synthesis and structure activity relationships of drugs and how they interact with the human body.

Human Identification—physical anthropological methods and techniques used to determine species and origin.

Human Osteology—provides a basic identification of the human skeleton.

Instrument Analysis—The use of scientific instrumentation for the analyses of physical evidence materials. Students will be able to choose the proper technique and understand the process used to successfully analyze an unknown material.

Intro to Forensic Microscopy—techniques of microscopy, photography, methods of processing and enhancement, methodology and the boundaries of trace analysis. Use of scanning electron, light, and polarizing microscopy.

Lab Measurements & Techniques—introductory overview of techniques to test evidentiary materials collected at crime scenes.

Scientific Evidence—learning the skills necessary to evaluate the applicability of each method of evidence analysis.

Statistics—understanding statistical studies, charts, tables and graphs.

Toxicology-General, Forensic—overview of the basic principles and practical aspects; defining the toxic agents most commonly; presents aspects from the perspective of the medical examiner as well as the laboratory scientist.

Trace Evidence—sample preparation, handling, analysis and data interpretation; use and conformity to standard protocols.

Zoo Archeology—identification of non-human skeletal remains.

Category B-Criminal Justice Course Topics	Essential	Important	Good To Know	Not Essential
Bloodstain Evidence				
Court Procedures				
Crime and Law				
Crime Scene Investigation				
Criminal Justice Foundations				
Criminalistics				
Criminal Procedure				
Cybercrime				
Death Investigation				
Document Examination				
Ethics & Professional Responsibility				
Evidence and Procedures				
Forensic Law: Scientific Evidence				
Forensic Photography				
Legal Aspects of Forensic Science				
Research Methods				
Victimology				
<i>Other:</i>				
<i>Other:</i>				
<i>Other:</i>				

CATEGORY B: CRIMINAL JUSTICE

Bloodstain Evidence—analysis of blood spatter evidence at a crime scene.

Court Procedures—examines kinds and degrees of evidence and procedure for admitting or excluding evidence, the hearsay rule and exceptions, burdens of proof and presumptions.

Crime and Law—rules and principles of exclusion, burden of proof, nature and effect of presumptions; proof of authenticity.

Crime Scene Investigation—proper protocol and evaluation of crime scene, evidence preservation, chain of custody.

Criminal Justice Foundations—analysis of evolving values and ideas regarding social control, responsibilities and rights.

Criminalistics—application of forensic science laboratory techniques to evidence analysis.

Criminal Procedure—bases of culpability, burdens of proof, evidentiary standards; preparation and presentation of evidence.

Cybercrime—focuses on obtaining forensically relevant information from suspect computers and other devices for analysis.

Death Investigation—focuses on death scene management, different types of trauma and causes of injury and death.

Document Examination—theory and principles of handwriting and handprinting, duplicating process, and methods of examination of documents.

Ethics & Professional Responsibilities—methods and ethical obligations of public service employees; examines codes of ethics.

Evidence & Procedures—rules of evidence for criminal trials and administrative proceedings.

Forensic Law: Scientific Evidence—the role that physical evidence plays in the criminal justice system; includes crime scene methods and laboratory management overview.

Forensic Photography—selection and use of equipment; photographs as evidence.

Legal Aspects of Forensic Science—analysis of the role of scientific and medical specialists in the analysis of criminal evidence, scientific criminal investigation, drug detection, violent and unnatural deaths.

Research Methods—a practical examination of the various research methodologies that may be used to complete master's thesis work.

Victimology—identifies the categories of people facing the greatest risks; and examines patterns and trends in victimization.

V. Your Comments and Suggestions

Please enter all additional information you feel is important as we consider developing the new program but is not covered in other areas of this survey.

- A. Skills not included on the list

- B. Courses/topics not included on the list

- C. Schools/programs of interest we should review

- D. What other questions should be asked pertaining to the development of a Master's level program in Forensic Criminalistics?

Appendix D

Agencies Represented By National Forensic Academy Graduates

**List of Agencies and Organizations represented by the
Graduates of the National Forensic Academy**

Department	City	State
Charleston PD	Charleston	SC
Knoxville PD	Knoxville	TN
Germantown PD	Germantown	TN
Pigeon Forge PD	Pigeon Forge	TN
Fargo PD	Fargo	ND
Memphis PD	Memphis	TN
Bradley Co. SD	Cleveland	TN
Chattanooga PD	Chattanooga	TN
Athens PD	Athens	TN
Hollywood PD	Hollywood	FL
Rankin Co. SO	Brandon	MS
Salisbury PD	Salisbury	NC
US Army CID	Rock Island	IL
East Ridge PD	East Ridge	TN
Columbus PD	Columbus	MS
Morristown PD	Morristown	TN
Dillon PD	Dillon	CO
Chapel Hill PD	Chapel Hill	NC
Cleveland PD	Cleveland	TN
Dalton PD	Dalton	GA
Univ. of TN PD	Knoxville	TN
Collierville PD	Collierville	TN
Martin PD	Martin	TN
Plano PD	Plano	TX
Cocke Co. SO	Newport	TN
Hamilton Co. SO	Chattanooga	TN
Gallatin PD	Gallatin	TN
Maryville PD	Maryville	TN
Fayetteville PD	Fayetteville	TN
Bristol PD	Bristol	TN
Lynchburg PD	Lynchburg	VA
Metro DC PD	Washington, DC	DC
Boone Co. SO	Burlington	KY
Gatlinburg PD	Gatlinburg	TN
Des Moines PD	Des Moines	IA
Baton Rouge PD	Baton Rouge	LA
Horn Lake PD	Horn Lake	MS

Department	City	State
Huber Heights PD	Huber Heights	OH
Houston PD	Houston	TX
Murfreesboro PD	Murfreesboro	TN
Terre Haute PD	Terre Haute	IN
Sevier Co. SO	Sevierville	TN
Modesto PD	Modesto	CA
Montgomery Co SO	Montgomery	AL
Hartselle PD	Hartselle	AL
Orange Co. SO	Hillsborough	NC
Washington Co. SO	Fayetteville	AR
Wilmington PD	Wilmington	NC
Army CID	Ft. Bragg	NC
Seattle PD	Seattle	WA
Redlands PD	Redlands	CA
Ft. Lauderdale PD	Ft. Lauderdale	FL
Dallas PD	Dallas	TX
Cambridge PD	Cambridge	MA
Gary PD	Gary	IN
Cape Girardeau PD	Cape Girardeau	MO
Philadelphia PD	Philadelphia	PE
Detroit PD	Detroit	MI
New York PD	Queens	NY
Georgia Bureau of Inves.	Decatur	GA
Henderson County SO	Hendersonville	NC
Austin PD	Austin	TX
Nassau Co. PD	Mineola	NY
Los Angeles PD	Los Angeles	CA
Chicago PD	Chicago	IL
Frederick PD	Frederick	MD
Columbus PD	Columbus	OH
Elkhart Co. SO	Goshen	IN
Broward Co. SO	Ft. Lauderdale	FL
El Paso PD	El Paso	TX
Marion Co. SO	Indianapolis	IN
Oklahoma SBI	Oklahoma City	OK
Texas Rangers	San Antonio	TX
Gary PD	Gary	IN
WV State Police	Kingwood	WV
Champaign PD	Champaign	IL
Duluth PD	Duluth	MN
Cleveland PD	Cleveland	OH

Department	City	State
Vanderbilt University	Nashville	TN
Medford PD	Medford	OR
Dept. Public Safety	Albuquerque	NM
Clayton Co. SO	Jonesboro	GA
Brevard Co. SO	Melbourne	FL

Appendix E

Initial E-Mail Notification of Online Questionnaire

August 12, 2004

Hello NFA Faculty Members!

As one of the facilitators for the National Forensic Academy you are no doubt aware there are limited opportunities to acquire advanced level training and education in crime scene investigation. I am currently researching this problem as I complete the requirements for a Doctorate of Education at The University of Tennessee. Dr. Bass is a member of the committee overseeing my study, and is supporting my efforts to develop this new program.

Many of you know I was a police officer for 17 years, working 10 of them as a crime scene investigator. I have worked on the NFA program since its inception and have a deep commitment to providing the best educational programs for the crime scene investigators.

You are helping us train the best crime scene investigators in the United States and your opinions will generate the design of a new Forensic Criminalistics Master's level model curriculum that I am developing as part of my dissertation research. I am asking you to complete an online survey that will take about 30 minutes of your time. The results of the survey will be used in the final determination of courses to be included in the new program. I would certainly appreciate your input and comments. Here is a link to my webpage and the online survey is accessed from there.

Thank you for your time!! I know that several of you will be joining us in Knoxville for the NFA Alumni Retraining Seminar. I will be conducting interviews with several of the attendees throughout the 3-days and if you are interested in participating in an interview, please send me an e-mail--your views are very important to my research!

<https://web.utk.edu/~jackiefi/>

Jackie Fish
Law Enforcement Innovation Center
The University of Tennessee
105 Student Services Bldg.
Knoxville, TN 37996-0213
Office: 865.215.1344
Cell: 865.389.7131
Fax: 865.215.1345
e-mail: jackiefish@utk.edu

August 12, 2004

Hello NFA Graduates!

As one of only 102 graduates of the National Forensic Academy you are no doubt aware there are limited opportunities to acquire advanced level training and education in your profession. I am currently researching this problem as I complete the requirements for a Doctorate of Education at The University of Tennessee. Dr. Bass is a member of the committee overseeing my study, and is supporting my efforts to develop this new program.

Many of you know I was a police officer for 17 years, working 10 of them as a crime scene investigator. I have worked on the NFA program since its inception and have a deep commitment to providing the best educational programs for you—the crime scene experts.

You represent the most highly trained crime scene investigators in the United States and your opinions will generate the design of a new Forensic Criminalistics Master's level model curriculum that I am developing as part of my dissertation research. I am asking you to complete an online survey that will take about 30 minutes of your time. The results of the survey will be used in the final determination of courses to be included in the new program. I would certainly appreciate your input and comments. Here is a link to my webpage and the online survey is accessed from there.

Thank you for your time!! I hope to see you in Knoxville for the NFA Alumni Retraining Seminar. I will be conducting interviews with several of you throughout the 3-days and if you are interested in participating in an interview, please send me an e-mail--your views are very important to my research!

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Appendix F

Second E-Mail Notification of Online Questionnaire

August 29, 2004

Tuesday, August 31st is the deadline for you to offer your input to the Forensic Criminalistics Survey that I am conducting for my dissertation research.

If you have already completed the questionnaire—THANK YOU!

For those of you keeping up, the faculty response rate is definitely lagging way behind the students!

Your opinions and experience are important and I hope you will be able to spend 30 minutes completing the online questionnaire at <http://web.utk.edu/~jackiefi/>

A high response rate will ensure the proposed Forensic Criminalistics program includes what crime scene technicians/investigators need to know.

Thanks again! I'll have some preliminary findings ready to share within a couple of weeks. If you are interested in hearing what your colleagues recommended, just e-mail me and I'll be glad to send you the summary.

P.S. GO VOLS! Only 7 days until it's FOOTBALL TIME IN TENNESSEE!

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Appendix G

Model Curriculum and Knowledge Elements

Forensic Investigation Graduate Program

Model Curriculum for Graduate Forensic Investigation Program

Required Core Courses (15 hours)

1. Evidentiary Protocols (3 hours)

Evidence & Procedures

- Physical evidence collection.
- Scientific data presentation.
- Converting physical clues into evidence that has investigative or probative value
- Proof of authenticity
- Examination of competency
- Contemporary court rulings including Daubert and Frye
- Documentation and report writing

2. Comprehensive Crime Scene Management (3 hours)

Crime Scene Investigation

- Proper protocol and evaluation of crime scene
- Biohazards and personal protective equipment
- Evidence preservation
- Chain of custody
- Foundations and techniques for proper crime scene investigation with or without a victim's body
- Logical approach for collecting evidence and documenting the scene and collection process
- Photography, crime scene sketching; field notes; report writing
- Collection and preservation of physical evidence
- Different types of crime scenes
- Detailed methods for investigation
- Introduction to forensic mapping and software packages
- Digital image processing and techniques to enhance analyze and catalog images

3. Law and Order (3 hours)

Court Procedure, Criminal Procedure, Crime and Law, Legal Aspects of Forensic Science

- Examines kinds and degrees of evidence and procedure for admitting or excluding evidence
- The hearsay rule and exceptions
- Burdens of proof and presumptions; judicial notice
- Bases of culpability, evidentiary standards; preparation and presentation of evidence

- Taught by lawyers and judges who understand and appreciate science and are practitioners in the criminal law field
- Deals with the definition and processing of substantive offenses along with the basis of criminal liability, defenses, and complicity
- Covers the scope of individual rights under due process, emphasizing arrest, interrogation, search and seizure.
- Rules and principles of exclusion, burden of proof, nature and effect of presumptions
- Analysis of the role of scientific and medical specialists in the analysis of criminal evidence
- Scientific criminal investigation
- Explore and practice testimony in mock trial settings with a judge, jury and video camera present.
- Emphasis on the applications of biological science to legal investigations involving human death; provides a definitive understanding of the role of the forensic science laboratory on the crime laboratory analyst in the legal system; links various life science disciplines
- Presumptive and confirmatory testing explained

4. Contemporary Criminal Justice (3 hours)

Criminal Justice Foundation

- Analysis of evolving values and ideas regarding social control, responsibilities and rights
- Crime statistics, causes of crime, relationship between drugs, crime, and violence; Criminological theories including biological, psychological, and sociological explanations for illegal activities
- Application of technology to police service and other interagency service providers
- Comprehensive overview of the criminal justice system
- Individual and collective responsibilities and rights
- Practitioners as public servants

5. Intra-Disciplinary Studies (3 hours)

Research Methods

- Practical examination of the various research methodologies that may be used to complete master's thesis work
- Research process and guidelines for formulating research questions and testable hypotheses
- Collection of data, designing experiments and carrying out surveys
- Data analysis strategies leading to a written report
- Identification of researchable topics and appropriate methodologies

- Plagiarism
- Presentation of verbal, tabular, and graphic data
- Application of the socio-scientific and scientific approaches to problem solving
- Effective presentation of verbal, tabular, and graphic data, desktop publishing and illustration research methods applied to solving problems; focus on the application of the socio-scientific and scientific approaches to problem solving
- End product is the development of thesis prospectus

OR

Ethics & Professional Responsibilities (3 hours)

Ethics

- Methods and ethical obligations of public service employees
- Examines codes of ethics
- Pays attention to the methods and ethical obligations of government employees assigned to gather evidence
- Encountering ethical conflicts and dilemmas
- Ethical legal and professional controversies
- Remaining objective; critical thinking; problem solving; clear communication

Course Electives (15 Hours)

(In-service students not completing an Internship must complete 18 hours of elective courses)

CSI: Death Investigation (3 hours)

Forensic Pathology, Forensic Medicine, Forensic Entomology

- Focuses on death scene management
- Different types of trauma and causes of injury and death
- Terminology and scientific techniques used in medico-legal investigations of sudden or unexpected deaths
- Anatomy and physiology of the human body with an emphasis on traumatic and unexpected deaths
- Taxonomic identification of forensic insects and proper identification of insects, proper methods of sample collection, and the importance to determination of time since death Forensic taphonomy
- Post mortem interval, decomposition,
- Crime scene management; dealing with the media and next of kin
- Understanding of how decomposing remains alter the surrounding environment and how the environment will alter the remains
- Identify physical changes and recognize patterns and artifacts produced on the body by environmental factors
- Wound pattern interpretation

CSI: Forensic Law (3 hours)

Forensic Law: Scientific Evidence

- Role that physical evidence plays in the criminal justice system
- Nature and scope of the discipline
- Application of forensic science to crime
- Crime scene methods and laboratory management overview
- The law of criminal procedure and rules of evidence as applied to forensic science
- Issues of scientific vs. legal burdens of proof
- Legal terminology and trial procedure
- Process by which the judicial system is aided by scientific evidence
- Application of scientific methods and analysis of scientific data to support the law enforcement community
- Legal, ethical natural science and laboratory skills required for forensic work

CSI: The Burning Questions (3 hours)

Arson, Fire, and Explosions

- Fire behavior
- Recognizing and conducting origin and cause motives of the fire setter
- Post-blast interpretation
- Determining causal factors, criminal intent and crime concealment
- The effect of heat on various materials
- Accelerants and sources of ignition
- Melting points and flash points
- Fire scene photography

CSI: Body Fluids as Forensic Evidence (3 hours)

Bloodstain Evidence, Forensic Serology, Toxicology-General, Forensic

- Analysis of blood spatter evidence at a crime scene
- Use of the scientific calculator, algebraic equations and trigonometry essential to plotting bloodstain pattern analysis at crime scenes
- Perspective of the medical examiner and the laboratory scientist
- Overview of the basic principles and practical aspects of serology
- Analysis of suspected body fluid evidence
- DNA
- Fundamental understanding of CODIS
- Quality assurance techniques used to analyze DNA for identification purposes
- Defining the toxic agents most commonly found in scientific analysis
- Biochemical activity of poisons and drugs
- Basic principles of toxicology and practical aspects of forensic toxicology

CSI: The Capabilities of the Crime Laboratory (3 hours)

Criminalistics, Forensic Comparative Science, Scientific Evidence

- Application of forensic science laboratory techniques to evidence analysis
- Skills necessary to evaluate the applicability of each method of evidence analysis
- Basic training in comparative methods used for the analysis of fingerprints, questioned documents and firearm evidence.
- Introduction to the Comparison Microscope
- Fundamental techniques used on the analyses and evaluation of physical evidence
- Concepts and techniques in the analysis of both nonbiological and biological evidence such as firearms and toolmarks
- Current developments in research, instrumentation and laboratory technology that is utilized to detect, identify, analyze, and compare evidence

- Application of forensic science laboratory techniques to the analysis of fingerprints
- Use and conformity to standard protocols; quality assurance and quality control methods used in the laboratory
- Unknown chemicals, physical evidence and biological clues
- Role of scientific analysis of criminal evidence, scientific criminal investigation, drug detection

CSI: Recovery of Skeletal Remains (3 hours)

Human Identification, Human Osteology, Forensic Archeology, Forensic Anthropology

- Overview of physical anthropological methods and techniques used to determine species and origin
- Basic identification of the human skeleton
- Survey and excavation, archaeological mapping, photography and recording
- Analysis of the human skeleton in crime scenes;
- Study of human skeletal remains from forensic anthropology cases
- Taphonomic factors
- Skeletal trauma, occurring near or at the time of death, blunt force trauma, gunshot/ballistic trauma, sharp force trauma, burned bone trauma
- Physical anthropological methods and techniques; overview of methodology on which it is based
- Documentation, recovery, and interpretation of physical evidence at the outdoor crime scene
- Forensic archeological techniques utilized during the search for clandestine crime scenes
- Archeological recovery of surface scatter of bones, buried bodies, fatal fire scenes and mass fatality sites
- Proper excavation methodologies and biological physical evidence collection
- Importance of the presence of a forensic anthropologist at the site of human skeletal remains

CSI: Without a Trace (3 hours)

Trace Evidence, Lab Measurements & Techniques, Instrument Analysis

- Introductory overview of techniques to test evidentiary materials collected at crime scenes
- Increase the knowledge and understanding of the analytical approach and interpretation of quantitative data
- Descriptions of various instruments, theory of operation and the fundamental science on which they are based
- Sample preparation and handling
- Use and conformity to standard protocols

- Analysis of trace evidence utilizing scanning electron microscope
- Explanation of synthetic and natural fibers; human and animal hair; GSR, toolmarks and firearms examination
- Learn the skills necessary to evaluate the applicability of each method as it applies to particular case situations
- Hands on experiences in the forensic science laboratory

CSI: The Electronic Crime Scene (3 hours)

Cybercrime, Forensic Photography

- Focuses on obtaining forensically relevant information from suspect computers and other devices for analysis
- How computers are involved in crime and as a source of evidence
- Foundations and fundamentals of digital forensics
- Overview of the advanced procedures and techniques used by investigators working with digital evidence
- Uses specially designed investigative computers to obtain forensically relevant information from suspect computers and other devices such as PDAs and cell phones
- Selection and use of equipment; photographs as evidence

CSI: The Profilers (3 hours)

Victimology, Forensic Psychology

- Identifies the categories of people facing the greatest risk
- Examines patterns and trends in victimization
- The impact of crime on the victim
- Overview of the major psychological profiles, levels of motivation, and prognoses of the homicidal offender
- Building a profile from the crime scene
- Competency to stand trial
- Psychology of the courtroom
- Focuses on the major psychological theories of criminal and aggressive behavior-case examples for discussion of various theories
- Special topics, alcohol and crimes; sex crimes; juvenile delinquency; women and crimes; violence and aggression; psychological dynamics of child abuse, spouse abuse, incest and other family violence
- Psychological profile of homicidal offenders

CSI: General Investigation Skill Development (3 hours)

Document Examination, Fingerprint Classification, Serial Number Restoration, Bullet Trajectory

- Theory and principles of handwriting and handprinting
- Duplicating process
- Methods of examination of documents
- Automated Fingerprint Identification System (AFIS)
- Crime Scene Diagramming with Total Station
- Footwear/Tire Impressions

Other Curriculum Components

(Students must select one of the three components to complete their degree)

All students are required to successfully complete written and oral comprehensive examinations prior to graduation

Internship (6 hours)

A ten-week internship in a crime laboratory of other forensic crime related agency; that will provide the opportunity for the student to apply principles and techniques learned in the educational environment. At the conclusion of the semester, a paper demonstrating proficiency in the knowledge, skills, and abilities necessary to apply the course work knowledge to the workplace must be submitted to the internship supervisor. This written assignment must be reflective, and include an assessment of the experience and involvement with the organization and noting significant events and how they related to the coursework the student has completed.

This component allows student to relate theory to practice through observation and experience. Students may suggest an agency or organizational setting. This is a requirement for pre-service students, and an option for in –service students. Internships completed by in-service students must be completed at an agency with a different organizational focus than the student’s current employer.

Graduate Research Project (6 hours)

This component must be designed by the student and receive approval from the graduate advisor. Completion of the project must demonstrate knowledge and proficient use of quantitative or qualitative methodology, research, critical analysis and problem solving. It requires the student to produce original research of either an applied or theoretical nature. A written document must demonstrate proficiency in the focus area and may form the basis for the thesis or future publication. The topic must be relevant to crime scene investigation and the student must be conversant with the principles underlying the research project.

Thesis (6 hours)

This component is required for those students who plan to seek an advanced degree. It is available to other program participants. Upon completion of the original research and the thesis, the student must prepare and present an oral defense. The graduate advisor must approve the research proposal before commencement of the study.

Additional coursework (9 hours)

This option is available for in-service students who are not interested in completing an internship, graduate research project or thesis. It is designed to provide additional classroom and laboratory training for the practitioner. This option requires completion of an additional elective course for a total of 18 elective hours. Acceptable grades for this option must be a B or higher in all courses.

Comprehensive Examinations

Prior to graduation, all students must satisfactorily complete a comprehensive written examination that addresses each of the areas of study. An oral examination is also required and will be based on any areas of the written examination where there is a perceived weakness or lack of clarity.

Vita

Jacqueline Trinkle Fish is a true East Tennessean. Born and raised in Bristol, she earned her undergraduate degrees at East Tennessee State University before accepting employment and relocating to Knoxville. She completed her Master of Science degree in Criminal Justice at The University of Tennessee, Chattanooga.

Most baby boomers have at least two professional careers and Jackie is no different. She began working in law enforcement in 1978 at the Knoxville Police Department and later moved to the Knox County Sheriff's Department where she worked as a crime scene investigator, and earned the rank of Lieutenant before leaving the agency after 16 years of service.

Now Jackie works at The University of Tennessee, Knoxville as the Curriculum and Grants Specialist for the Law Enforcement Innovation Center. She is the primary instructional designer for all the training programs offered by the LEIC and stays current on innovative technology that can improve the delivery of law enforcement services. She also manages Project Safe Neighborhoods, a gun violence reduction effort, for the United States Attorney's Office-Eastern District of Tennessee.

Jackie lives in Powell with her husband, Paul, who is a Captain with the Knoxville Police Department, so law enforcement is a primary focus both at home and the office. She has two children, Emily, who is a senior at Powell High School, and Jonathon, who is a junior at The University of Tennessee. The family enjoys traveling, both internationally and just camping at the beach. They are also active in Boy Scout activities and enjoy outdoor activities in the beautiful mountains of East Tennessee.