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Developing a Homeland Security Curriculum: A Case Study in Outcomes-Based Education Using the Delphi Method

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Developing a Homeland Security Curriculum: A Case Study in Outcomes-based Education Using the Delphi Method

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Abstract

The field of homeland security is a nascent discipline, and as such does not have a national accreditation body to promulgate a standardized, outcomes-based curriculum for future homeland security professionals seeking university degrees. This qualitative study was designed to identify a set of program-level, learning-based outcomes for an undergraduate degree in homeland security. The research project used a case study methodology to examine and validate the results of earlier studies on homeland security (HS) curriculum development. A consensus-driven, iterative Delphi technique was used to survey a purposive, convenience sample of homeland security experts to ascertain their ideas on what elements (i.e., knowledge, skills, and abilities) should comprise an undergraduate degree in HS, and then compare and contrast the data to earlier research projects. In addition, a 5-point Likert scale survey was distributed to gather basic demographics on the panel and to gage the respondents' thoughts regarding additional elements that should be included in an HS degree. The participants in the study identified a list of 15 core academic areas (CAAs) with a set of 50 associated program-specific objectives (PSOs), and a list of eight overarching program objectives (OPOs) that could comprise a standardized model homeland security curriculum. The proposed curriculum developed by this study enables an institution of higher learning to offer a unified, outcomes-based curriculum that would achieve a measurable level of knowledge, skills, and abilities a student must have to perform successfully as a homeland security professional in the 21st century. Additionally, adoption of such a model curriculum would be a precursor for an institution seeking program accreditation from a national accrediting body in the field of academic homeland security.

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Table of Contents

Page

List of Tables

List of Figures

Chapter 1: Introduction

Since the terrorist attacks of September 11, 2001, the concept of homeland security (HS) has enjoyed widespread interest by the military, the populace, academia, and by both state and federal government. The 2001 attacks led to a scrutiny of procedures and paradigms regarding homeland security which resulted in significant policy changes and reorganization at the highest levels of government (Polson, Persyn, & Cupp, 2010). While federal regulations and strategies underwent major change, educators concurrently examined their role in enhancing the knowledge and skills of homeland security professionals in order to effectively respond to the new terrorist threats. While the discipline of HS has a myriad of published guidelines and strategies, including 12 federal strategies, over 50 state and territory strategies, 13 homeland security presidential directives (HSPDs), and a growing list of implementation guides, there is currently no standardized, accredited degree program for homeland security students (Bellavita & Gordon, 2006). In a recent paper published in the *Journal of Homeland Security Education,* Ramirez and Rioux (2012) observed that a critical problem facing academic homeland security is the need for curricula and corresponding student learning outcomes to be developed that will be accepted by the U.S. Department of Education and a national accrediting body. Hence, the implicit need for this current study. What appeared from the outset of this academic self-examination were issues such as (a) the source of tomorrow's HS labor force, (b) the type of training and education this new HS workforce should have, and (c) the core areas of knowledge, skills, and abilities (KSAs) an academic degree in homeland security should encompass. Those topics were examined in this qualitative study and an outcomes-based curriculum was proposed and

vetted through a consensus-driven, on-line Delphi technique. Chapter 1 contains an examination of the background of the problem – specifically, a lack of standardized, accredited education in the homeland security field. In addition, this research project highlighted the scope of the problem and presented reasons why the study is of academic significance. A case study methodology was employed to examine and attempt to validate and expand upon an earlier study done by an Embry-Riddle Aeronautical University panel (Ramsay, Cutrer, & Raffel, 2010) which proposed initial elements of an undergraduate degree program in homeland security (note: hereafter, the Ramsay et al., (2010) study may also be referred to as the ERAU study). Using the Delphi technique, the researcher conducted an iterative survey of a large population (N=338) of homeland security practitioners (subject matter experts from the Center for Homeland Defense and Security's University and Agency Partnership Initiative, or UAPI) to ascertain their perceptions as to what knowledge, skills, and abilities should comprise an undergraduate degree in homeland security. The main product of the study was the identification of a model curriculum consisting of 15 core academic areas (CAAs), eight overarching program objectives (OPOs), and 50 program specific objectives (PSOs) to comprise a baccalaureate degree in HS. The results of this current survey were then compared with the data from other recent studies on developing HS curriculum to identify trends, overlaps, and variances.

Background

In the last decade, the Department of Homeland Security (DHS), originally comprised of 22 different agencies, has grown to become one of the largest Federal agencies ever created, employing 200,000 people (Jones, 2006). Security professionals

and other government employees essentially woke up on September 12, 2001, as newly minted homeland security professionals (Altizer, Bradshaw, Courtney, Hill, & Jilani, 2006). Experience and on-the-job training were prerequisites for these early HS practitioners, but there was a shortage of formal, advanced education in this nascent field. As early as 2003, the Department of Homeland Security (DHS) recognized the need for university level education to fill the gap that traditional training could not accommodate (Pelfry & Pelfry, 2009). The second Secretary of DHS has gone on record to state that as early as 2005 there was a vital need for increasing the level of education and expertise of those individuals entering the department (Chertoff, 2005).

To gain perspective on the size of the industry, Levinson (2002) reported that the private sector as a whole employed an estimated 1.8 million people in 2001, in one facet of security or another. According to Priest and Arkin, "some 1,271 government organizations and 1,931 private companies work on programs related to counterterrorism, homeland security, and intelligence in about 10,000 locations across the United States" (2010, p. 1). Even with a workforce of this size, protecting the nation from terrorist attacks and from natural disasters is a continuing challenge for the 21st century. The profession of homeland security has developed from a disparate set of reactive programs and policies into a more coherent interdisciplinary national strategy. However, when the U.S. Department of Homeland Security was established in 2003, the nation's first generation of homeland security professionals migrated from other related security and/or military fields. Eleven years after the terrorist attacks on the World Trade Center in New York, and nine years after the activation of the DHS, the field continues to congeal and morph into a diverse, dynamic profession. According to Winegar (2008), the current

homeland security workforce is aging, pushing ever closer to retirement, while the total number of job positions in the field of homeland security is growing. A research report from the Partnership for Public Service (2009) predicted that during the 2010-2012 timeframe, the Department of Homeland Security would need over 65,000 new hires to replace its aging workforce and build up its ranks to the necessary levels. However, Wormuth and Witkowsky (2008) opined that there is still no fully trained cadre of people with the broad-ranging skills and experience required to be truly effective in the homeland security arena today. This was a recurring theme detected all throughout the literature review and research conducted for this study.

The September 11, 2001, terrorist attacks (known collectively as *9/11*), where commercial airliners were hijacked and used as weapons, were the most destructive terrorist events ever to occur on American soil. The repercussions of this attack illustrated the nation's security vulnerabilities and emphasized the need for trained homeland security professionals. The former Secretary of DHS, Michael Chertoff, in a speech to Congress stated, "There is a growing need to invest in the department's most important asset, it's [*sic*] people, through top notch professional career training and development" (Chertoff, 2005, para. 1). A study in the *Journal of Homeland Security* contained the following quote, "America needs not only to train existing homeland security personnel, but also to educate the next generation of people charged with protecting the United States from terrorist threats" (Altizer et al., 2006, p. 1).

These observations underscore the need for a cohesive, standardized, and accredited education curriculum for homeland security professionals. Post 9/11, this sentiment reverberated through the halls of Congress as well as the halls of academe.

However, the subsequent outpouring of course offerings, concentrations, certificates, and degree programs for students wishing to obtain a degree in homeland security (HS) appears to have little guidance, direction, or input from the national level. Heyman and Carafano (2008) confirmed this suspicion in their report, finding that the current state of the academic homeland security discipline is still immature and that there is little standardization in core curriculum among academic institutions.

To fill the identified, growing need for trained, educated homeland security professionals after 9/11, academic institutions began to develop and proffer a variety of certificate and degree programs in homeland security and emergency management (Kiltz, 2009). A report published by the Homeland Security and Defense Education Consortium (HSDEC) states that, in the first 2 years after 9/11, over 40 American institutions of higher learning began offering Bachelor of Science (BS) degrees in homeland security (Rollins & Rowan, 2007). At a 2009 education summit in Washington, DC, the Director of Partnership Programs at the Naval Postgraduate School Center for Homeland Defense and Security reported that today, the number of U.S. institutions of higher learning offering some form of certification or degree in HS has grown to nearly 300 (Supinski, 2009). Suspinski (2012) later stated that the very fact there are hundreds of homeland security degree programs around the country further testifies to the field's widespread acceptance as an academic discipline. Today, the UAPI website lists 347 colleges and universities that offer an academic HS program (CHDS, n.d.). While these institutions of higher learning had the best of intentions when they promulgated these course offerings in the wake of 9/11, there was no standardization of programmatic oversight for these new homeland security courses.

As exciting and dynamic as growth in a new field is in theory, in practice the fact remains that currently there are no independent, national bodies in homeland security that certify bachelor's degree programs, such as the Accrediting Board of Engineering and Technology (ABET), which is the recognized organization for college and university programs in applied science, computing, engineering, and technology (ABET, 2008; Volkwein, Lattuca, Terenzini, Strauss, & Sukhbaatar, 2004). Additionally, a literature review accompanying this study yielded almost no published, peer reviewed, or generally accepted program level learning outcomes that define an undergraduate curriculum in the academic field of homeland security. Some recent studies have attempted to address this issue (Aviola, 2011; France, 2012; Ramirez & Rioux, 2012); however, there remains no clear consensus across the field of academia as to what elements a homeland security curricula should encompass. Hence, not only are there no independent, nationally accredited undergraduate programs in HS, neither are there peer reviewed and published program-level knowledge, skills or abilities (that is, program-level, learning outcomes) which comprise an accredited undergraduate curriculum. Indeed, according to Rollins and Rowan (2007), "A review of the available data does not indicate that the homeland security academic environment has matured to the point that common core courses are being taught at any level of higher education" (p. 3). Based on these observations, there is an expressed need to develop an academic curriculum that produces the next generation of properly educated homeland security professionals to fill this void. Therefore, that was the main thrust of this research effort.

In describing the field of academic homeland security, Rollins & Rowan, (2007) stated:

> Most homeland security practitioners and academicians agree that greater attention is needed to the role and utility of homeland security as a permanent and well-understood discipline. Many agree that in order for the field to mature the homeland security environment must be further defined which in turn would support the development of core educational objectives. (p. 3)

Therefore, the primary objective of this research project was to develop a curriculum including a set of program-level, learning-based outcomes aligned with existing accreditation standards used in higher education. The proposed methodology used to develop this new curriculum was twofold. In the first phase, a qualitative case study methodology was used to examine and validate an earlier study done by Embry-Riddle Aeronautical University (ERAU) in 2008. In the second phase, an on-line, self-reporting survey was used to identify additional elements that panelists feel need to be addressed regarding an undergraduate degree in HS.

Problem Statement

The problem addressed in this study is the lack of generally accepted or peer-reviewed program-level, learning-based outcomes that define a bachelor's degree in homeland security. Currently, there is no national accrediting body for HS degree programs, such as exists in other academic disciplines, despite the fact that the concept of homeland security continues to find its way into academia. According to Polson, Persyn, and Cupp (2010), "There is no nationally recognized program [for academic homeland security] in higher education at all" (p. 1). Many universities around the country have initiated degree programs in homeland security since 9/11, and that figure is over 300

today and growing (CHDS, n.d.; *HS Today*, 2009; Supinski, 2009). However, there appears to be little standardization among these academic HS programs.

An initial study was completed by Ramsay, Cutrer, and Raffel (2010) at Embry-Riddle Aeronautical University (ERAU) from 2007-2008, which surveyed a small panel of HS experts to help identify a list of the knowledge, skills, and abilities that HS majors should attain upon graduation. While that initial study was valuable, the size of the sample population used (N = 8) was statistically too small to produce conclusive results. Therefore, this qualitative research project was designed to validate and build upon that initial 2008 ERAU study by surveying a larger population of homeland security experts, made up of the 2010 membership of the University and Agency Partnership Initiative (UAPI) membership (N = 338). Additionally, other recent research projects relating to a facet of HS curriculum development were examined in order to present a unified, model HS curriculum, based on measurable learning objectives, which could be approved by a national accrediting body in HS education.

Purpose

In the last 11 years, the nation has taken many steps to increase its level of preparedness against terrorist attacks and other associated hazards to national security (Bullock et al., 2006). One of these steps includes the training and education of the next generation of homeland security professionals to meet the ever-changing threats of the 21st century. According to Gordon (2002), "a wide range of initiatives involving education and training are needed in order to help build the capacity of the Federal government to address current threats and challenges to homeland security" (para. 1). In addition, natural disasters such as Hurricane Katrina in 2005, further underscored the

need for trained professionals to manage response to such catastrophic events. The emerging discipline of HS will require the education and training of large numbers of professionals with the proper academic and practical background. These nascent homeland security practitioners must be provided the highest caliber of courses that our institutions of higher learning can offer.

Therefore, the purpose of this qualitative research was to identify a set of program-level, learning-based outcomes for an undergraduate degree in homeland security using a case study approach that builds upon the initial, Delphi technique employed by the earlier ERAU study and others. A case study methodology was used culminating in an iterative, consensus-driven survey distributed to a purposive convenience sample of membership of the University and Agency Partnership Initiative (UAPI), an organization chartered in 2006 to foster educational collaboration among institutions and agencies across the nation to support development of homeland security academic programs. Surveying this population, the researcher sought to determine what elements should comprise an undergraduate degree in HS. In addition, a 5-point Likert scale survey was deployed to gage the respondents' thoughts on other elements involving an HS degree, including the relative importance of specific curricula objectives in an Associate's, Bachelor's, or Master's degree program in HS. (The Delphi technique as a method of qualitative research will be explained in Chapter 2). As no in-depth study exactly like this has been accomplished in the field of academic homeland security, this research would benefit the entire field of higher education in meeting the documented challenge of providing the next generation of HS practitioners with the necessary knowledge, skills, and abilities based on the precepts of outcomes-based education.

Theoretical Framework

The framework for this study rests in qualitative research designed to identify the key elements that should constitute an academic degree in homeland security. While the discipline of HS has a plethora of published guidelines and strategies, including 12 federal strategies, over 50 state and territory strategies, 13 homeland security presidential directives (HSPDs), and a growing list of implementation guides with cryptic acronyms, there is no standardized, accredited degree program for homeland security students (Bellavita & Gordon, 2006). Unfortunately, in a nascent field such as homeland security, there is currently little agreement on what constitutes an appropriate HS curriculum. Degree programs being offered by colleges and universities today are a synthesis of existing programs of study in criminal justice, emergency management, political science, and international studies (Heyman & Carafano, 2008). In academe, the success of a program or discipline can be measured in many ways. According to Pelfrey & Pelfrey, (2009), traditional curriculum design is a structured, linear, and frequently lengthy process. That model cannot be followed when dealing with the rapid changes inherent in the emergent field of HS. Instead, HS curriculum should be developed, evaluated, and revised through a dynamic, iterative process. McCreight (2009) insisted that HS curriculum must contain material regarding necessary core areas, must adhere to accredited educational requirements, and must have standardized delivery mechanisms for degrees in homeland security. This research project posited that a curriculum derived from consensus of subject matter experts (SMEs) and based on assessment of measurable outcomes would be superior in imparting the required knowledge, skills, and abilities to graduates entering a dynamic, emergent field such as homeland security.

Research Questions

The basic research question guiding this study is – what competencies (knowledge, skills, and abilities) should undergraduates in homeland security possess? In turn, this overarching question leads to the following more in-depth research questions:

Q1: What core academic areas (CAAs), overarching program objectives (OPOs), and program-specific objectives (PSOs) should comprise an undergraduate degree in homeland security?

Q2: What areas of overlap exist between this study's final set of CAAs, OPOs, and PSOs and those developed by earlier studies, particularly the Ramsay, Cutrer, and Raffel (2010) study?

Q3: What additional elements are of importance to the academic field regarding the development of an HS degree program?

These research questions were by using a qualitative case study employing the Delphi technique to validate and build upon earlier studies, particularly by Ramsay, et al. (2010) that laid groundwork on what elements should constitute an undergraduate degree in homeland security. In its application, this research project showed that the initial results of these earlier studies, while small in scope and limited in nature were based on sound academic principles.

The current research study examined and built on the initial data collected by the ERAU research team and developed a comparative structure using a new, larger cohort of HS professionals (the UAPI membership), thereby validating the earlier study's process and results. An outcome of this study was a standardized, consensus-driven, externally vetted curriculum that can be used by any college or university wishing to offer an

undergraduate degree in HS. Again, these results will be shared with the UAPI membership and any academic or HS-related organization that is interested in the development of academic homeland security curricula.

Nature of the Study

The primary research question guiding this study was – what competencies (skills, knowledge, and abilities) should undergraduates in homeland security possess? To explore this question, the methodology of the study consisted of four phases, or rounds: (a) Round 1 - employment of the Delphi survey technique to a larger population of subject matter experts to determine by consensus what elements should make up the core academic areas (CAAs) in an HS curriculum; (b) Round 2 - promulgation of a survey instrument to poll the UAPI membership on what elements should be included in the overarching program objectives (OPOs) of an HS degree program; (c) Round 3 - distribution of a survey instrument to determine the program specific outcomes (PSOs) that should be associated with the core academic areas identified in an earlier round; and (d) Round 4 - obtain via survey the panel members' demographic data and elicit their responses on a variety of culminating questions regarding HS curriculum development. Prior to the fielding of the surveys, a literature review of the history of national defense and national security in the United States was conducted, along with review of material on curriculum accreditation, outcomes-based education, case study methodology, and use of the Delphi technique in consensus building research. Ultimately, the objective of this study was to poll a panel of HS experts to verify the validity and reliability of the results from the ERAU study (Ramsay et al., 2010) and other studies by comparing the data

gathered from surveying a larger population of diverse HS practitioners in this study – the 338 UAPI members.

Regarding research methodology, the Delphi method has proven to be a popular tool in research for identifying and prioritizing issues for high level decision-making (Linstone & Turoff, 2002; Okoli & Pawlowski, 2004). This research methodology can be useful to a researcher in helping to identify the variables of interest and generate propositions in the initial stages of development. An additional advantage can be realized through generalizability, allowing a researcher to extend observations and strengthen resulting theories across iterative levels of consensus. Asking experts on the Delphi panel to justify their responses is also a valuable aid to understanding the causal relationships between factors and can assist in building a cohesive theory. Delphi studies can contribute to construct validity, in that they make sure that the panel participants fully understand the meanings and terms contributing towards the common goal (Okoli & Pawolski, 2004).

In a similar study of an industrial engineering (IE) curriculum, a three-round Delphi technique was used to identify the emerging topics that should be built into the curriculum to prepare industrial engineering graduates adequately for the future workforce. Ultimately, survey responses from industry professionals and academic faculty were compared to determine differences, if any, in the curriculum requirements (Eskandari et al., 2007). The 2007 study above corresponds to the purpose of this research project, in that the results of a Delphi panel on homeland security core curriculum requirements will be used to validate those obtained in the 2008 ERAU study.

Content analysis built into the survey software assisted the researcher in maintaining an appropriate level of contextual sensitivity as well as forming a useful comparison between the outcomes developed by the Delphi panel from the ERAU study and others to the data obtained from this study. Given the fact that in the Delphi process, the researcher chooses the panel, there is a potential that outputs from the process will be biased by virtue of the panel selection. To counteract this potential for bias, the content analysis - comparing what this study generates via the Delphi method to data from the earlier study - will help to establish a measure of convergent validity of the study, which would help to validate the research methodology used, and the results obtained.

The project outcomes of this study included the development of a set of core academic areas (CAAs), with associated program specific outcomes (PSOs), and a list of overarching program objectives (OPOs) for an undergraduate degree in homeland security. Ultimately, it is the researcher's hope that the results of the study can be used by a national accrediting body for academic homeland security to use as they see fit in developing a standardized, national HS curriculum.

Given the nature of homeland security as an emergent academic discipline, there is no singular, formal assessment instrument. Rather, this project used a series of processes (Delphi method, qualitative surveys, and outcomes-based education models) to materially assess and modify core courses based on input from a panel of experts in the field of homeland security. Overall project success was achieved in four steps. First, a set of core academic areas for a baccalaureate degree was obtained from the participants; second, a set of overarching program objectives was developed by the panel; third, a list of program specific objectives was agreed upon by the participants; and fourth, data was

collected from the panel on a set of culminating questions regarding demographics and additional elements that make up an HS degree program. Finally, the data obtained by my study was compared to the initial results from the ERAU study and others in order to ascertain the degree of validity of the earlier research projects.

Data collection was in the form of an iterative, on-line survey administered to each of the selected Delphi panel members. A commercially available software program, *SurveyMonkey*®, was used to conduct the on-line survey, after the researcher's consultation with the ERAU Information Technology department, to ensure the program was reputable, user-friendly, and completely secure. Additionally, the researcher enlisted the review of departmental colleagues, at the doctoral level, with experience in designing surveys to help safeguard the concepts of reliability and validity of the study. For the purpose of this research project, a four-round Delphi process was employed to achieve the primary aims of the study.

Significance of the Study

Undoubtedly, the field of HS as a profession has matured during the past decade years since 9/11; however, it is still experiencing significant growth. As a nascent field of study, homeland security program curriculum has been forced to draw from a variety of established disciplines (Pelfrey & Pelfrey, 2009). The academic context of homeland security is diverse and broad, covering almost every security discipline and topic imaginable, including public health, military, history, intelligence, international relations, and emergency management. The Homeland Security Research Corporation (HSRC) is a multidisciplinary team of industry professionals representing expertise in the fields of homeland security engineering, intelligence, high-tech market analysis, airport security,

and technology research and development. Despite the downturn in the economy in the last few years, Kinzie and Horwitz (2005) asserted that homeland security is probably going to be the government's biggest employer in the next decade. According to the United States Department of Labor, by the year 2012, the job market is predicted to show a 28% increase in emergency management specialists, and that profession is on the list of the top 10 growth professions (Hot Majors, 2007). A Homeland Security Research Corporation article stated that the Department of Homeland Security and the Department of Defense need to fill an estimated 83,000 security-related and defense-related jobs in the next two years (HSRC, 2008). Additionally, as stated previously, a report published by the Partnership for Public Service (2009) indicates that over 65,000 new hires will be needed in the Department of Homeland Security between 2012 and 2012. Hence, the obvious question is raised: does the United States, specifically the country's institutions of higher learning, have the ability and capacity to answer this call with properly trained graduates?

The results of this study are a unique and valuable contribution to the education and academic homeland security literature because of the previously discussed need for a standardized approach to homeland security education. Additionally, research suggests that this would be the first in-depth, major study of its kind in the country to validate an outcomes-based homeland security curriculum incorporating a case study using Delphi methodology. A final goal of this research project was to propose a standardized HS curriculum that would aid an institution of higher learning in obtaining national accreditation for a homeland security degree program. As illustrated by the following quotation, the need for such a standardized, accreditable curriculum is well recognized:

"No national forum has been established to investigate and define what the future of homeland security education should be" (Newman, 2004, p. 15).

Providing its citizens with a safe and secure homeland is a key responsibility of any government. In order to be prepared to counter any terrorist threat or respond to any natural disaster, homeland security professionals and first responders must be properly trained and educated. Homeland security is a new core competence in the Federal government, and academic programs must be developed that will provide a cadre of educated leaders to meet the demands of the 21st century (Carafano, 2006). Aviola (2011) noted that there are no comprehensive guidelines for the creation of a homeland security curriculum, nor are there many scholarly, peer-reviewed publications on how to best evaluate the effectiveness of a homeland security academic program. Therefore, an outcomes-based, validated HS curriculum generated from this study will help set the academic accrediting standards for undergraduate homeland security degree programs throughout the country, thus creating a national capacity to deliver appropriately trained homeland security professionals for the future.

Definitions

Listed below are the key terms considered to be both critical and unique to an understanding of the research topic in this study.

ABET. The Accrediting Body for Engineering and Technology is an organization that is the internationally recognized U.S. accreditor of postsecondary degree-granting programs in engineering. ABET currently accredits nearly 2,000 engineering programs at more than 350 institutions (ABET, 2009).

Accreditation. From an academic viewpoint, accreditation means: the process of evaluating the academic qualifications or standards of an institution or program of study in accordance with pre-established criteria. "It is a method of external quality review created and used by higher education to scrutinize colleges and universities for quality assurance and quality improvement. Accreditation is performed by private, non-profit organizations designed for that specific purpose" (Eaton, 2006, p. 3).

Core Academic Areas of Homeland Security. These are major functional areas of homeland security that correspond to an extant academic discipline, are derived from the literature, and confirmed via consensus during the Delphi process (Derived from the ERAU study; Ramsay et al., 2010).

Delphi Technique. The Delphi method is an exercise in group communication among a panel of geographically dispersed experts. The technique allows experts to deal systematically with a complex problem or task. The essence of the technique is fairly straightforward. It comprises a series of questionnaires sent either by mail or via computerized systems, to a pre-selected group of experts whose charge it is to derive consensus (defined by the researchers) through a series of iterations using a preset, focused set of questions (Linstone & Turnoff, 2002).

Educational objectives. These are statements that describe the career and professional accomplishments that the program is preparing its students to achieve and are based on the needs of the constituents. Educational objectives are typically exemplified by graduates 5-10 years after graduation (Derived from the ERAU study; Ramsay et al., 2010).

Educational (program level) outcomes. These are what the program faculty intend students to be able to know, do, think (attitudinal) when the graduates have completed a given educational program (Derived from the ERAU study; Ramsay et al., 2010).

Homeland security. This term is defined as a concerted national effort to prevent terrorist attacks within the United States, reduce America's vulnerability to terrorism, and minimize the damage and recover from attacks that do occur (DHS, 2007).

HSDECA. The Homeland Security and Defense Education Consortium Association is a network of teaching and research institutions focused on promoting education, research, and cooperation related to and supporting the homeland security / defense mission. The association is committed to building and maintaining a community of higher education institutions supporting this mission and the overall homeland security effort through the sharing and advancement of knowledge (Center for Homeland Defense and Security, 2008).

Outcome-based education (OBE). OBE is an approach to education in which decisions about the curriculum are driven by the outcomes or standards (knowledge, skills, and abilities) the students should display by the end of the course. The emphasis is on the product, what sort of graduate will be produced, rather than on the educational process. In outcome-based education, the educational outcomes are clearly and unambiguously specified. These determine the curriculum content and its organization, the teaching methods and strategies, the courses offered, and the assessment process (Harden, Crosby, & Davis, 1999; "Outcome-based education", n.d.).

Overarching Program Objectives (OPOs): These are "general education" requirements - something that all HS students should be able to accomplish or demonstrate. OPOs refer to critical outcomes that do not necessarily or conveniently fall under an extant core academic area (CAA). They represent learning outcomes that can be accomplished by general education requirements of the university and hence do not necessarily need to be taught by the homeland security program (Derived from the 2008 ERAU study; Ramsay et al, 2010).

Program constituents. Those most interested in hiring or otherwise professionally using the skills, knowledge, and behaviors produced by the graduates of the HS program. Constituents are always consistent with both the institutional and program mission. Examples of program constituents include: employers, industry leaders, alumni, Government leaders, agencies, and individuals and organizations that the program identifies who absorb HS graduates (Derived from the 2008 ERAU study; Ramsay et al., 2010).

Program Specific Outcomes (PSOs): These are traits, skills, abilities, and behaviors desired by constituents; they must be able to measure the capabilities of the student and the program; they should be designed by the constituents and the academic program to cover major program components; they should be based on constituent/program consensus of needs and how to satisfy those needs; they must be able to be customized by each academic program as required; and they must be looped for periodic review and continuous quality improvement (Derived from the 2008 ERAU study; Ramsay et al, 2010).

University and Agency Partnership Initiative (UAPI). The University and Agency Partnership Initiative, a program under the auspices of the Center for Homeland Defense and Security (CHDS), brings together institutions nationwide dedicated to advancing homeland security education, seeking to increase the number and diversity of students receiving homeland security education, accelerate the establishment of high-quality academic programs, and provide opportunities for collaboration that create an intellectual multiplier effect that furthers the study of homeland security (CHDS, n.d.).

Summary

The task of protecting the homeland is a daunting challenge, it is one that will not diminish in the foreseeable future, and one that will require the best-educated cadre of men and women that academe can produce. According to Wagner, Longnecker, Landry, Lusk, and Saulnier (2008), two of the biggest challenges facing higher education are correctly and consistently identifying the knowledge, skills, and abilities (KSAs) needed to perform the job, and to adequately develop outcomes-based education so that graduates will be prepared with those KSAs to ensure success in the field. While progress has been made addressing these academic challenges, the field of homeland security education has not received the attention and standardization I feel it deserves. Ten years ago, McIntyre (2002) stated that "There is no nationally recognized program of higher education at all. In fact, there is no generally accepted curriculum for homeland security, because there is no generally accepted body of knowledge upon which to base an academic discipline" (p. 3). Polson et al. (2010) and Bradshaw (2011) report there is still a critical need and demand for quality educational programs today that provide professionals the fundamental knowledge and skills to meet future homeland security

challenges. These and other observations presented in Chapter 1 convinced me that there is a pressing need for standardization and accreditation oversight in the development of those KSAs and the subsequent curriculum for all degrees in the academic field of homeland security. It is important for academia to have a common baseline of HS knowledge, such as could be developed through an accreditation process. Winegar (2008) asserted that homeland security education develops the pool of future professionals, and there is an expectation that this cadre consistently should possess certain baseline knowledge, skills, and abilities of the discipline. This researcher concurs, and asserts that a common educational core curriculum could help produce this baseline. Building on the initial study done by Ramsay et al. in 2010 and others such as Bradshaw (2011) and France (2012), the researcher attempted to codify the program-level requirements for HS degree program curricula, framing the results in an outcomes-based methodology, and offering a proposed curricula that could ultimately be used as the basis for a standardized, nationally accredited HS degree program.

Chapter 2: Literature Review

The purpose of this qualitative research is to identify a set of core academic areas and program-level, learning-based outcomes for an undergraduate degree in homeland security using a case study approach that builds upon the initial, Delphi technique study done by a previous university study (Ramsay et al., 2010) among others. The literature reviewed for this research topic illustrated the need for an accredited homeland security curriculum, the concepts involved in developing an outcomes-based educational curriculum, and the potential of the Delphi technique to arrive at consensus on amorphous and undefined research topics. As there was not a wealth of published literature on the subject of developing the curriculum for a homeland security degree program, it was decided to approach the literature review for this study using a three-phase methodology. First, before a cogent discussion of the broad topic called homeland security can be conducted, it was necessary to examine the metamorphosis that homeland security as a discipline has taken since 9/11. Therefore, the literature review for this study included a brief history of homeland security and homeland defense in the United States and the policies and doctrines that guide the field today, which is critical to understanding what HS practitioners know and do in their field. Additional topics examined included outcomes-based education (OBE) and the Delphi technique as research methodology.

Once the historical context of homeland security was established, the researcher examined the concept of outcomes-based education (OBE), as a tool to ensure that the proposed HS curriculum being developed would impart an appropriate, measurable set of knowledge, skills, and abilities (KSAs) that should be imparted to the student. Finally,

the actual process used, a case study to vet the proposed curriculum employing an iterative Delphi technique using a panel of selected subject matter experts (SMEs), was analyzed for suitability as a qualitative research methodology.

Since 9/11, over a trillion dollars have been spent in a series of attempts to make life in America more secure from subsequent acts of terrorism and to some degree, secure from natural disasters, using an all-hazards approach. According to a Government Accountability Office (GAO) report, Congress authorized $808 billion to the Department of Defense between 2001 and 2009 to fight the Global War on Terrorism (GAO, 2009). During the same timeframe, the cumulative budget for the Department of Homeland Security (DHS) has totaled over $307 billion (DHS, 2009). Further, in a report published by *Global Homeland Security* (n.d.), entitled Homeland Defense and Intelligence Markets Outlook, it was estimated that the overall amount spent on national security in the U.S. would exceed 900 billion dollars by the year 2018. These figures obviously do not take into account the significant sums spent by the many other Federal, state, local, and tribal organizations that prosecute the homeland security mission. Despite the immensity of these sums, money alone will not win the war against terrorism. It will also take the combined efforts of a cohort of well-trained, highly educated, men and women to step into the positions of leadership in the emergent field of homeland security. A quote from an article in the *Journal for Homeland Security* underscores the point:

> The most destructive terrorist attack ever to occur on American soil illustrated the need for trained homeland security professionals. Other acts of terrorism in the past decade have emphasized this point. America needs not only to train existing homeland security personnel, but also to educate the next generation of people

charged with protecting the United States from terrorist threats. (Altizer, Bradsahw, Courtney, Hill, & Jilani, 2006, p. 1)

Soon after 9/11, scholars and legislators began to call for standardization in homeland security education. In a comprehensive report published by the Center for Strategic and International Studies, the authors noted that a fundamental element in developing the strategies and policies needed to protect the United States is the education of capable, well-trained homeland security professionals. The report went on to stress that "ensuring the quality and effectiveness of the homeland security workforce for the future should be a national priority" (Wormuth & Witkowsky, 2008, p. 75). Additionally, a 2006 report, entitled *The Federal Response to Hurricane Katrina*, listed as one of the lessons learned that the Department of Homeland Security should develop a comprehensive program for the professional development and education of the country's homeland security work force (White House, 2006b).

Obviously, a properly designed education is seen by the very highest levels of Federal government as one of the key requirements for the next generation of homeland security practitioners. Among the HS field itself, according to a recent survey of over 600 homeland security experts, 72 % of people polled felt that better trained and educated HS professionals would make the most dramatic improvement in the nation's overall homeland security posture (NHDF, 2009). The need for achieving a high level of effectiveness in homeland security through properly trained practitioners is critical; therefore, the caliber of education for homeland security professionals should be commensurately high as well.

It was stated earlier that the amount of scholarly literature on homeland security curriculum development available for review was limited, which is corroborated by Pelfrey and Pelfrey's (2009) observation that the educational literature on constructing a cohesive curriculum in this emerging field is sparse, with little or no guidance due to the nascent nature of the homeland security discipline. Other authors (Bradshaw, 2010, France, 2011; Kiltz, 2011; Ramsay et al., 2010, and Winegar, 2008) have examined the issue of homeland security curriculum development to some degree, but have only scratched the surface. Therefore, the literature review for this research topic focused primarily on the origin of homeland defense and homeland security, the need for a standardized homeland security curriculum, the concepts of developing an outcomes-based educational curriculum, an overview of accreditation in United States higher education, and the validity of using case study methodology and the Delphi technique to arrive at consensus on specific topics relating to a homeland security degree curriculum.

The literature review for this study indicated that the field of academic homeland security is in a state of flux. Homeland security is outpacing many other majors in colleges and universities in part because the government and corporations are eager to hire professionals schooled in disaster response (Portner, 2008). Bellavita and Gordon (2006) found that unlike medicine, law, engineering, and other professional disciplines, there is no general conceptual agreement about the range of topics that constitute homeland security as a field of academic study. Consequently, there is not a standardized approach to teaching homeland security. Gordon (2005) observed that there are many HS training programs in place that focus on various aspects of specific challenges and threats, but that many of these programs are geared to training only first responders and

emergency managers. While technical training is important, a review of current literature supports the notion that higher education in the concepts and strategies of homeland security is just as important. There is debate today among practitioners and subject matter experts as to the level of maturity of homeland security as an academic field of study. However, whether one defines homeland security as an academic discipline, a professional activity, a technical skill, or a national objective, it is this researcher's firm belief that the future of the field rests with proper training of the next generation of homeland security professionals.

Here is one example of homeland security curriculum development that will be used as a basis for this case study. With the field of academic homeland security in its nascent state, in 2005, the Daytona Beach, Florida campus of Embry-Riddle Aeronautical University (ERAU) decided to offer an undergraduate degree in homeland security. To implement this new degree program, the University hired two faculty members (one being the author of this study) during the spring of 2006 and the undergraduate degree program began in earnest in the fall of 2006. Since then, the HS program at ERAU has grown from two declared majors in September of 2006 to an (unofficial) tally today of over 250 declared majors and as many minors. In addition, four full time equivalent faculty members have been added to the staff to date (J. D. Ramsay, personal communication, April, 2012). This earlier ERAU study, explained in more detail below, served as the principal framework about which the current research project was built.

As stated earlier, there are no published, nationally accredited curriculum standards for undergraduate homeland security programs. Therefore, the initial HS degree program at ERAU was developed in 2006 based on a limited survey of what other

universities were offering in the way of homeland security courses, personal experience and background of the initial two faculty members hired, and a review of the textbooks on homeland security being used in the academic world at that time. When asked to define what academic homeland security was during an interview for this study, the Coordinator of the Homeland Security Program at Embry-Riddle Aeronautical University made this observation,

> At the undergraduate level, HS is a broad field of applied social science that leans on and uses the science from a wide variety of extant disciplines and which provides a functional and appropriate platform for entry level positions, or for a student to pursue subsequent credentialing, or go on to graduate work in related disciplines. (J. D. Ramsay, personal communication, May, 2011)

While the growth in the homeland security program at ERAU turned out to be spectacular, the HS faculty felt that there needed to be a mechanism to vet the undergraduate curriculum that it intended to construct/teach. A research study was therefore undertaken to gather expert opinion from practicing professionals in the industrial, military, and governmental/public sectors of homeland security in order to develop a set of program-level learning outcomes for the ERAU bachelor's degree in homeland security. To that end, an informal study was conducted at ERAU during 2007-2008. A small panel of subject matter experts (SMEs) representing well-accepted fields in homeland security and homeland defense were recruited as a survey population. The panel members were viewed as the SMEs who had the ability to identify core competencies needed by existing professionals in HS, and could thereby help establish the outcomes needed to form ERAU's homeland security curriculum.

An on-line Delphi process was conducted in iterational rounds beginning with developing consensus on what the broad educational objectives for every HS graduate should be. Then, in subsequent rounds, consensus was reached in what should constitute a broad set of program-level learning-based outcomes for a bachelor's degree in homeland security. Once these program outcomes were identified and consensus reached, the next iteration of the ERAU study identified core areas of study within the HS curriculum.

Following the development of a consensus set of educational and program level learning outcomes, and of core academic areas within those outcomes, the ERAU research team compared these outcomes to the current core courses in the homeland security curriculum syllabi. The purpose of this exercise was to ensure that each learning outcome identified by the Delphi panel is addressed and integrated into at least one core course, and that where needed, core courses are modified in such a way as to more completely integrate the learning outcome. From this study, the ERAU research team was able to generate three overarching educational objectives, eight general outcomes, and eight core academic areas that the Delphi panel felt was vital components of an HS degree curriculum (Ramsay et al., 2010). This process will be discussed in more detail in Chapter 3. That earlier work at ERAU conducted by Ramsay, Cutrer, and Raffel (2010) may be considered a landmark first step in the process of curriculum development of an HS undergraduate degree, and this researcher felt the subject deserved further research – hence this current study.

The Genesis of Homeland Security

Homeland security as we know it today was born on the morning of September 11, 2001, in the clear blue skies over New York City when hijacked commercial airliners were used as terrorist weapons to target the World Trade Center towers, and later the Pentagon in Washington, DC. That act, which has become known by its date, 9/11, is the seminal event that illustrated the United States was vulnerable to attacks on its home soil by small, determined bands of radical, non-military terrorists. The Preamble to the Constitution of the United States of America defines the federal government's basic purposes as "... to form a more perfect Union, establish justice, insure domestic Tranquility, provide for the common defense, promote the general Welfare, and secure the Blessings of Liberty to ourselves and our Posterity." (U.S. Constitution, 2010, para. 1) The requirement to provide for the common defense of the homeland remains as fundamental today as it was when these words were written, more than two hundred and thirty five years ago.

Tellingly, one of the first issues that became known as a result of the investigations into the September 11, 2001, terrorist attacks was that more than 40 different federal governmental agencies had homeland security responsibilities, and an estimated 2,000 separate Congressional appropriations were spread thinly over these myriad of agencies, with no central control point (Borja, 2008). A lack of coordination resulted in extensive redundancy of activities and clouded both critical intelligence and strategic planning (McCool, 2008).

Homeland security was, and is, a vital part of the nation's overall security strategy. In a speech to the U.S. Senate, then-Senator Barack Obama stated,

> We are here to do the work that ensures no other family members have to lose a loved one to a terrorist who turns a plane into a missile, a terrorist who straps a bomb around her waist and climbs aboard a bus, a terrorist who figures out how to set off a dirty bomb in one of our cities. This is why we are here: to make our country safer and make sure the nearly 3,000 who were taken from us did not die in vain; that their legacy will be a more secure Nation. (Obama, 2007, p. 1)

President Obama's highest priority is to protect the American people and strengthen our security here at home, and in that context, the President sees homeland security in the same light as national security (Obama, 2009). To carry out the President's vision and strategy for homeland security will require talented, well-educated men and women willing to work in the DHS, and a myriad of other federal, state, and local agencies to assist in the Global War on Terrorism. That is where academia factors into the equation – and the obvious question arises: Is our academic education program for homeland security professionals right for the times? According to a study conducted by the National Research Council, "at this point, the course offerings and programs in homeland security are still in their infancy" (NRC, 2006, p. 10). President George W. Bush affirmed the critical need for educating HS practitioners when he signed Executive Order (E.O.) 13434, which stated it was the policy of the United States to promote the education of future professionals in the homeland security and homeland defense field. This E.O. was intended to integrate professional development for the 21st century homeland security practitioner and achieve unity of effort through training and education (Bush, 2007). Thus, at the very highest levels of government, it was recognized that not merely training and experience were the hallmarks of an HS professional, but that a

formal, academic education in homeland security was also a key component in the combination of KSAs that were needed. Later research done by the National Research Council (NRC, 2006) and McCool (2008) underscored the fact that homeland security professionals need an academic, not just experiential, knowledge base to be able to develop the level of understanding necessary to implement strategic efforts to mitigate threats and respond and recover from their consequences. Hence, education is a core area for development of a robust cadre of HS professionals, and must provide students with a breadth and depth of knowledge, skills, and abilities to face the emergent threats of terrorism and hazards, both on the domestic and international front.

As stated previously, there exists an anticipated need throughout the country for competent, well-educated, homeland security professionals. Therefore, there has been both opportunity and pressure in higher education to quickly develop degree programs that will produce the next generation of homeland security practitioners (*HS Today*, 2009; HSRC, 2008). The result is over 300 programs to date that claim to offer some sort of homeland security education; that is, either an associate's degree, a bachelor's degree, master's degree or certificate (Rollins & Rowan, 2007; Supinski, 2009). Unfortunately, since HS is an emergent academic discipline and relatively new field, at this point there is no professional association that has an established and vetted set of program outcomes that are widely accepted, nor is there an organization that has itself been recognized or certified by either the U.S. Department of Education (DOE) or the Council for Higher Education Accreditation (CHEA) as an accrediting body for academic homeland security programs (CHEA, 2009).

In response to the terrorist attacks of September 11, 2001, the United States began a federal reorganization unlike anything that had been seen in this country since World War II. However, national security has been a vital element of the political, social, economic, and military structure of the United States long before the terrorist attacks of on the World Trade Center and the Pentagon. It should be noted that America has never been without some form of terrorism or political violence during its more than two centuries of existence; however, as the events of 9/11 brought home, the capabilities of those who wish to bring death and destruction has increased dramatically (Ward, Kiernan, & Mabrey, 2006). As such, there is a large body of literature outlining the history and development of the national defense and security strategies used to combat terrorism.

To be sure, the concept of defending the homeland has been around since 1776, but was always envisioned more in the form of the nation's armed forces defense against military invaders. During this country's colonial days, citizens looked to their local government for homeland defense, and militias were called out to fight against adversaries. After the War for Independence, the first priority for the fledgling American Congress was to establish and support a national force for homeland defense. As the United States grew and developed into a world power, its military became the primary means of carrying out homeland defense, which was really more a case of taking the war to the enemy. Between World War I and World War II, attention turned away from basic homeland security/defense because of overconfidence in our two ocean barriers and reluctance of isolationists to become engaged in foreign entanglements. National defense surged, of course during World War II, with the military taking the active role in

warfighting. Soon after the Second World War, (WWII), the nation began to think more about homeland defense/security as the Axis threat was crushed but Cold War loomed, generating an emphasis on Civil Defense. Finally, in the 1990s, with the collapse of the Soviet Union, civil defense priorities waned and homeland security became synonymous with homeland defense (Garamone, n.d.).

Leading the early efforts in homeland security, specifically recovery after natural disasters became the purview of the Federal Emergency Management Agency (FEMA). The Federal Emergency Management Agency coordinates the federal government's role in preparing for, preventing, mitigating the effects of, responding to, and recovering from all domestic disasters, whether natural or induced by humans. The end of the Cold War allowed the government to redirect more of FEMA's limited resources from civil defense into disaster relief, recovery, and mitigation programs (FEMA, 2008a). While FEMA's mission remains to lead America to prepare for, prevent, respond to, and recover from natural disasters, in 2001, there was no single Federal agency to coordinate the nation's homeland security strategy.

With the nation reeling from the attacks of 9/11, and a new agency, the Department of Homeland Security, being created to spearhead the fight against terrorism, what was needed was an overarching strategy to outline America's policy on homeland security. No strategy of this magnitude can be promulgated without a plan. As one of the first building blocks for the new national security strategy, in 2002, the Bush administration created political doctrines that anchor our government's policy on homeland security. In its precept, this landmark document, the *National Security Strategy for the United States of America*, reads:

> The U.S. national security strategy will be based on a distinctly American internationalism that reflects the union of our values and our national interests. The aim of this strategy is to help make the world not just safer but better. Our goals are clear: political and economic freedom, peaceful relations with other states, and respect for human dignity. (The White House, 2002, p. 1)

The *National Security Strategy for the United States of America*, born in the shadow of the post-Cold War doctrine of mutually assured destruction, posited a more globally cooperative, more proactive stance. It was the first post-9//1 policy doctrine that attempted to conform national policies to the realities of the modern situation where the threat to security is more likely to come from a terrorist group or a rogue nation, not the former Soviet Union (White House, 2002). In the span of 4 years, with international terrorism on the rise, this strategic document was revised and reissued in 2006, marking a return to the more multilateral approach of previous administrations. The newer edition restated America's commitment to supporting democracies and defeating terrorism, promulgated a plan to restructure institutions related to national security, and discussed the challenges of globalization, describing two key elements of national strategy: (a) promoting freedom, justice and human dignity, and (b) confronting the challenge of terrorism at the head of a community of international democracies (White House, 2006a). Finally, in 2010, the *National Security Strategy for the United States of America* was updated again and this latest revision specifically addressed the need to strengthen national capacity by, "adapting the education and training of national security professionals to equip them to meet modern challenges" (White House, 2010, p. 14).

This marks the first emergence of homeland security education into national strategy policies.

The second pillar in the country's security doctrine is the *National Strategy for Homeland Security* (NSHS). The first in a series of documents, published in 2002, had as its purpose the goal to mobilize and organize the nation to secure the homeland from terrorist attacks. From the very outset, this was acknowledged as an exceedingly complex mission that required coordinated and focused effort from every segment of society. The 2002 NSHS served as the first Federal document to lay out a plan to prevent terrorist attacks within the United States; to reduce America's vulnerability to terrorism; and to minimize the damage and recover from any attacks that did occur (DHS 2002). Six critical mission areas to which the nation's efforts should be focused and aligned were defined in this first HS strategy doctrine:

1. Intelligence and warning
2. Border and transportation security
3. Domestic counter-terrorism
4. Protecting critical infrastructure and key assets
5. Defending against catastrophic threats
6. Emergency preparedness and response (HSHS, 2002, p. vii)

Looking to the future, the 2002 NSHS identified four priority areas that would need additional resources and attention in subsequent fiscal years: (a) support of first responders, (b) defense against bio-terrorism, (c) securing America's borders, and (d) implementation of 21st century technology to secure the homeland (DHS, 2002).

Five years later, a second version of the *National Strategy for Homeland Security* built on the 2002 document added provisions to guide, organize, and unify America's homeland security efforts by focusing on the goals of: (a) preventing and disrupting terrorist attacks; (b) protecting the American people, critical infrastructure, and key resources; and (c) responding to and recovering from disasters that do occur, thereby ensuring the country's long-term success in the war on terrorism (DHS, 2007). This updated strategic plan demonstrated the government's increased understanding of the modern terrorist threat and incorporated lessons learned from such major disasters as Hurricane Katrina in 2005. In addition, the 2007 NSHS complemented the new policy guidelines published in 2006, the *National Strategy for Combating Terrorism*, building a firm foundation for a unified, comprehensive response to terrorism and forging a synergistic family of strategic plans (DHS, 2007).

A review of these national strategies clearly identifies that homeland security is, and must be, an inclusive, all-hazards discipline, involving not only the response to human aggressors (terrorists), but also to unpredictable acts of nature, such as hurricanes, floods, major fires, earthquakes, etc. Hence, Federal response to natural disasters is also a key part of homeland security. Historically, no comprehensive plan for federal emergency response existed until 1979, when President Carter signed an executive order creating the Federal Emergency Management Agency (FEMA), which was charged to coordinate emergency response duties between multiple agencies with a myriad of disjointed plans. In 1988 the Stafford Disaster Relief and Emergency Assistance Act became law, establishing a system of federal assistance to state and local governments.

Also, the Stafford Act authorized the Director of FEMA to prepare a Federal Response Plan (FRP) (FEMA, 2008a; FEMA 2008b).

In 2004, the *National Response Plan* (NRP) was published and it focused largely on the Federal roles and responsibilities in large-scale catastrophes. This document aligned key roles and responsibilities across the country and described specific authorities and best practices for managing incidents that ranged from the serious but purely local, to large-scale terrorist attacks or catastrophic natural disasters. The NRP brought together diverse organizations to assist state and local governments with disaster preparedness, thereby enhancing the ability to prepare for and to manage domestic incidents by establishing a comprehensive national approach (FEMA, 2008b). This was the nation's first attempt at a unified emergency response plan methodology, but it was aimed only at natural disasters, not acts of terrorism. The NRP was a good step in multi-national coordination of an all-hazards response, but many felt it did not recognize the part that public and private sectors can play in strengthening the Nation's response capabilities (FEMA, 2008b).

After the terrorist attacks of 9/11/01, a need to implement better incident management and develop a common planning framework for response was recognized. It was obvious that the original *National Response Plan* of 2004 needed to be updated. Therefore, in 2008, the *National Response Framework* (NRF) was published, superseding the NRP of 2004 and outlining the shared responsibilities of the Federal government, non-governmental organizations, the private sector, and individuals when it came to disaster response. The NRF of 2008 established a comprehensive, national, all-hazards approach to domestic incident response, by incorporating the tenets of the National

Incident Management System (NIMS) as the overarching template for managing incidents. The NRF described how communities, states, the Federal government, and the private-sector partners must apply NIMS principles for a coordinated, effective national response, allowing first responders, decision-makers, and supporting entities to act under a unified national strategy (FEMA, 2008b). Now, for the first time, the nation had a clear, unified policy on how each segment of the government (from Federal, state, tribal, and local) was to respond to disasters and catastrophes, both natural ones such as earthquakes and hurricanes, and man-made incidents such as major hazardous chemical spills or terrorist attacks with weapons of mass destruction.

In light of this structure of national strategies and policies, one element emerges as a vital, yet rarely mentioned component of homeland security, namely education. The world of academe, universities and colleges, have the responsibility to train and educate among others, future generations of homeland security professionals, making sure the graduates are thoroughly learned in the concepts and principles set forth in the national guidelines listed above. According to a study by the National Research Council (NRC), the appropriate role of colleges and universities in supporting homeland security is rooted in the traditional strengths of America's higher education sector, namely to provide relevant content knowledge, both specialized and general, to students; to educate citizens who are knowledgeable about the nature of threats and about core democratic values; and to provide a platform for public debate on critical issues of the day (NRC, 2006).

The terrorist attacks on the World Trade Center and the Pentagon on September 11, 2001 changed national perspective. A small band of terrorists, using commercial aircraft as guided missiles, was something different; the incidents were not natural

disasters we were prepared for such as earthquakes, floods, or hurricanes. These terrorist attacks struck at the heart of America and comparisons were immediately drawn with the Japanese sneak attack on Pearl Harbor in 1941. Moreover, the 9/11 attack showed that from a terrorist's viewpoint the United States was a vulnerable, even ripe target. To combat this new threat, President George W. Bush created a new Office of Homeland Security, the most significant transformation of the U.S. government in over a half-century, by largely transforming and realigning the current confusing patchwork of government activities into a single department whose primary mission was to protect our homeland (Bush, 2002). However, the military authority and responsibility of the Department of Defense was not altered by the establishment of the Department of Homeland Security under the Homeland Security Act of 2002 (McHale, 2006).

This then begs the question, what is the difference, both in terms of philosophy and terminology, between homeland security and homeland defense in the United States? The difference, according to McHale (2006), is "essentially a distinction between war-fighting and law enforcement" (p. 10). A closer examination of the definitions of those two terms is in order so that the duties and responsibilities of the Department of Homeland Security (DHS) and the Department of Defense (DOD) may be better understood. The official definition of homeland security as listed in the *National Strategy for Homeland Security* is, "a concerted national effort to prevent terrorist attacks within the United States, reduce America's vulnerability to terrorism, and minimize the damage and recover from attacks that do occur" (Purpura, 2007, p. 129). Homeland defense, on the other hand is defined by DOD (2005), as "the military protection of U.S. sovereignty, territory, domestic population, and critical defense infrastructure against

external threats and aggression, or other threats as directed by the President" (p. 5). Before the terrorist attacks of 9/11, the U. S. Armed Forces focused on deterrence, stability, and warfighting missions arising in overseas theaters of operation (Tomisek, 2002). To conduct these military operations, the President, as Commander in Chief, delegates the authority for war-fighting to the Secretary of Defense down through the military chain of command. By contrast, the president, through execution of his executive authority derived from Congressional action, assigns to various Federal agencies (primarily the DHS) the responsibility to defend the citizens of the U.S. against terrorist acts (McHale, 2006). In summary, the Secretary of the DHS exercises law enforcement responsibilities to protect the American people and the Secretary of the DOD conducts war-fighting operations to achieve the same result.

The need for close interoperability between U.S. forces that provide homeland defense and homeland security was re-emphasized by the events of 9/11. To help bridge that gap and provide strategic oversight, the DOD established the U.S. Northern Command (USNORTHCOM) in October of 2002 to provide command and control homeland defense efforts and to coordinate defense support of civil authorities (USNORTHCOM, n.d.). Per its mission statement,

> USNORTHCOM anticipates and conducts Homeland Defense and Civil Support operations within the assigned area of responsibility (AOR) to defend, protect, and secure the United States and its interests. This AOR includes air, land and sea approaches and encompasses the continental United States, Alaska, Canada, Mexico and the surrounding water out to approximately 500 nautical miles, including the Gulf of Mexico and the Straits of Florida. USNORTHCOM's civil

> support mission includes domestic disaster relief operations that occur during fires, hurricanes, floods, and earthquakes. Support also includes counter-drug operations and managing the consequences of a terrorist event employing a weapon of mass destruction. (USNORTHCOM, n.d., para. 1-4)

The formation of USNORTHCOM also saw the genesis of the Homeland Security/Defense Education Consortium, or HSDEC. In the summer of 2003, USNORTHCOM was faced with the prospect of hiring a workforce capable of handling its recently designated homeland defense and security (HS/HD) mission set. The command quickly realized that personnel with the required knowledge and skill sets were not available in either the military or civilian communities. Meeting the demand led to the establishment of HSDEC. Though initially intended to enhance academic program development and consequently provide more options to military command personnel, the organization summarily took on the broader role of promoting education, research, and cooperation to support the national HS/HD mission. Academic membership in the HSDEC grew very rapidly. In just four years, the number of affiliated organizations exceeded 250 universities, colleges, and other interested agencies (HSDEC, 2007). The role of the initial HSDEC in establishing a homeland security and defense academic community cannot be understated.

In an early attempt to identify the curriculum requirements for homeland security education programs, HSDEC convened a series of curriculum development workshops in 2007. These workshops consisted of small working groups of HSDEC members whose stated purpose was to facilitate and promote active and substantive work on HS curriculum issues. One product of these workshops was a draft report entitled *Core*

Curriculum Recommendations, which proposed ten agreed outcomes for HS education at the undergraduate level. The ten recommended curriculum outcomes from the 2007 HSDEC workshops are shown in Table 1.

Table 1

HSDEC Core Curriculum Recommendations

Undergraduate Outcomes	Description
UO1	Ability to identify, assess, and prioritize threats, risks, and vulnerabilities
UO2	Ability to identify and coordinate resources to combat threats, minimize risks, and reduce vulnerabilities
UO3	Ability to communicate within government, across government levels, and to all sectors.
UO4	Ability to assess community needs and resources in the context of critical situations.
UO5	Ability to understand principles of managing people, financial obligations, and projects.
UO6	Ability to understand and work with the environment of social, economic, legal, ethical, technological, and political interdependencies of homeland security
UO7	Understanding of public, private, and non-profit institutional roles and responsibilities of homeland security
UO8	Ability to work effectively within and understand dilemmas of collaborative networks
UO9	Ability to develop, interpret, and assess plans
UO10	Ability to collect and analyze data and information

Note: Adapted from "HSDEC Core Curriculum Recommendations" (2007). Retrieved from http://www.hsdec.org/research.aspx

Obviously, these curriculum recommendations are at a strategic level, and do not delve into the outcome-based, program-specific objectives that would be employed to measure each of the learning outcomes identified. (Note: This researcher's review of the literature on this topic reveals that most of the early studies conducted on homeland security curriculum development rarely reach the granularity of program-specific objectives that should accompany the core academic areas being taught at universities and colleges offering degrees in homeland security). While no unilateral action was taken by the academic world at large on the 2007 HSDEC recommendations, the report did serve to establish a baseline of learning outcomes that HS professionals felt were critical for homeland security students. Finally, the HSDEC report paved the way for subsequent studies on homeland security curriculum development such as Winegar (2008); Bradshaw (2011); France (2012); and ultimately this researcher's project as well.

In conjunction with the genesis of HSDEC, the Center for Homeland Defense and Security (CHDS) at the U.S. Navy's Postgraduate School also formed the University and Agency Partnership Initiative (UAPI), which facilitates educational collaboration among institutions and agencies across the nation to support development of homeland security academic programs. Recognizing the growing national demand for a pipeline of homeland security and defense professionals, the need to educate a broad spectrum of students, and its own limited capacity, CHDS began the initiative in early 2006. The UAPI, brings together institutions nationwide dedicated to advancing homeland security education. From the CHDS website, the mission statement of UAPI is:

> Seek to increase the number and diversity of students receiving homeland security education, accelerate the establishment of high-quality academic programs, and

> provide opportunities for collaboration that create an intellectual multiplier effect that furthers the study of homeland security. UAPI provides mutual support to partners launching homeland security programs, helps prevent redundancy in curriculum development, and encourages partners to improve and add to the curricula that already exist. (CHDS, n.d., para 1)

The number of institutions participating in UAPI grew rapidly along with the nationwide growth of programs in the homeland security discipline (S. Supinski, personal communication, April, 2010). Homeland security education was widely recognized as a growing area in academia, a fact clearly reflected in the UAPI membership, which grew to include 211 participating institutions (totaling 338 individual university and agency members) by of the spring of 2010. The UAPI partners are a diverse demographic mix, coming from 40 states and the District of Columbia, and include schools of every size, as well as various federal agencies responsible for homeland security/defense, making it the ideal survey population for this research project (CHDS, n.d.).

While the UAPI membership grew, the HSDEC leadership decided in 2008 that HSDEC no longer fit under the purview of DOD, and that it should morph into a member run organization similar to other discipline specific associations. HSDEC ceased to exist in November 2008, converting to HSDECA – with a full title of the Homeland Security/Defense Education Consortium Association (CHDE, n.d.). Now the lead organization in academic homeland security, HSDECA recognized that guidance and a coordinating body were needed, and it stepped in to fill this void until the HS community could organize effectively. Since 2008, HSDECA began to position the organization to become the nation's accrediting body for academic homeland security education.

However, that process appears to have stalled in the early formative stages, leaving a void in the accreditation field (J. Ramsay and S. Supinski, personal communication, April 15, 2010). This will be discussed further under the section on accreditation.

On a larger scale, as the single government entity formed to lead the nation's war against terrorism, the Department of Homeland Security (DHS), initially staffed by 24,000 employees in 2002, has grown from an agency, to a department, and finally a secretariat, which now employs over 200,000 individuals whose primary focus is the nation's security (OMB, 2004). The individuals that work in the DHS were seasoned professionals, recruited from every agency within local, state, and federal government, and were selected based upon their current levels of expertise in fields associated with security. As can be surmised, many of this initial cohort of homeland security professionals had prior careers in the military, intelligence, or law enforcement and are now reaching the end of their second career, meaning they will soon have to be replaced with younger, qualified, educated professionals who will guide the DHS through the 21st century.

It is noted that DHS has displayed a commitment to higher education since its inception. For example, the Homeland Security Act of 2002 granted the Department of Homeland Security the authority to create university-based Centers of Excellence, stating, "DHS shall designate a university-based center or several university-based centers for homeland security. The purpose of these centers shall be to establish a coordinated, university-based system to enhance the Nation's homeland security" (DHS, 2009b, p. 1). These DHS academic centers of excellence are chartered to bring together leading experts and researchers to conduct multidisciplinary research and education for

homeland security solutions. Each center is led by a university in collaboration with partners from other institutions, agencies, laboratories, think tanks, and the private sector – all engaged in specific homeland security research and development. To that end, DHS has awarded over $300 million in research grants since 9/11 to its centers of excellence, which is a significant deposit into academic HS education (Portner, 2008). In 2005 alone, $64 million went directly to university programs, including major research centers, scholarships, and fellowships (Kinzie & Horwitz, 2005).

Specifically, the Science and Technology Directorate within the DHS is charged to stimulate, coordinate, and utilize the unique intellectual capital in the academic community to address current and future homeland security challenges, and educate and inspire the next generation homeland security workforce to:

1. Foster a homeland security culture within the academic community through research and educational programs.
2. Strengthen U.S. scientific leadership in homeland security research;
3. Generate and disseminate knowledge and technical innovations to advance the homeland security mission.
4. Integrate homeland security activities across agencies engaged in relevant academic research.
5. Create and leverage intellectual capital and nurture a homeland security science and engineering workforce. (DHS, 2009, p. 1)

While this mission statement for DHS sets lofty but laudable educational goals, nowhere does it list what specific knowledge, skills, and abilities (KSAs) that HS graduates from these universities should possess to achieve success as the next generation

of homeland security practitioners. Nonetheless, DHS wants institutions of higher learning to educate the next generation of homeland security leaders who are able to demonstrate critical thinking, creativity, and translate policy into action (Bellivita & Gordon, 2006).

However, based on review of currently published literature, there appears no clear, cogent, and overarching standard at this time for the curriculum that should be taught to the next generation. Several professional sources (Alitzer et al., 2006; Chertoff, 2005; Obama, 2009; and Rollins & Rowan, 2007) agreed that homeland security education is a matter of national security and that there has been a general lack of standardization in the development of homeland security academic curriculum. The homeland security academic discipline is currently an evolving ungoverned environment of numerous programs purporting to prepare students for various positions of responsibility. Newman (2004) stated that effective homeland security readiness can only be achieved through well-focused educational programs. Courses in homeland security abound, yet there is no standardization. According to a study done by Rollins & Rowan (2007), "Many of today's homeland security offerings are an amalgam of pre-9/11 programs and courses that have since been revised to reflect some undetermined level of education and instruction in homeland security issues" (p. 3). For example, if a program had its roots in criminal justice, there would logically be more terrorism-related courses. Likewise, in a program with an emergency management emphasis, courses in emergency management, consequence management, and planning would be more prevalent.

More recently, in 2010, the Department of Homeland Security published its first Quadrennial Review Report (QHSR), entitled *A Strategic Framework for a Secure Homeland*, which reflects the most comprehensive assessment and analysis of homeland security to date. In the QHSR, the government acknowledges that "a well-documented need within the national security community is a professional development program that fosters a stable and diverse community of professionals with the proper balance of relevant skills, attributes, experiences, and comprehensive knowledge" (DHS, 2010, p. 71). The report lists three elements of professional development for HS personnel, namely education, training, and experience. However, the QHSR goes on to clearly acknowledge the role that higher education plays in forming and guiding the activities of participants in homeland security, serving to further emphasize enterprise-wide approaches to enhancing homeland security professional development (DHS, 2010).

While the total number of homeland security professionals may be large, anecdotal information indicates that the majority of homeland security professionals in the workplace today are older men and women on their second career, having come into the HS field from other professions such as law enforcement, emergency management, or the military (Winegar, 2008). Many vitally important positions designed to protect citizens, infrastructure, and key resources were filled by people based on their time and grade within existing organizations. While several government organizations have increased their hiring rates in response to the personnel need, this only serves to strengthen the need for a standardized, accredited academic curriculum in HS for the next wave of professionals in the field. In a field of endeavor whose missions and responsibilities require the routine delivery of extraordinary performance, the need for

development and investment in the future in the form of homeland security academic education is critical. Pelfry and Pelfry (2009) provide a cogent summation of this discussion by observing that a viable model of curricula that can be tested, refined, and implemented is required in order for the field of academic homeland security to become a formal discipline. Moore, Hatzadony, Cronin, and Breckenridge (2010), echo the basic sentiment of many HS academics regarding issues with curricula development when they stated,

> At present, there is no general consensus on how a homeland security or intelligence studies curriculum should be offered, although recommendations have been made by the Homeland Security Defense Education Consortium (HSDEC) regarding the curricula for undergraduate and graduate level programs. Nor has any accrediting body for such programs come into existence as of this writing. (p. 1)

Hence, the literature review conducted by this researcher has served to strengthen the idea that there is a real need for a standardized, accredited, and outcomes-based curriculum for a homeland security degree – one that includes program-specific objectives. The ongoing search for such a curriculum has been the subject of several recent studies (Bradshaw, 2011; France, 2012; Ramsay et al., 2010, and Winegar, 2008), and in the spirit collegial research, this study built upon those earlier projects and added to the body of knowledge regarding homeland security curricula.

Of particular note, two recent doctoral dissertation studies mentioned above were conducted (Bradshaw, 2011 and France, 2012), which examined the necessary components of a homeland security curriculum. In both studies, the researchers utilized

the Delphi technique to poll a panel of subject matter experts to reach consensus on the required curriculum elements of an undergraduate homeland security degree program.

Bradshaw (2011) surveyed approximately 20 participants in his study and identified 13 unique subject matter areas that should be considered as essential courses in an HS curriculum:

1. Information Sharing of Intelligence.
2. Introduction or History of Homeland Security.
3. Security Issues related to Homeland Security.
4. Disaster Response and Recovery as part of Risk Management.
5. National Response Plan and Framework.
6. National Strategy as part of Emergency Management.
7. Intelligence as it applies to Technology.
8. Threat Analysis and Vulnerability.
9. Exercises and Evaluation Program.
10. Information Management.
11. Surveillance Detection as applied to Training and Development.
12. Psychology of Terrorism as part of Risk Management.
13. National Infrastructure Protection Plan as part of Security. (p. 111)

The following year, France conducted a similar Delphi-based qualitative study which "examined the knowledge, skills, and abilities deemed important in homeland security in order to determine the emphasis to be placed in designing reliable homeland security education programs" (2012, p. 75). France's study surveyed a panel of 16

homeland security subject matter experts to arrive at a list of eight essential topic areas for a homeland security curriculum:

1. Homeland Security Fundamentals.
2. Intelligence and Information Sharing.
3. Interagency Coordination and Collaboration.
4. Leadership and Ethics.
5. Terrorism/Counter-terrorism.
6. Emergency Management.
7. Private/Public Partnerships.
8. Critical Infrastructure. (p. 103)

In addition France's study identified a list of five essential skills and abilities needed by homeland security program graduates and generated a list of eight criteria to serve as benchmarks in an academic homeland security program (2012).

It is interesting to note that the studies by Bradshaw (2001) and France (2012), while developing a list of key courses and essential topics, did not attempt to construct a set of program-specific objectives that could utilized by HS faculty to develop a unified, standardized undergraduate curriculum – one that could be easily reviewed and approved by a national accrediting body. Winegar (2008) astutely pointed out that institutions offering a homeland security degree that has been accredited by a recognized organization would provide a quality degree that is "rare and exclusive, with much higher inherent value" (p. 51). With that in mind, this researcher chose to build upon these earlier studies, and using the ERAU report (Ramsay et al., 2010) as a case study model,

sought to develop via Delphi consensus a standardized homeland security undergraduate degree curriculum.

Outcomes-based Education in Curriculum Development

The field of education has long recognized the principles and theories of outcomes-based education, which emphasize result-oriented thinking. Harden, Crosby, & Davis (1999), defined outcome-based education (OBE) as a way of designing, developing, delivering, and documenting instruction in terms of its intended goals and outcomes. Andrich (2002) posited that an outcomes-based education program must describe actual student learning experiences that can be assessed in light of measurable performance metrics. Other studies, namely, (Dreyer, 2001; Olvier, 1998; & Spady, 1994), have identified that OBE is a process with a focus on mastering what is to be learned, and the outcome is a demonstration of that learning. Finally, Stiehl and Lewchuk (2005) note that "teaching toward learning outcomes requires a sense of connection between courses (learning experiences) and a sense of collective responsibility for assessment (standards) and student success" (p. 2), strengthening this researcher's position on the need for a standardized, outcomes-based curriculum in homeland security..

Therefore, outcomes-based education should lead to specification of specific student outcomes that can be measured by educational assessment. One four-year study of an outcomes-based approach in pharmaceutical education showed that "the curriculum development process had been effective in improving the development of both professional and generic capabilities of the graduates" (Ho et al., 2009, p. 7). To add further credence to the theory of outcomes-based education, one merely has to look at a

private university in Wisconsin, Alvero College, that has over three decades of experience with OBE and has "earned a national and international reputation for being an outstanding example of outcomes-based academic programs that lead to student success" (Savagian, 2009, p. 1115). This researcher feels the success of OBE can be emulated at institutions offering standardized degrees in homeland security.

Lawson and Askell-Williams (2007) held that there are two common approaches to OBE: (a) transitional and (b) transformational, with the first focusing on mastery of subject-related outcomes and short-term problem-solving skills, and the second approach organized around the achievement of outcomes that will enable students to fulfill the complex roles in society as young adults. Most institutions of higher learning today, with an emphasis on essential learning, seemingly focus their curricula on transitional OBE, but also recognize the need for an element of transformational OBE (Killen, 2000). According to Lohmann (2001), universities and colleges throughout the United States are increasingly being required by their accreditation organizations to demonstrate an appropriate self-regulating processes in place to assure that they are achieving the institution's stated missions and goals. This educational concept can be a valuable tool in the training of undergraduates in the field of homeland security, because it focuses on the outcome of the education (what knowledge, skills, and abilities the graduates have earned) rather than on the input to the education.

Outcomes Based Education (OBE) has been referred to as standards-based education, since it essentially creates specific, concrete, measurable standards in an integrated curriculum framework. These standards then apply across the curriculum of a degree program. In addition, such elements as criterion-referenced tests based on these

standards rather than norm-based relative rankings, are employed in an OBE system to outline what students need to know, understand, and be able to do (Hollweg & Hill, 2003).

In order to implement an effective OBE program, on might choose to examine the works of two authors, Spady and Towers. Spady (1994) developed four essential principles of OBE: (a) clarity of focus, which means that everything faculty do must be systematically focused on helping students develop the KSAs to achieve the stated outcomes; (b) designing back, which means that curriculum content must flow from general to specific outcomes, and act as building block for the student's mastery of the long-term outcomes specified; (c) high expectations, in which faculty must establish high, challenging learning experiences and set goals of high standards for all learners; and (d) expanded opportunities, whereby the curriculum makes *what* and *whether* students learn successfully more important than *when* and *how* they master the desired outcomes. Towers (1996) further characterized OBE and went on to list four elements that are necessary to make an OBE program successful. First, what the student is to learn must be clearly identified. Second, the student's progress must be based on demonstrated achievement. Third, multiple instructional and assessment strategies must be available to meet the needs of each student. Fourth, adequate time and assistance must be provided so that each student can reach their maximum potential. The essence of OBE was nicely summarized by Killen (2000), "Outcome-based education clearly focuses on organizing everything in an educational system around what is essential for all students to be able to accomplish successfully at the end of their learning experiences" (p. 2).

One of the most important elements of outcomes-based education is the ability to measure the student's successful completion of the learning objective. In order to meet that requirement, the researcher ensured that all of the outcomes and objectives generated by the current research study were tied to the rubric presented in Bloom's taxonomy, which refers to a classification of the different learning objectives set for students. Huitt (2009) explains Bloom's taxonomy as a classification system where learning at the higher levels is dependent on having attained prerequisite knowledge and skills at lower levels. The six generally recognized levels of Bloom's taxonomy in the cognitive domain are, from lowest to highest, (a) knowledge, (b) comprehension, (c) application, (d) analysis, (e) synthesis, and (f) evaluation. In Bloom's taxonomy, an objective should begin with an action verb aligned with the level of cognition for that objective. For example, the first level of cognition is *knowledge*, or the recall of information, and some of the action verbs associated with that level of learning are: define, identify, know, list, name, recognize, and state (Orlich, Harder, Callahan, Trevisan, & Brown, 2010). The researcher and the participants of this current study both recognized the importance of choosing the right action verb to accompany the stated learning outcome/objective, and that became an important factor in reaching consensus on the description of each program-level learning objective.

In order to develop measurable program-level outcomes in an HS undergraduate degree, this study examined the model used by the Accrediting Body for Engineering and Technology (ABET), the largest, most established accrediting body in the U.S, as a potential exemplar. Since 2000, ABET has used outcomes-based assessment to measure the effectiveness of program-level outcomes (ABET, 2008). As a Council for Higher

Education Accreditation (CHEA) member, ABET believes that accreditation requires, among other things, degree programs must adhere to a set of quality standards that are outcomes-based and are measurable (CHEA, 2009). Following the example of ABET and CHEA, this researcher's study also posited that there should be baseline standards for an academic homeland security curriculum, and that these standards should be based on measurable, outcomes-based, program-level requirements.

During the literature review on the topic of OBE, the question arose as to whether the concept of a learning *objective* is the same as or different from the concept of a learning *outcome*. According to several studies (Harden, 2002; Melton, 1997; and Prideaux 2000) the term outcome is often an alternative name for objective, and the terms have in fact been used interchangeably, which begs the question whether such differences matter significantly in the larger scheme of curriculum development. Therefore, in this study, the term *objective* was used to define the specific learning outcomes that students should master to be able to successfully complete a course of study.

The educational concept of identifying core competencies (KSAs) and measuring the effectiveness of how these are taught can be a valuable tool in the training of undergraduates in the field of homeland security, because it focuses on the outcome of the education (what knowledge, skills, and abilities the graduates have earned) rather than on the input to the education. However, Lorenzen (2004) reminded the educator that in order for OBE to be effective in the classroom or lecture hall, there must be clarity of focus so that planners and teachers alike have a clear goal on what they want the students to be able to do successfully. Further, the curriculum must be constructed with the desired exit outcomes first and all instructional plans built from there.

Outcomes-based education, or as it is sometimes called, standards-based or performance-based education, is not new. According to DeJager and Nieuwenhuis (2005), a significant educational trend operating in the world today is that of outcomes-based education. Traditional curricula may have been more subject-based in the past; however, the transition to more competencies-based approaches is beginning to take place within the university sector as a whole (Edgren, 2006). A study that examined the future directions of business education (Lambrecht, 2007), showed that core competencies are being used to redefine and shape outcomes-based curricula across many academic degree programs in recent decades. While developing a core competency model for a graduate degree program, Calhoun, Ramiah, Weist, and Shortell (2008) found that educators across diverse disciplines agree that competency- or outcomes-based education can improve individual performance, enhance communication and coordination across courses, and provide an impetus for curriculum development. The bottom line is that employers have recognized the value of employees who bring a validated set of KSAs to the field of homeland security, and are willing to reward those skills with higher starting pay (Marks, 2002).

The move towards outcomes-based education can be compared to the shift towards total quality management in business and manufacturing. The development of performance standards and the identification of outcomes are highly relevant to quality management in both educational systems and large organizations (DeJager & Nieuwenhuis, 2005). Outcomes Based Education supports a belief that the best way for a student to learn what they need to know to be successful in their given field is for the organization to determine what the finished product should be and then work backwards

to determine and develop the most effective way to achieve that desired end state. That is why this current study will include the Delphi technique to achieve consensus from a panel of experts in the field who help develop educational curricula and can help determine what a graduate of a homeland security degree should know.

An article published in the *Education Commission of the States*, listed some of the advantages of using OBE are that it: (a) promotes high expectations and greater learning among all students, (b) prepares students for life and work in the 21st century, (c) fosters more authentic forms of assessment (i.e., students write to objective tests and measurements), and (d) encourages development of curriculum and teaching methods at the local level (NCREL, 1995).

In 2004, the National Academy of Engineering published a report entitled *The Engineer of 2020*, which centered on an effort to predict the roles that engineers will play in the future. This publication presented ideas that could be used to help transform engineering curricula into an outcomes-based approach, which would serve to position engineering education in the United States to better educate graduates to perform in a dynamic, technology-oriented field (NAE, 2004).

Specifically, the NAE report found that the attributes needed for the engineering graduates of 2020 should include such traits as strong analytical skills, creativity, ingenuity, professionalism, and leadership. These findings dovetail nicely with the assumptions made in this case study, in that the homeland security program is also an evolving field, subject to political changes, technological improvements, and global events.

Further, a 2005 National Research Council workshop including participants from academia, defense, security, and the military, concluded that there are four basic functions for higher education regarding homeland security:

1. Provide an educational path that would permit entry into a career supporting the goals of homeland security.
2. Provide relevant content knowledge, both specialized and generalized for those who need it.
3. Provide education for citizens, informing them about threats and methods of dealing with the threats.
4. Provide a forum for public debate. (p. 5)

This NRC study suggests that not only students but the general public should be included in the educational process of recognizing and managing the complex threats posed by homeland security issues.

Several other studies, most notably (Lizzio & Wilson, 2004; Lizzio, Wilson, & Simons, 2002; Rompelman, 2002) have addressed the issue of graduate preparedness for entering the workplace. Employers are increasingly looking for transferable knowledge and skills. Transferable in this context means that KSAs acquired while in the university are, to the largest extent practicable, directly applicable to the needs of homeland security field. Collins (2008) discussed the idea of outcomes-based training as a necessary part of any engineering curricula, adding that "students must have the opportunity to put knowledge and skills into practice" (p. 3).

More recent studies have begun to take an initial look at what specifically should make up an HS curriculum. In their study on HS curricula development, Ramirez and

Rioux (2012) conducted an Education Needs Assessment, surveying over 5,000 members of Department of Homeland Security (DHS) agencies across the country. The participants were asked to rank a list of 52 courses and subject areas in terms of importance to an undergraduate degree in homeland security using a Likert scale from 1 to 4. The list of topics was derived from existing HS curricula, journal articles, and textbooks. As a result, the study compiled the responses from the DHS participants and published the top twenty subject and course areas with the highest mean rankings. Interestingly, of the top ten subjects from the study, only four relate specifically to homeland security (terrorism, fundamentals of HS, disaster and terrorism, and immigration law), while the remaining six subjects focus more on general education areas (critical thinking/analytical skills, ethics, technical writing, English composition, informational and descriptive oral communication, and interviewing skills).

France (2012), in his doctoral dissertation employed the Delphi methodology to iteratively survey a panel of 16 HS subject matter experts to determine today's educational needs of the HS professional community. France's study, parallel to the one conducted by this researcher, identified several essential topic areas of knowledge, posited several essential skills and abilities, and presented a set of criteria to serve as benchmarks when developing an HS curriculum. The final sentence in the dissertation's abstract states, "Future research should focus on delivery methods that ensure homeland security practitioners and leaders have the knowledge, skills, and abilities deemed important" (France, 2012, p. iv). Therefore, the purpose of this current research project was to build upon the studies listed above and derive not only core academic areas that should be included in an HS baccalaureate degree program, but hopefully to also identify

some of the key student learning outcomes (called program specific objectives or PSOs in the current study) associated with the those core academic areas.

Quality education demands a process of continuous improvement by systematically and collectively evaluating and refining the system, practices, and culture of educational institutions in order to meet the needs of the customers and constituents. This is certainly true in the dynamic field of academic homeland security, where missions, policies, and doctrines are subject to change as new threats emerge and successive Administrations grapple with asymmetric terrorism and natural disasters. As a pedagogical tool, outcomes-based education can be used to reshape accreditation and certification across the discipline of academic homeland security, making certain that graduates of an HS program are equipped with the KSAs to deal with emergent threats.

Accreditation

Accreditation in U.S. postsecondary education is both a mechanism and a process that provides a measure of public accountability that graduates have mastered a baseline set of knowledge and skill in order to function as required in specific professional venues. The goal of accreditation is to ensure that education provided by institutions of higher learning meets acceptable, published levels of quality (DOE, 2009). For example, society has determined that degree programs such as medicine, law, nursing, engineering or accounting represent professions that require their practitioners to demonstrate such a baseline skill or knowledge set. As such, organizations that accredit academic programs can provide guidance to academic institutions that develop and maintain degree programs (Eaton, 2006). Over time, accreditation has evolved. Early on, accreditation was very process oriented and typically required academic programs to offer a given set of classes

in a prescribed sequence and set of topics. The presumption being that students passing such classes had indeed mastered the knowledge or skill set required in their profession. While a process orientation had a certain appeal, problems associated with such an assumption included the need for academic programs to continuously offer classes that were (at least superficially) tied or matched to professional requirements and the simple observation that passing grades didn't always equate to a mastered skill (McNeir, 1993).

In the last decade, academic accreditation has evolved and has moved away from a rigid process orientation (i.e., a required list of courses) and instead has moved toward a set of outcomes that represent behaviors, skills and knowledge practitioners need to possess in order to function in their profession (McNeir, 1993). Ben-David (1999) noted that outcomes-based requirements require both institutions and academic programs to demonstrate that their constituents (e.g., students) have an appropriate set of knowledge, skills and behaviors required by the profession. As such, outcome-based programs are incentivized to work in closer partnership with their professional constituents and to concentrate on teaching/evaluating their students on things that matter to practitioners. The presumption with such outcomes-based accreditation in higher education is that it is a powerful means of ensuring degree integrity and quality (Harden, Crosby, & Davis, 1999).

In higher education, accreditation can encompass both institutions and individual programs. Institutions can be accredited by organizations recognized by the U.S. Department of Education, such as the North Central Association of Colleges and Schools. Academic programs can be accredited by an organization (such as ABET) (ABET, 2008). Enhancing the reliability and credibility of the accreditation process, accrediting bodies

are professional organizations such as ABET, and are often recognized by either the U.S. Department of Education (USDE) or the Council on Higher Education Accreditation (CHEA) (CHEA, 2009). For example, ABET is recognized as an accrediting body by CHEA. However, not all programs in higher education pursue or maintain accreditation. Further, although most accrediting bodies manage and adjudicate accreditation procedures and decisions, they neither develop nor maintain the program level outcomes that define or characterize a field or profession. This is usually done by consensus inside professional associations that represent a given field. As an example, the Education Standards Committee in the American Society of Safety Engineers (ASSE) develops and maintains the ABET criteria for academic safety programs (ASSE, 2009).

Recognizing the need to teach graduates the knowledge, skills, and abilities that are tied to program-level outcomes, ABET adopted the new set of standards in 1996, called *Engineering Criteria 2000* (EC2000). EC2000 shifted the basis for accreditation from inputs, such as what is taught, to outputs, what is learned. In 2002, ABET commissioned a study to assess whether the implementation of its 11 new evaluation criteria , known as EC2000, had the intended effects of implementing an outcomes-based education methodology that led to improved student learning outcomes. The new criteria specify 11 learning outcomes, as listed below, and require programs to assess and demonstrate their students' achievement in each of those areas (ABET, 2006).

1. An ability to apply knowledge of mathematics, science, and engineering.
2. An ability to design and conduct experiments, and analyze and interpret data.
3. An ability to design a system, component, or process to meet desired needs.
4. An ability to function on multi-disciplinary teams.

5. An ability to identify, formulate, and solve engineering problems.
6. An understanding of professional and ethical responsibility.
7. An ability to communicate effectively.
8. The broad education necessary to understand the impact of engineering solutions in a global and societal context.
9. A recognition of the need for, and an ability to engage in life-long learning.
10. A knowledge of contemporary issues.
11. An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice. (p. 4)

The EC2000 study utilized a cross-sectional, pre- and post-EC2000 design that drew on multiple sources of evidence to provide an analysis of the impact of the EC2000 accreditation criteria on the preparation of undergraduates for careers in engineering (Volkwein et al., 2004). As the first national study of an OBE accreditation model, the ABET EC2000 report indicated clearly that the implementation of the outcomes-based accreditation criteria had a positive, substantial, impact on engineering programs, student experiences, and student learning. Comparisons of 1994 and 2004 graduates' self-reported learning outcomes show 2004 graduates as measurably better prepared than their counterparts in all the learning areas assessed (ABET, 2006; Collins, 2008). This report provides empirical data that validates the success of implementing outcomes-based curricula for an engineering degree program. This researcher believes that the development of a homeland security degree program can benefit equally from incorporation of OBE into its curricula and subsequent accreditation standards.

Among other components, program level accreditation usually requires each academic program to demonstrate at least five things: (a) how their program meets the mission of the college and university; (b) how their students achieve the educational objectives set by the program; (c) how the needs of the program's constituents are reflected in the program and how the program meets those needs; (d) demonstrate that the program's students accomplish the required program level outcomes; and (e) that the program has adequately trained and qualified faculty, resources and institutional support (DOE, 2009). Modern accreditation does not confine curriculum development. Accreditation is crucial to ensuring that academic programs are successful and sustainable, and enables a program to demonstrate that they have achieved a defensible level of integrity, outcomes-based performance, and continuous quality improvement (Heyman & Carafano, 2008). A model curriculum does not restrict an academic program into inflexibility; rather, it should consist of a professionally recommended set of learning outcomes coupled to a measurable learning level rubric such as Bloom's taxonomy (Huitt, 2009). In this way, accreditation serves to guide the curricular development of a program over time, allows programs to consistently monitor and meet the needs of its constituents, assures degree integrity and helps to reduce the potential for fraudulent degree programs (CHEA, 2009). Incidentally, accreditation also would provide a template for new programs. Indeed, OBE accreditation preserves, protects and helps disseminate the intellectual core of any profession, including homeland security.

In a paper submitted to the Federal Emergency Management Agency (FEMA) Higher Education Program, Spiewak (2011) laid out the groundwork for developing an accreditation program for emergency management degree programs at institutions of

higher learning. This paper posited that it was probably not a good idea to have a federal agency, such as FEMA, in charge of accreditation and telling universities and colleges what they could or could not teach. (This conviction was upheld by the participants in the current study). Spiewak went on to note the professional organization that was chartered to develop accreditation standards for the field of emergency management – the Foundation for Higher Education Accreditation (FFHEA). This foundation, while originally chartered to develop education standards for emergency management curriculum only, could at some point in the future, become the national accrediting body for academic homeland security as well, since the two fields are so closely intertwined.

Case Study Research

Qualitative research designs are naturalistic to the extent that the research takes place in real-world settings and the researcher does not try to manipulate the data (Patton, 2002). Rather than using samples and following a rigid protocol to examine limited number of variables, case study methods involve an in-depth, longitudinal examination of a single group, incident, or community. They provide a systematic way of looking at events, collecting data, analyzing information, and reporting the results. Zikmund (2003) noted that case study methodology is performed to obtain data from one or more situations that are similar to the problem in which the researcher is interested. This is why qualitative case research was used in this study to examine and validate the results of a similar, earlier study. According to Yin (2003), "the case study is but one of several ways of doing qualitative social science research, and is the preferred strategy when the focus is on a contemporary phenomenon with real-life context" (p. 1). The focus of a case study need not be limited to a single individual, but can examine a classroom, a school, an organization, or policy (Gay & Airasian, 2000). A qualitative case study can

be: (a) particularistic, focusing on a particular situation, program; (b) descriptive, which is a rich, thick description of a phenomenon under study; or (c) heuristic, designed to illuminate the reader's understanding on a new experience (Shank, 2006).

The case study method is an active strategy that engages the researcher, fosters higher order thinking, and facilitates problem-solving in nascent fields of study (Klitz, 2009). Patton (2002) posited that well-constructed case studies are holistic and context sensitive, meaning that the whole is understood to be greater than the sum of its parts, and that the context in which the case study is performed is crucial to the documentation of the organizational culture examined. According to Trochim (2001), there is no single way to conduct a case study, and a combination of surveys, interviews, and observations can be used. Hence, one acceptable method of conducting a case study would be use of the Delphi technique (see following paragraph). A focused review of recent literature showed that case study methodology was successfully coupled with the Delphi technique in several instances to explore and describe research questions on a wide variety of topics, including curriculum development (Kerrigan, 2005; Lee, 2006; Quinn, 2007; Siccama, 2006; Stewart, 2008).

The Delphi Technique

This qualitative study utilized an iterative, on-line survey based on the techniques of the Delphi method to reach consensus of the elements of an outcomes-based undergraduate degree curriculum in homeland security. The Delphi method, first developed at the RAND think tank in California in the 1960s, has been used as a unique research tool that encourages a true debate of specified topics, independent of personalities (Linstone & Turoff, 2002). Von der Gracht further reports, "Since its

introduction to the public in 1964, the Delphi technique has been the chosen methodology of a vast amount of research and business studies" (2008, p. 32).

Delphi refers to the classical city of Greece and was home to the Priestess Oracle that made predictions about the future that were always true (Dennington, 2004). The Delphi method, which can be used to generate the maximum level of consensus among experts around a specific issue, earned its name from a U. S. Air Force-sponsored defense research study in the early 1950s, called *Project Delphi* (Clark, 2006). Von der Gracht (2008) states three fundamental rationales for using the Delphi technique in research: (a) it leverages the superiority of group performance over individual performance, (b) it purports that experts, when they reach consensus, are more likely than non-experts to be correct about questions in their field, and (c) the technique produces convergence of expert opinion over successive rounds and iterations.

According to Gordon (1994), "the aspects of anonymity and feedback represent the two irreducible elements of the Delphi method" (p. 1). Gordon further observed that anonymity helped eliminate the force of oratory and pedagogy and the variance of extreme opinion when dealing with expert panelists. When using the Delphi methodology, this degree of confidentiality is necessary in the sense that no one on the selected panel should know who else is participating, except of course, for the researcher. The second key component in a Delphi technique, the element of feedback, assists the Delphi process in that responses are synthesized by the researcher, giving each an equal weight and then are fed back to the panel as a whole for further analysis and consensus. Iterative feedback assists the researcher in the fact that multiple rounds tend to produce a greater degree of agreement and consensus among the panel members.

The Delphi method can be most effective in educational research when the problem does not lend itself to precise analytical techniques but can benefit from subjective judgments on a collective basis. This is especially relevant when the individuals chosen to be on the Delphi panel have no history of interaction and represent diverse backgrounds. From a cost-benefit perspective, the Delphi technique can be economical when more individuals are needed than can effectively interact in a face-to-face exchange, or when time and cost make frequent group meetings infeasible. Lastly, the Delphi methodology, by using anonymity, preserves the heterogeneity of the panel members and may actually increase validity by avoiding the potential of one strong personality dominating the group (Linstone & Turoff, 2002). Rowe and Wright (1999), noted that the Delphi technique is not a procedure intended to challenge the members of statistical or model-based procedures, against which human judgment is generally shown to be inferior: it is intended for use in judgment and forecasting situations in which pure model-based statistical methods are not practical or possible because of the lack of appropriate data, and thus where some form of human judgmental input is necessary.

As explained in the previous paragraphs, a case study is a common research strategy when one wishes to conduct an in-depth examination of how something was accomplished and how that particular event (case) relates to a similar research problem (Yin, 2003). As a case study, this project exemplifies some crucial issues in applying the Delphi research methodology. The Delphi technique has been successfully employed as a qualitative research methodology to identify the core competencies of educational curricula in a variety of recent studies (e.g., Banwell, Hinde, Dixon, & Sibthorpe, 2005; Clark, 2005; DeLeo, 2002; France, 2012; Hall, 2006; McCool, 2008; Paes & Wee, 2008;

Parr, Trexler, Khanna, & Battisti, 2007; Pfleger, McHattie, Diack, McCraig, & Stewart, 2008; and Pollard & Pollard, 2004). Specifically, Katz (2004) stated that "the Delphi technique is recommended for program and curriculum development, particularly in emerging fields where there is no recognized standard for curriculum" (p. 49). Additionally, Hatcher and Colton (2007), observed that "the Delphi technique was proven to be an excellent tool in establishing content validity for adult learning principles" (p. 1).

Consequently, this qualitative research project used a case study approach rooted in the Delphi technique to validate earlier studies into the program elements of an undergraduate HS degree. In these earlier studies by Bradshaw (2011), France (2012, and particularly Ramsay et al. (2010), the Delphi technique, via an on-line survey, was used to reach consensus of the elements of an outcomes-based undergraduate degree curriculum in homeland security. That earlier research is the subject of this current case study, which employed the same iterative, consensus-building methodology. Patton (2002) noted that the Delphi technique could be called a prospective study, in that researchers can interview key SMEs in the field to solicit consensus on the latest and best thinking about a proposal or idea.

As with any research method, the Delphi method has its own inherent strengths and weaknesses. Gordon (1994) cited one of the weaknesses is that Delphi studies are difficult to perform well because of the great deal of time and attention that must be expended to execute them. Gordon also goes on to say that, the survey form must be crafted meticulously and tested rigorously to avoid ambiguity. Bowles (1999) listed the strengths of the Delphi method as: (a) ability to develop qualitative data, (b) ability to

provide controlled, anonymous feedback, (c) its goal of consensus reaching, and (d) its flexibility and tolerance of panelist personalities. Snyder-Halpern, Thompson, and Schaffer (2000) noted in their study on application of the Delphi technique that there are both advantages and disadvantages associated with the Delphi methodology, with the main advantages being "an adaptability to diverse data collection strategies, decreased peer pressure due to anonymity, and ease of condensing opinions of many experts into a few precise statements" (p. 810). Potential disadvantages listed in the Snyder-Halpern et al. study were the difficulty in defining and locating subject matter experts for certain topics and the potential for data collection to stretch on for extended periods. Loo (2002) further analyzed the Delphi technique and recommended it for its ability to enable the moderator to build upon earlier results and to maintain focus in the study. All of these findings further strengthened this researcher's decision to employ the Delphi technique in the current study.

Another study, Landeta (2006), compiled data on half a century of using the Delphi method in social science research and identified both strengths and weaknesses in the methodology. Potential weaknesses noted were: who qualifies as a subject matter expert (SME); what biases does each SME bring to the research; is consensus really a way to verify the truth; does anonymity encourage impunity on the part of the SMEs; and can the person conducting the study perform manipulation of the data to achieve a desired outcome? Landeta's study also found that despite these potential shortcomings, the Delphi technique produced positive results as compared with other classical qualitative research methodologies (2006).

In a follow-on study, Holey, Feeley, Dixon, and Whittaker (2007), observed that "Delphi studies have been used successfully to develop and identify consensus by experts on a given topic" (p. 2). Their report went on to suggest that consensus is the same as agreement, and that "agreement can be determined by an aggregate of judgments, or by a move to a level of central tendency, or by confirmation of stability in the consistency of answers between successive Delphi rounds (Holey et al., 2007)

Thus, the major strength of the Delphi method is its ability to collect consensus via expert opinions and synthesize new, alternative solutions. The major weakness of the Delphi methodology planned for this researcher's study was that the panel was comprised only by members of UAPI, which represented a convenience sample of SMEs in the HS field. However, the rather homogenous professional representation in the Delphi panel was not necessarily a drawback since the study's aim was to generate core competencies and program-level outcomes for an HS degree program. According to Adler and Ziglio (1996), valid policy recommendations and alternative, innovative strategies can still be achieved with small, homogeneous panels.

The literature review indicated a Delphi process over a traditional survey, based on a comparison of the methodologies as depicted in Table 1.

Table 2

Comparison of traditional survey with Delphi method

Evaluation criteria	Traditional survey	Delphi study
Summary of procedure	The researchers design a questionnaire with questions relevant to the issue of study. There are numerous issues concerning validity of the questions they must consider to	All the questionnaire design issues of a survey also apply to a Delphi study. After the researchers design the questionnaire, they select an appropriate group of experts who

Evaluation criteria	Traditional survey	Delphi study
	develop a good survey. The questionnaire can include questions that solicit quantitative or qualitative data, or both. The researchers decide on the population that the hypotheses apply to, and selects a random sample of this population on whom to administer the survey. The respondents (who are a fraction of the selected random sample due to non-response by some) fill out the survey and return it. The researchers then analyze the usable responses to investigate the research questions.	are qualified to answer the questions. The researchers then administer the survey and analyze the responses. Next, they design another survey based on the responses to the first one and re-administers it, asking respondents to revise their original responses and/or answer other questions based on group feedback from the first survey. The researchers reiterate this process until the respondents reach a satisfactory degree of consensus. The respondents are kept anonymous to each other (though not to the researcher) throughout the process.
Representativeness of sample	Using statistical sampling techniques, the researchers randomly select a sample that is representative of the population of interest.	The questions that a Delphi study investigates are those of high uncertainty and speculation. Thus, a general population, or even a narrow subset of a general population, might not be sufficiently knowledgeable to answer the questions accurately. A Delphi study is a virtual panel of experts gathered to arrive at an answer to a difficult question. Thus, a Delphi study could be considered a type of virtual meeting or as a group decision technique, though it appears to be a complicated survey.
Sample size for statistical power and significant findings	Because the goal is to generalize results to a larger population, the researchers need to select a sample size that is large enough to detect statistically significant effects in the population. Power analysis is required to determine an appropriate sample size.	The Delphi group size does not depend on statistical power, but rather on group dynamics for arriving at consensus among experts. Thus, the literature recommends 10-18 experts on a Delphi panel.

Evaluation criteria	Traditional survey	Delphi study
Individual vs. group response	The researchers average out individuals' responses to determine the average response for the sample, which they generalize to the relevant population.	Studies have consistently shown that for questions requiring expert judgment, the average of individual responses is inferior to the averages produced by group decision processes; the Delphi method bears this out.
Reliability and response revision	An important criterion for evaluating surveys is the reliability of the measures. Researchers typically assure this by pretesting and by retesting to assure test-retest reliability.	Pretesting is also an important reliability assurance for the Delphi method. However, test-retest reliability is not relevant, since researchers expect respondents to revise their responses.
Construct validity	Construct validity is assured by careful survey design and by pretesting.	In addition, the Delphi method can employ further construct validation by asking experts to validate the researcher's interpretation and categorization of the variables. The fact that Delphi is not anonymous (to the researcher) permits this validation step.
Anonymity	Respondents are almost always anonymous to each other, and often anonymous to the researcher.	Respondents are always anonymous to each other, but never anonymous to the researcher. This gives the researchers more opportunity to follow up for clarifications and further qualitative data.
Non-response issues	Researchers need to investigate the possibility of non-response bias to ensure that the sample remains representative of the population.	Non-response is typically very low in Delphi surveys, since most researchers have personally obtained assurances of participation.
Attrition effects	For single surveys, attrition (participant drop-out) is a non-issue. For multi-step repeated survey studies, researchers	Similar to non-response, attrition tends to be low in Delphi studies, and the researchers usually can easily ascertain the cause by

Evaluation criteria	Traditional survey	Delphi study
	should investigate attrition to assure that it is random and non-systematic.	talking with the dropouts.
Richness of data	The richness of data depends on the form and depth of the questions, and on the possibility of follow-up, such as interviews. Follow-up is often limited when the researchers are unable to track respondents.	In addition to the richness issues of traditional surveys, Delphi studies inherently provide richer data because of their multiple iterations and their response revision due to feedback. Moreover, Delphi participants tend to be open to follow-up interviews.

Note: Adapted from "The Delphi method as a research tool: an example, design considerations and applications," by C. Okoli and S. Pawlowski, *Information & Management 42* (2004), pp. 19-20.

In the study from which Table 1 is adapted, Oloki and Pawlowski (2004) found that: (a) Delphi studies enable questions regarding complex issue to be answered by people who understand the issues more appropriately; (b) a Delphi group panel study is desirable in that it does not require the experts to meet physically, which could be impractical for geographically dispersed experts; (c) although there may be a relatively limited number of experts with knowledge about the topic, the Delphi panel size requirements are modest; and (d) the Delphi study is flexible in its design, and because of its iterative, consensus-building nature, enables collection of richer data leading to a deeper understanding of the fundamental research questions. For these reasons, and others discovered during the literature review, the researcher chose the Delphi technique as the primary method of data analysis for this qualitative research study.

Finally, while the Delphi technique may be similar to other consensus-building methodologies such as Quality Function Deployment (QFD), there are subtle differences which make the Delphi process more suitable for this study. The Delphi technique is a

qualitative methodology whereby anonymous generation of opinions and ideas relating to an abstract issue are collected in iterative rounds from a selected panel. Katz (2004) noted that the qualitative methodology of the Delphi technique is preferred when developing academic programs, particularly in emerging fields, where there is no recognized standard for curriculum. QFD on the other hand, is a quantitative methodology, developed and promoted as a tool for improving supplier responsiveness to customer demands in a continuous improvement, or customer satisfaction context. QFD takes customer requirements and translates them into technical components and enhancements at any of the production stages in industry (Caldwell, 2009).

Summary

The need for development of standardized, outcomes-based curriculum for the academic field of homeland security was apparent from the observations in Chapter 1 and the literature review in Chapter 2. Academia's mission in developing future homeland security leaders is recognized by the DHS, in that the Science and Technology Directorate of the Department exhorted the academic community to, "educate and inspire the next generation homeland security of workforce" (DHS, 2009, para. 1). However, this researcher was not able to locate any significant, scholarly, peer-reviewed publications on developing an outcomes-based, standardized homeland security degree with program-level objectives at the undergraduate level. (Note: the ERAU study which did employ a small Delphi panel to establish select HS curriculum elements was published in the May 2010 edition of the *Homeland Security Affairs Journal*). In addition the doctoral dissertations by Bradshaw (2011) and France (2012) utilized a

similar Delphi research methodology, but did not delve into the outcomes-based approach and development of specific program learning outcomes that the current study examined).

With the field of homeland security so diverse, dynamic, and complex, it was difficult to narrow the literature search to a set of relevant topics applicable to this research. Therefore, the review of literature was limited to three topics: the advent of national homeland security strategy, concepts of outcomes-based education, and the Delphi method. After conducting the literature review, the researcher concluded that the Delphi technique was among the best research tools to use in conducting the proposed qualitative study, based on the research topic itself, and the benefit of cost-effectiveness and time-effectiveness achieved.

Chapter 3: Research Method

This qualitative research project used a case study methodology to closely examine and validate an initial study done by Embry-Riddle Aeronautical University (ERAU) (Ramsay et al., 2010) regarding the elements of an undergraduate degree in homeland security. This researcher's case study incorporated the Delphi technique, just as the earlier ERAU research utilized, but surveyed a larger population to increase validity and capture data from a different group. In addition, other recent studies (Bradshaw, 2011; France 2012; and Ramirez & Rioux 2012) were examined for concurrent themes relating to HS curriculum development.

Phase I of the current project vetted and validated the ERAU study, confirming the efficacy of the core academic areas (CAAs), overarching program objectives (OPOs), and program specific objectives (PSOs) as first delineated in that earlier study. Phase II used a self-reporting survey instrument to poll the members of University and Agency Partnership Initiative (UAPI) with the goal of obtaining basic demographic data on the participants and identifying additional elements of a homeland security curriculum at both the undergraduate and graduate level. The research project employed purposive, convenience sampling to obtain data. The data obtained in Phase II was examined using textual analysis and responses across the instrument were compiled into consensual elements to determine percent of agreement and/or disagreement on proposed learning objectives. In addition, a portion of the data was subjected to non-parametric analysis to determine the mean of the responses where a 5-point Likert scale was used.

Despite the fact that the concept of homeland security is finding its way into academia, there are currently no independent, national bodies that accredit homeland

security programs. Accredited universities and colleges may have homeland security programs that fall under the blanket of accreditation applied to the entire institution; however, the homeland security degree programs themselves are not accredited by a professional organization made up of homeland security professionals. This is the role/mission that HSDECA advertised they would be assuming; however, the organization has not published any curriculum standards to date. The Chairman of the HSDECA Accreditation Committee suggested that HSDECA might have a complete accreditation architecture by the end of 2010 (J. Ramsay, personal communication, December 10, 2009). (Note: since this research project was begun, HSDECA has diminished in scope and influence to the point that the organization in 2012 appears to no longer be a viable candidate for a national accrediting body for HS programs).

Further, research for this study revealed that there are no generally accepted or peer-reviewed program-level learning-based outcomes that fully define a bachelor's degree in homeland security. Therefore, a genuine need exists for a set of validated educational and program outcomes for the academic degree program in Homeland Security. Hopefully, the results of this study can be presented to any organization that steps up to become a national HS accrediting body as a model for curricula development in a homeland security academic program.

One of the major challenges facing all academic HS programs is what to teach and what outcomes to inculcate into their students. For the purpose of this qualitative study, the following question was addressed: what competencies (knowledge, skills, and abilities) should undergraduates in homeland security possess? In turn, this overarching question leads to the following more in-depth research questions:

Q1: What core academic areas (CAAs), overarching program objectives (OPOs), and program-specific objectives (PSOs) should comprise an undergraduate degree in homeland security?

Q2: What areas of overlap exist between this study's final set of CAAs, OPOs, and PSOs and those developed by earlier studies, particularly the Ramsay, Cutrer, and Raffel (2010) study?

Q3: What additional elements are of importance to the academic field regarding the development of an HS degree program?

Analysis of the data gathered from the research in this chapter should yield several benefits for the field of academic homeland security, including: (a) identification of a list of HS core academic areas, with associated program-specific objectives; (b) development of a consensus-driven list of overarching program objectives for an HS degree; and (c); feedback from participants regarding other specific needs for curricula requirements for degrees in HS.

Research Methods and Design

In the absence of a widely accepted, published set of accreditation outcomes that represents the HS profession, the researcher determined that developing a consensual set of standards using an expert panel was the next best alternative. As an initial point of comparison, the results from the earlier ERAU program (Ramsay et al., 2010) were examined using a case study approach. In that previous ERAU study, a small group of professionals (N=8) known in the HS field for expertise in a wide venue of issue areas including emergency management, homeland security law and policy, terrorism studies, critical infrastructure and risk analysis, law enforcement, and homeland defense, was

recruited to participate in a Delphi panel. According to Lee (2006), "the Delphi technique is one of the most efficient methods for uncovering implicit solutions that lie behind the opinions in the soft areas" (p. 60).

In this current qualitative case study, a similar methodology to the one used by Ramsay et al. (2010) was deployed, using a Delphi technique to achieve consensus among a larger population sample to validate the program outcomes of a homeland security curriculum. When quantitative statistical methods are not appropriate, and when research questions require a significant degree of expert opinion because of the inexact nature of the topic, the Delphi method becomes a reliable research methodology (Lee, 2006). Additionally, a culminating phase of this study deployed a self-reporting survey (using a Likert scale) to gather data from the survey population on other diverse elements that should go into development of a degree in homeland security.

The intent of all research is to solve a problem or answer a question (Trochim, 2001). Hence, this researcher's current study asked, what are the elements of an undergraduate degree in homeland security? To answer that question, and to anchor the methodology of this study to theoretical precepts of qualitative research and the iterative, consensus-building techniques of the Delphi method, the literature review in Chapter 2 indicated that the case study is a suitable research tool for this project. Leedy and Ormrod (2001) concluded that research design is the structure of the research, and that inclusive elements of a design structure are observations or measures. Characteristics found in a good research design are theory grounded, where good research strategies reflect theories that are being investigated; and situational, where the design reflects the setting of the investigation; and feasible, where the design can be implemented (Trochim,

2001). According to Yin (2003), there are five components of a case study: "(a) a study's question, (b) propositions, (c) units of analysis, (d) logic linking of data to the proposition, and (e) the criteria for interpreting the findings" (p. 21). Each of these components was addressed in this qualitative research project.

As stated, the qualitative case study approach was deemed appropriate for exploring the elements of a homeland security curriculum. Yin (2003) wrote, "the case study is but one of several ways of doing social science research" (p. 1). Yin went on to state that a qualitative case study method lends itself to allowing and maintaining the holistic and meaningful characteristics of real-life events, and is not experimental by design. The research for this project involved in-depth investigation into a study done by Embry-Riddle Aeronautical University into what constitutes a curriculum for an undergraduate degree in homeland security studies. An attempt was made to replicate as closely as possible, and thereby validate, the ERAU study (Ramsay et al., 2010) on a larger scale.

The qualitative method was used rather than quantitative because the research sought perceptions of panel members that could not be otherwise captured by survey alone (Yin, 2003). A qualitative case study was further indicated because of the limitation of time to perform research normally performed in longitudinal studies. The study did not use any experimental control over events and the focused on real-life, real-time context. This researcher's study was a qualitative-descriptive research design, meaning that the methodology involved only a subjective description of the research topic in nonnumeric terms (Wilson, 2007). Although case studies may tend to create an idealized situation by merely using descriptive accounts, according to Creswell (2008)

and Yin (2003), that particular form of research methodology is still determined to be the most suitable for this study. Case studies are guided by a series of questions that the research tries to answer, and they contribute to confirm, challenge, or extend the theory (Yin, 2003). In the final analysis, case studies provide in-depth, descriptive accounts of an issue under study. Case study research can be conducted by examining a specific phenomenon such as a program, an event, a process, an institution, or a social group. Additionally, case studies allow for gathering accurate data using confined subjects in a short period (Yin, 2004), which are all operating constraints of my research project.

Qualitative inquiry employs various knowledge claims, strategies of inquiry, and methods of data and analysis (Creswell, 2004). "Qualitative procedures rely on text and image data, have unique steps in data analysis, and draw on diverse strategies of inquiry" (Creswell, 2008, p. 179). According to Leedy and Ormrod (2001), qualitative research occurs in a natural setting, uses multiple interactive and humanistic methods, and is emergent rather than closely predefined. The interpretive nature of qualitative research means the researcher will interpret the data (Creswell, 2008). The patterns for comparison will be determined from the panels' responses to questions put forth using an iterative Delphi technique to achieve consensus on each element. In this study, consensus was considered as being reached on a particular element of a round when 75% of the participants agree. Consensus research can assume that a weakness in a single method will often be compensated by strengths of other methods (Creswell, 2008).

As stated, the Delphi technique was employed as the means to develop consensus from among the SMEs in the 2008 ERAU study, and that same technique was used in this researcher's study to reach consensus among a larger cohort of HS professionals

comprised of the members of UAPI. Cegielski (2008) found that because of the unique characteristics of the methodology, the Delphi technique was "particularly suited to research questions that deal with uncertainty in a domain of imperfect knowledge" (p. 34). Further affirmation of the Delphi technique being the appropriate research methodology for this study was found in earlier studies comparing group survey techniques, where Riggs (1983) and Rohrbaugh (1979), reported the Delphi technique achieved a greater level of accuracy than other group consensus techniques.

For this study, the researcher deployed a survey instrument similar to the one used in the initial ERAU study (Ramsay et al., 2010) to maintain validity. The survey was developed and fielded to deliver information and collect responses from the larger population of a purposive convenience sample. An information packet, containing material designed to discuss the survey completion and submission process and to educate the panel about accreditation principles, terms and the accreditation process in higher education was e-mailed to each panelist. This information packet included definitions of terms such as homeland security, accreditation, and program-level outcomes, so that the panelists had a common vocabulary from which to proceed.

Participants

Gordon (1994) stated, "The key to a successful Delphi study lies in the selection of the participants" (p. 6). The literature review conducted in Chapter 2 showed that the Delphi technique typically lists the selection of expert panelists as the first major phase of the methodology. Since the term *expert* is subjective; therefore, a researcher must quantify exactly what constitutes an expert for the purposes of a specific study. Typically, researchers select experts based on factors such as years of professional

service, job or position title, level of education, and professional certifications (Kerrigan, 2005). Participants for this study were comprised from the 338 members from the 2010 membership roster of the University and Agency Partnership Initiative (UAPI), who are considered experts in the field of academic homeland security/defense due to their education, judgment, skills, and experience. Using the consensus-driven initial results from the previous ERAU study, an expanded survey was distributed to the larger cohort of HS professionals, the members of UAPI, affording a higher degree of validity and reliability for this follow-on study, and allowing an additional comparative examination of the differences in curricular cores in homeland security. This sampling of the entire membership of UAPI was not a true random sample, but was more of a convenience, purposive sampling, due to the unique nature of the study.

The sampling frame consisted of a single group study of diverse homeland security SMEs using a convenience sampling technique. Participants for this study, although members of the same organization, came from diverse professional, ethnic, and cultural backgrounds from around the country. The research project used a pure logistical sampling strategy, or convenience sampling, with elements of purposive (expert) sampling. Convenience sampling is used to obtain data from a population that is convenient from both the aspect of economy and time (Patton, 2002). Purposive sampling is conducted by an experienced individual (the researcher in this case) who selects the sample population based on his or her judgment about certain characteristics required of the sample members (Shank, 2006). A purposive sampling selects individuals in the representative proportion of the population, but not randomly (Zikmund, 2003). Trochim (2001) stated that a subset of purposive sampling is expert sampling, and that

there are two reasons why expert sampling could be chosen. First, expert sampling is the best way to elicit the opinions of SMEs on selected topics. Second, expert sampling provides evidence of validity of another research approach. Using expert sampling in this study will serve to add validity to the methodology of the earlier ERAU study. Hence, the entire spring 2010 membership of UAPI was purposively chosen for the sample population because they are experts in the field of academic homeland security, and they were selected because they represent a convenient sample that can be surveyed quickly and economically, to stay within the timeline and budget of this research project. Creswell (2008) recommended research should first narrow the sample in groups or organizations, obtain names of individuals within the groups as potential participants to research, and then find commonality or differences among participants. Therefore, the participants for this study were chosen as subject matter experts (SMEs) based on commonality of their positions, duties, and knowledge within their specific field of endeavor in homeland security.

Lee (2006) noted that most Delphi studies identifying competencies of various occupations had a range of 50 to 100 panelists. However, in qualitative research, the sampling strategy used does not have to adhere to the rigid methodology of a quantitative study. According to Patton (2002), "qualitative inquiry typically focuses in depth on relatively small samples, even single cases, selected purposefully" (p. 230). What this means is that a qualitative study need not rely on the size of the population sample or random sampling as the key ingredient, but that sample size and target population should instead, focus on and complement the rationale of the study. Von der Gracht (2008) went on to state that, "In general, the objective of Delphi studies is not to obtain a

representative sample of a population as it is with most conventional surveys. Rather, Delphi researchers aim for a high inclusion of experts" (p. 42).

In this study, credibility was indicated by purposeful selection of highly experienced people for inclusion in the panel of SMEs, rather than relying on random sampling. This panelist selection method is corroborated by other Delphi studies (Cicek & Demirhan, 2001; Hanifin, 2004; Klink & Boon, 2002). As stated earlier, this researcher chose the sample population for the study as being a non-random group of selected HS practitioners – the membership of UAPI, who by virtue of their knowledge, skills, and abilities, have distinguished themselves as SMEs in the field. This group represented a convenience, purposive sample. Although the group of panelists that ultimately decided to complete the entire survey (an average of 40 respondents per round) was much smaller than the entire potential UAPI membership of 338, when considering the enormity of the field of homeland security, the population participating in this study was significantly larger than that of the 2008 ERAU study (which had eight panel members) on which this study was fashioned. The survey population for the study was focused and selective due to the fact that the field of homeland security is so new that there are not many high level practitioners who fully understand the academic connection.

Materials/Instruments

For this research project on developing a curriculum for an undergraduate homeland security degree program, the researcher utilized the case study methodology to examine and attempted to validate an earlier study done by Ramsay et al. (2010). The Delphi technique was used to develop outcome-based learning objectives. The Delphi

methodology employs the use of iterative surveys to develop from a group of expert panel members an agreed interpretation of an emerging topic area or subject for which there is little published data or a lack of consensus in the field to assist with making projections about the future (Day & Bobeva, 2005). Since the survey device used in this study was a self-developed instrument, to ensure validity and reliability, the researcher incorporated such elements as careful survey design, increasing the size of the survey population, sampling only subject matter experts in the field, ensuring panelists fully understood meanings and terms, using the Delphi technique to avoid potential domination of the participants by one forceful personality, close repetition of the ERAU study design to allow for reliable and valid results. A more detailed analysis of the research methodology and instrument is provided in the following sections.

The ERAU study. The principal basis of this qualitative, case study was a study conducted by faculty members of Embry-Riddle Aeronautical University (ERAU) in 2008 and later published by Ramsay, Cutrer, and Raffel in the peer-reviewed *Homeland Security Affairs Journal* in May 2010. In order to understand the intent and methodology of this current study, it is necessary to provide a synopsis of that earlier study which is being used as a model. The ERAU study determined that a need existed for a set of standardized learning outcomes for a homeland security degree program. In conducting their study, the ERAU researchers selected eight professionals in the field of HS, including the areas of emergency management, homeland security law and policy, terrorism studies, critical infrastructure and risk analysis, law enforcement, and homeland defense. Together, the eight panelists selected for this earlier study had 120 years of

combined experience in homeland security and were considered subject matter experts (SMEs) in their field (Ramsay et al., 2010).

Faculty in the Homeland Security program at ERAU decided to build their undergraduate curriculum by drawing on experience of subject matter experts in the homeland security/defense field, using these SMEs to form a virtual advisory board to provide insight to the ERAU faculty on what knowledge, skills, and abilities graduates from a baccalaureate program in HS should attain. For the purpose of the ERAU study, the following research questions were addressed: (a) Given the breadth that exists in the practice of homeland security, what would constitute a set of core academic areas that would capture the intellectual core of the field?; (b) What would constitute a set of educational objectives and overall program outcomes; that is, outcomes common to all bachelor's programs in homeland security?; and last, (c) What would constitute a set of outcomes for each core academic area (Ramsay et al., 2010).

In order to answer those questions, the Delphi technique was used. Specifically, the Delphi process proceeded in iterative rounds using a web-based survey to present the curriculum outcomes and to capture each panelist's responses. In a series of two rounds, each with several iterations, the ERAU researchers explained the process and presented the precise obligations for the panel members along with a timeline for completion of the round. During subsequent iterations and rounds, the ERAU researchers provided an update and summary of study progress to the participants (Ramsay et al., 2010).

Round 1 of the ERAU study presented a starter set of educational objectives and core academic areas of homeland security. Consensus on the educational objectives, core areas, and definitions for each core area was derived through a series of iterations in this

round. Round 2 presented a starter set of overall program outcomes and a sample set of outcomes for each core area, which were derived in Round 1. Consensus, defined by 75% agreement among the eight panelists, on both sets of outcomes was derived through a series of iterations. As a result of the ERAU study, the panel members identified by consensus three separate sets of outcomes. First, the panel identified three broad, overarching educational objectives (EO's); next the panel identified eight overall (general) program-level outcomes (GO's), and lastly, the panel identified eight core academic areas (CA) within the academic discipline of homeland security (Ramsay et al., 2010). These study results are further depicted in Tables 3, 4, and 5.

As defined in the ERAU study, educational objectives (EOs) are statements that describe the career and professional accomplishments that the program is preparing its students to achieve and are based on the needs of the constituents. These are typically exemplified by graduates 5-10 years after graduation. Table 3 shows the three educational objectives derived from the early ERAU study.

Table 3

ERAU Study - Educational Objectives for a BS in HS

Objective	Description
EO1	Instill in our graduates skills, knowledge and abilities appropriate to the profession of homeland security
EO2	Infuse each graduate with a desire to be a lifelong learner and to pursue subsequent degrees or other professional certifications appropriate to the profession of homeland security
EO3	Instill an appreciation of one's civic duties and responsibilities to society

Note. From *Developing and validating an outcomes-based undergraduate curriculum in homeland security.* (Ramsay et al., 2010).

In the ERAU study, general or overall program outcomes are those KSAs that all graduates of the homeland security degree program should achieve, but are not tied to a specific academic area. In other words, overall program-level outcomes (OAs) are what HS program faculty intend students to be able to know, do, and think (attitudinal) when the students have completed the given educational program. (Note, the eight general outcomes from the ERAU study were modified slightly in the current study to reflect the most current input the researcher was able to solicit from various HS professionals, both in the professional and academic field of HS, and from student surveys conducted by the researcher on HS majors at ERAU. They were then presented as eight Overarching Program Outcomes (OPOs) to the UAPI panelists in the current study). Table 4 lists the eight overall outcomes published in the ERAU study (Ramsay et al., 2010).

Table 4

ERAU Study - General Program Outcomes for a BS in HS

Objective	Description
GO1	Apply homeland security concepts in a non-academic setting through an internship, cooperative, or supervised experience to include real-world experiences, strategies, and objectives.
GO2	Gain an understanding of professional ethics and how they apply in the field of homeland security.
GO3	Demonstrate the capability to utilize and evaluate analytical data applicable to homeland security.
GO4	Demonstrate the ability to conduct research, compose a research paper, and deliver professional presentations and briefings in order to develop and refine analytical abilities.
GO5	Identify, describe, and critically evaluate applicable homeland security technologies.

Objective	Description
GO6	Ability to demonstrate effective communication; especially in ways applicable to homeland security (e.g., policy analysis, briefings, strategic or risk communications, etc.).
GO7	Demonstrate the ability to work in teams.
GO8	Demonstrate the knowledge of contemporary or emergent threats, challenges, or issues in homeland security.

Note. From *Developing and validating an outcomes-based undergraduate curriculum in homeland security*. (Ramsay et al., 2010).

Ramsay et al. (2010) went on to define core academic areas (CAs) as those major functional areas of homeland security that correspond to an extant academic discipline. CAs were confirmed via consensus during the Delphi process and associated outcomes were developed for each. (Note: these original eight core academic areas from the ERAU study were modified by the addition of two core academic areas CAAs (HS Technology and Transportation Security) by this researcher based on feedback from two years of discussions with various HS academics and professionals, and from input gathered via informal student surveys. A revised list of ten CAAs was then presented to the participants in this researcher's current study). Table 5 summarizes the eight original core academic areas which were published in the ERAU study by Ramsay, Cutrer, and Raffel (2010).

Table 5

ERAU Study - Core Academic Areas / Outcomes for a BS in HS

Area	Description	Associated Student Learning Outcome
CA1	Intelligence - A systematic process of collection, analysis, and dissemination of information in support of national, state, and/or local policy or strategy.	(1). The intelligence and counter-intelligence concepts, to include the collection, analysis, and dissemination of intelligence data both within the U.S. and internationally.

Area	Description	Associated Student Learning Outcome
		(2). The organization and mission of the federal Intelligence Community, state and local intelligence agencies within the U.S., private/corporate sector intelligence efforts, and selected global components. (3). Synthesize fundamental intelligence concepts while understanding their variables, limitations, and shortcomings.
CA2	Law & Policy - Legal and policy formulations that provide the basic direction of homeland security means and objectives and establish a context for homeland security within the broader purview of national security.	(4). Legal and constitutional principles and their application in the area of Homeland or National Security law and policy. (5). Case law, precedential, and court decisions relating to and having an effect upon homeland security policy and law.
CA3	Emergency Management - The process of coordinating available resources to deal with emergencies effectively, thereby saving lives, avoiding injury or illness, and minimizing economic losses.	(6). Emergency management and response concepts, phases, and procedures across the range of homeland security challenges. (7). Entry-level emergency operations, training and exercises, to include all levels of exercises.
CA4	Risk Analysis - A systematic method of identifying the assets (e.g., critical infrastructure and key resources) of a system, the threats (i.e., strategic, political, economic, technological, or cultural) to those assets, and the vulnerability of the system to those threats in such a way as to be able to quantify threats and their consequences to a system.	(8). Risk analysis principles, processes, and techniques, in both the public and private sectors. This includes knowledge of an all hazards approach to risk analysis and infrastructure protection. (9). Threat, vulnerability, consequence, and critical infrastructure analysis. (10). Basic industrial (physical) security principles.
CA5	Critical Infrastructure - Systems and assets, whether physical or	(11). The evolution and basic principles of critical infrastructure, in both the

Area	Description	Associated Student Learning Outcome
	virtual, so vital to the United States that the incapacity or destruction of such systems and assets would have a debilitating impact on security, national economic security, national public health or safety, or any combination of these assets.	private and public sectors vital to their community, state or the nation. (12). Identify critical infrastructure and key assets, and apply appropriate counter measures using a risk-based methodology. (13). Compare and contrast private sector and governmental responsibilities in the area of critical infrastructure/key asset identification and protection.
CA6	Strategic Planning - the process of defining an organization's strategy (a long term plan of action designed to achieve a particular goal/objective) or direction and making decisions on allocating its resources to pursue this strategy, including its capital, technology and human resources.	(14). Applicable national strategies and plans, including their history, inter-relationships, similarities and differences. 15). The strategic planning interface between national, state, and local governments. (16). Basic principles underlying strategic planning, and identify these principles as they apply to the national strategy for homeland security.
CA7	Terrorism - The threat of violence, individual acts of violence, or a campaign of violence designed primarily to instill fear. Terrorism is violence for effect: not only and sometimes not at all for the effect on the victims of the terrorists' cause. Fear is the intended effect, not the by-product of terrorism.	(17). The history and basic concepts of global terrorism to include groups, ideologies, and underlying causes. (18). Specific types of terrorism (e.g., state-supported, transnational, domestic, international) including their similarities and differences. (19). The conceptual aspects of counter-terrorism, counter-terrorist activities, and outcomes and be able to identify and describe examples of these concepts.
CA8	Environmental Security - a process for effectively responding to changing	(20). Basic environmental health principles to include: geochemical cycling, population dynamics, aspects of

Area	Description	Associated Student Learning Outcome
	environmental conditions that have the potential to destabilize the political economy or governmental infrastructure of a nation or region which reduces peace and stability and thereby affects U.S. national security.	air, water and land use, food production, environmental economics, and the human impact on the environment. (21). Destabilizing influences and potential security implications from anthropogenic causes, climate change, natural disasters, and hazards.

Note. From *Developing and validating an outcomes-based undergraduate curriculum in homeland security.* (Ramsay et al., 2010).

While the results of the original ERAU study (and other recent papers) were interesting as a first look into the development of an in-depth, outcomes-based curriculum in homeland security, this researcher felt that the size of the survey population was too small to achieve statistical validity, and that further study was warranted to fully explore the issue. Therefore, this current study closely examined the results of the ERAU research and attempted to validate and expand upon the earlier results utilizing the same research methodology, but performed on a much larger survey population, and including an additional set of survey questions employing a 5-point Likert scale.

Data Collection, Processing, and Analysis

This section is a review of the research model and of the activities employed for each of the Delphi rounds in this researcher's current project. The researcher delivered an online, iterative survey to the full membership of UAPI (N = 338), all experts in the field of academic homeland security, to solicit their consensus on overall program outcomes, and core academic areas for an academic undergraduate degree in HS. Unlike the earlier ERAU study being used as an exemplar, this current research project did not attempt to identify educational objectives, as it was felt by the researcher that these elements had been sufficiently well developed and that more emphasis should be placed

on program-level outcomes during this research project. Instead, it was decided to condense the term educational objectives into what this researcher called overarching program objectives (OPOs), which capture essential outcomes a student must master but which do not fall conveniently under the program-specific outcomes.

The survey instrument for this study was the Delphi technique adapted to an on-line format using a commercial software program called *SurveyMonkey®*, which is one of the world's leading providers of web-based survey solutions. This software program allowed the researcher to design and conduct multiple surveys while storing the data on a secure sockets layer (SSL) encrypted server. The surveys were only accessible by the researcher via a unique user name and password, ensuring that user data was safe, secure, and available only to authorized persons. Besides stringent security, *SurveyMonkey®* software offered the researcher the ability to analyze and display collected data in a variety of formats and perform quantitative textual analysis on open-ended responses. Key to Delphi methodology, the use of this software program enabled the survey respondents to maintain their anonymity while allowing the researcher to collect, compile, and resubmit the data from each iteration for overall consensus. This was accomplished using the internet protocol (IP) address masking feature in the software which hides the respondents e-mail address from the researcher (SurveyMonkey®, n.d.).

Appendix C depicts the survey instrument containing the questions that were asked in Round 1 of the Delphi process. The questions in this first round dealt with the proposed core academic areas of an HS degree as initially identified by the ERAU study (Ramsay et al., 2010). Appendix D depicts the survey instrument that posed the questions in Round 2 of the Delphi process, and this round focused on the overarching

program objectives. The third round focused on identifying program specific objectives associated with the core academic areas identified in Round 1. Appendix E lists the survey instrument used to obtain the data for the program specific objectives, while Appendix F lists the set of questions designed to collect demographic information from the Delphi panelists and to survey their thoughts on specific elements of an academic HS program. The survey instruments and processes used are explained in greater detail in subsequent paragraphs.

To cost effectively address the above questions using a panel of experts (the UAPI membership) from around the country, the Delphi technique was adapted to an online format using a secure, commercial software product (*SurveyMonkey*®) that employs an secure, web-based survey. Panel responses were entered directly in the on-line survey forms and the completed surveys were electronically and securely submitted to the researcher for review, evaluation, and resubmittal to the panel in subsequent iterations.

The Delphi technique presumes each panelist will proceed from a common platform and common vocabulary (Linstone & Turnoff, 2002). Homeland security is an objectively broad field. Hence, the researcher could not assume that each panelist will proceed from a common definition of homeland security, something essential to the ability to derive consensus on outcomes that comprise the discipline. Therefore, for the purposes of this study, certain terms were defined or explained to the panelist members for sake of standardization, but not to influence the panelist's opinions.

Theoretically, the Delphi process can be continuously iterated until 100% consensus is determined to have been achieved. However, Ludwig (1997) and Custer, Scarcella, and Stewart (1999) pointed out that three iterations are often sufficient to

collect the needed data to reach a consensus in most cases. The number of Delphi iterations (rounds) in any study depend largely on the degree of consensus sought by the researcher and can vary from three to five (Ludwig, 1997). Based on work done by Tieglaar, Dolmans, Wolfhagen, and Van der Vleuten (2004), consensus was defined in this particular study as the point in any round when 75% of the panelists agreed on a particular item. Agreement was defined as the point at which no further discussions are entered by the panelists on a specific issue, and at least 75% of the panel members select the *keep as written* box on each element under discussion.

The following discussion, taken from Hsu and Sanford (2007) provides generic guidelines on a typical 4-round Delphi process:

> *Round 1*: Many Delphi studies begin with an open-ended questionnaire, which serves as the cornerstone for data gathering about a specific content area. After receiving the panelist's responses, the researcher then constructs a well-structured questionnaire. However, it is both an acceptable and a common modification of the Delphi process to use a structured questionnaire in Round 1.
>
> *Round 2*: Here, each Delphi participant receives a second questionnaire and is asked to review the items summarized by the researcher based on information provided in the first round. Accordingly, Delphi participants may be asked to rate items to establish preliminary priorities among items. As a result of Round 2, areas of disagreement and agreement are identified, and consensus begins.
>
> *Round 3*: Next, each participant receives a questionnaire that includes items and ratings summarized by the investigator in the previous rounds and are asked to revise his/her judgments or to specify reasons for remaining outside the

consensus. This round gives Delphi panelists an opportunity to make further clarifications on the relevance and importance of their input. Often three rounds are sufficient to reach consensus in the Delphi technique.

Round 4 (if needed): During this optional round, the list of remaining items, their ratings, minority opinions, and items achieving consensus are distributed to the panelists. This round provides a final opportunity for panelists to revise their judgments. (pp. 2-3)

Specifically, the Delphi process used in this research study consisted of the following four steps (rounds):

1. Iteratively develop a consensus on what should constitute a set of core academic areas (CAAs), and definitions for those areas, that represent broad practice areas in homeland security.
2. Iteratively develop a consensus on what should constitute a broad set of overarching program objectives (OPOs) for a bachelor's degree in HS.
3. Develop through consensus, the program specific objectives (PSOs) that will accompany the CAAs developed earlier and serve as guidelines for the suggested content in each course.
4. Using a survey, collect demographic data regarding the study participants and gain insight into the participants' ideas regarding specific issues in HS education.

The first step in the Delphi process was the development of the research question, which was based on the researcher's experience and interest in the area of homeland security curriculum development. An initial literature review was conducted (see Chapter 2) which determined that further study of the subject of HS curriculum

development was warranted. After the research questions were developed, the qualitative case study methodology was chosen as a research instrument, along with the Delphi technique, to examine and expand upon the earlier study conducted by Ramsay et al. (2010). Selection of the survey participants was accomplished using a convenience, purposive sampling method made up of the full membership of the UAPI.

As discussed in previous sections, this Web-based research project used case study methodology to examine a previous study on HS curriculum development. This study followed a Delphi heuristic model that is qualitative in nature. Specifically, the Delphi methodology proceeded in iterative rounds using an on-line, secure survey to present the elements under investigation and to capture each panelist's responses. Once a prospective panelist agreed to participate, they were provided a secure link to access each round of the on-line survey. The survey itself resided on a secure server maintained by the software company *SurveyMonkey*®, and all data collected was maintained in a password protected file on the researcher's password-protected computer and was not shared with any other individuals except in standardized, anonymous reports. Figure 1 depicts the elements of the four-round Delphi process used in this study. Each step of the process will be further explained in the following paragraphs.

Prior to beginning data collection, the researcher obtained approval from the Northcentral University Institutional Review Board (IRB) (see Appendix A). For the actual study, the first step consisted of e-mailing an introductory letter to each prospective panelist, outlining the purpose of the study and informing them of the procedures to be used (see Appendix B). One week after sending out the introductory

letter, the first survey instrument, Round 1, was electronically sent to each panelist (see Appendix C).

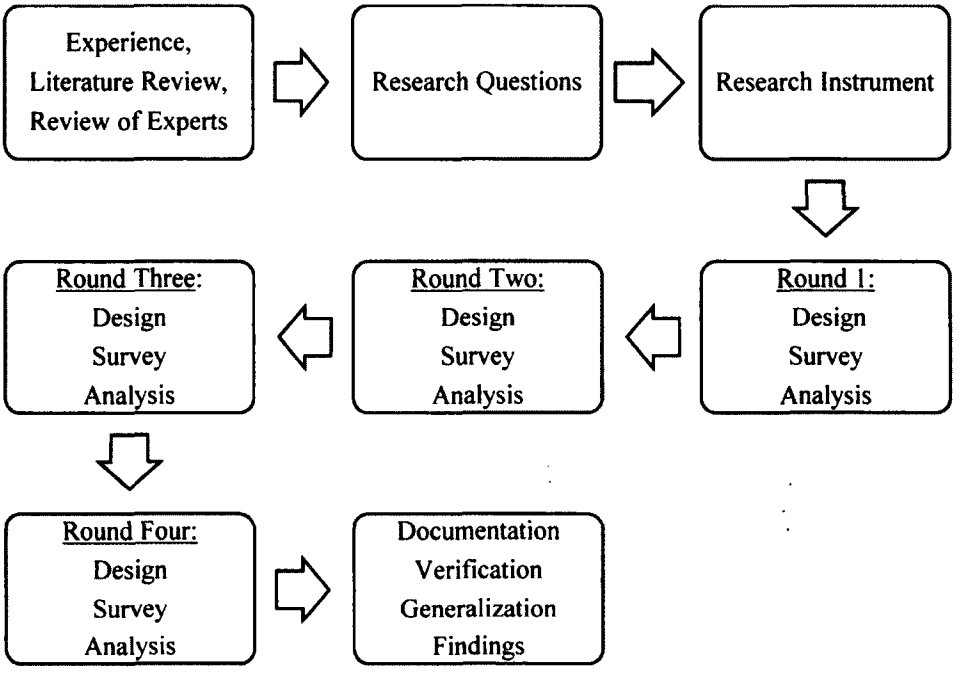

Figure 1. Flowchart of the Delphi process methodology.

The questions in Round 1 were designed to elicit opinions from the panel of experts on what elements should comprise the core academic areas (CAAs) of an undergraduate degree program in homeland security. For purposes of this study, the researcher defined CAAs as the major functional homeland security areas which correspond to an extant academic discipline. Basically, the "building blocks" of an HS curriculum, these academic areas serve to specify and describe major topics of study that the degree program should cover.

Round 1 surveyed the panel as to their opinions using the similar questions posed by the original ERAU study, but presented to a larger potential population (N = 338). Three choices existed for each CAA posited in this round of the survey: (a) *keep as*

written, (b) *keep with edits*, or (c) *delete*. If option (b) was chosen, a comment box was provided to add user edits. If a majority of panelists (determined to be 75% for this study) selected *delete* for a specific element of the round, that element was judged inappropriate for the study and was discarded from the proposed curriculum. Similarly, if 75% of the responses for a particular item have *keep with no editing*, that element was deemed fully acceptable by the panel, excluded from subsequent iterations, and included in the proposed curriculum. Responses where 75% of the panelists selected *keep with edits* were closely scrutinized, and the using the text analysis feature of *SurveyMonkey®*, these recommendations were collated, compared, and synthesized (with duplicate entries deleted) into a revision of the particular element. Any such revised element was tagged on the next iteration for that round so that the panelists could agree or disagree with the researcher's compilation of the suggestions supplied.

In an effort to expand upon the initial data presented in the ERAU study, and other more recent studies, two additional Core Academic Areas (CAAs) were added to the original eight offered by the ERAU study (Ramsay et al., 2010). The reasoning behind the addition of these new elements is that the researcher taught homeland security courses for two years following publication of the initial ERAU study, and during this timeframe consulted with a wide variety of HS experts both in academe and in the government/private sector on what was needed in the way of KSAs for a graduate of a bachelor's level homeland security program. Additionally, informal surveys were periodically given to the ERAU homeland security student body during the same period to solicit their desires on type of courses HS they felt should be offered at the university. Knowledge and insight gained by the researcher during this period of curriculum

discovery prompted the addition of two new elements to the CAAs: (CAA # 2 – Technical Systems in HS and CAA # 9 – Transportation Security) to the list presented to the Delphi panel in Round 1.

The justification for adding new elements to the CAAs was twofold: one, an outcomes-based curriculum should be flexible and adaptable to changes in a particular field of study, especially one as fluid as homeland security. Andrich (2002) posited that an outcomes-based education program must describe actual student learning experiences that can be assessed in light of measurable performance metrics. Similarly, Killen (2000) defined the essence of an outcomes-based education (OBE) as ". . . clearly focuses on organizing everything in an educational system around what is essential for all students to be able to accomplish successfully at the end of their learning experiences" (p. 2). Secondly, since the field of homeland security is both complex and dynamic, presenting an enhanced list of CAAs to the larger survey population of the UAPI membership warranted an up-to-date list of those elements that the HS field saw as important in today's environment, not a list of CAAs based on data that was three or four years old. A study in the *Journal of Homeland Security* emphasized that concept with the following quote, "America needs not only to train existing homeland security personnel, but also to educate the next generation of people charged with protecting the United States from terrorist threats" (Altizer et al., 2006, p. 1). That type of education for the next generation of homeland security practitioners can only be accomplished through careful development of a curriculum that is pedagogically sound and yet flexible enough to respond to dynamic changes in the field. Both students of HS and HS professionals

suggested the addition of two new CAAs to the original ones posted in the ERAU study. Hence, the addition of two additional core academic areas to this study.

A total of three iterations were employed in Round 1. From to potential list of 338 UAPI members, the number of panelist's responding for Round 1 was 62, 49, and 46, respectively for each iteration in that round, making an average response count for Round 1 of 52 participants. Of the original 10 CAAS from the model ERAU study (Ramsay et al., 2010) that were submitted for consideration, the list was iteratively reduced using the Delphi technique from a high of 40 to a final count of 15 CAAs, which was deemed acceptable and manageable number by the panelists for inclusion into an HS curriculum. Panelists were given the opportunity to verify that Round 1 responses did reflect their anonymous opinions by voting on the revised elements before moving on to Round 2. Iterations were continued in Round 1 until 75% of the panelists agreed with the concept and the wording of each element retained, or the total number of three iterations was reached. Again, consensus on a particular round was considered to be achieved when 75% of the panel members agree with the proposed academic areas presented by selecting the *keep as written* box on the survey form for each element.

Obviously, Round 1 responses were the basis with which to develop the associated program specific objectives (PSOs) in Round 3. However, it was decided to move to identification of the OPOs in Round 2, in order to prevent any duplication of effort in the subsequent round to develop the program specific objectives (PSOs). Overarching program objectives refer to critical outcomes that do not necessarily or conveniently fall under an extant core academic area. They represent learning outcomes that can be accomplished by general education requirements of the university and hence

do not necessarily need to be taught by the homeland security programs. Program specific objectives (PSOs) were defined in this study as traits, skills, abilities, and behaviors desired by constituents; they must be able to measure the capabilities of the student and the program; they should be designed by the constituents and the academic program to cover major program components; they should be based on constituent/program consensus of needs and how to satisfy those needs; they must be able to be customized by each academic program as required; and they must be looped for periodic review and continuous quality improvement.

In the second round, panelists were asked to consider and evaluate overarching program objectives that should be included in an HS curriculum. OPOs are defined for this study as general education requirements - something that all HS students should be able to accomplish or demonstrate. Round 2 was an important round in that it established a basic set of OPOs, and in an effort to avoid duplication with later PSOs, the researcher decided to extend the round to five iterations, in order to achieve the desired 75% level of consensus on all eight of the OPOs presented. In the five iterations for Round 2, the participant's response count was 39, 36, 39, 39, and 32, respectively, making an average response count of 37 panelists for that round.

Round 3 of the study asked the panelists to agree upon a set of program-specific objectives for each of the CAAs derived during Round 1 of the study. As in earlier rounds, panelists had the opportunity to keep an element as written, keep an element with edits, or to delete an element. The same criterion for consensus (75% of the panelists in agreement) was used to declare that agreement had been reached on a specific element in that round. Round 3 of the research study employed three iterations to focus on the

program specific objectives (PSOs) that would be directly associated with each of the 15 CAAs derived from Round 1. A similar methodology was used in this round, asking the participants to *keep as written*, *keep with edits*, or delete each of the individual PSOs presented. This researcher decided that since the list of CAAs from Round 1 was rather extensive – 15 in total – that there must be some practical limit set on the number of proposed PSOs to be associated with the core academic areas. With a survey population of approximately 40 respondents, each having the opportunity to submit his/her own particular PSOs, the number could grow out of hand quickly. Hence, the study was designed to offer a total of three proposed PSOs per CAA, making the initial offering 45. The 45 PSOs submitted to the panelists in the first iteration of Round 3 were derived from a variety of sources, primarily the ERAU study (Ramsay et al., 2010), but also from a study of curricula from other institutions of higher learning offering HS degrees. There were three iterations in Round 3, and the response count for each of the iterations was 36, 33, and 32 respectively, making an average response count for Round 3 of 34 participants. The final result of Round 3 was consensus on 50 PSOs to accompany the 15 CAAs from the first round.

Lastly, Round 4 was designed as a list of culminating questions, serving as both a set of demographic data about the participants, and a measure of the panelist's opinions regarding a variety of issues regarding academic homeland security. An average of 33 participants responded to the questions in Round 4. This round consisted of a Likert-scale survey which is depicted in Appendix F. The demographic-type survey questions at the beginning of Round 4's survey served to establish data about the survey population, while the remainder of the questions related to HS-specific curriculum development

topics. The first nine questions in Round 4 pertained to demographic data, and have varying answers. The next questions (10-33), employ a common 5-point Likert scale, with the choices ranging from: (a) *strongly disagree*, (b) *disagree*, (c) *neither agree or disagree*, (d) *agree*, or (e) *strongly agree* with the questions or statements posed. Unlike previous rounds that used the iterative Delphi technique, Round 4 had only one iteration, and the data obtained in this final round was analyzed using appropriate nonparametric tests. The last three questions (34-36) asked the participants to rank order select academic topic areas that might comprise an Associates', Bachelor's, and Master's degree in HS, respectively.

The Likert-scale used in Round 4's survey, also called a summative scale, was developed by Rensis Likert in 1932, and it requires the individuals to make a decision on their level of agreement, generally on a five-point scale (i.e., Strongly Agree, Agree, Neither Agree or Disagree, Disagree, Strongly Disagree) with a statement. The number beside each response becomes the value for that response and the total score is obtained by adding the values for each response (Page-Bucci, 2003). Maurer and Andrews (2000) suggested the Likert scale can be considered a measure of both magnitude and confidence, and they concluded, based on reliability, predictive validity, and factor analysis data, that a Likert scale measure of self-efficacy is an acceptable alternative to the traditional quantitative measure.

Debate continues among researchers about whether Likert scale data is ordinal or not and should be tested using parametric or nonparametric methodology (Clason & Dormody, 1994; Kislenko & Grevholm, 2008). According to (Mogey, 1999), once the data is obtained in a survey, Likert scale ordinal data can be analyzed using an

appropriate nonparametric test, either a descriptive technique or an inferential technique. For the purposes of this study, the data obtained from the Round 4, 5-point Likert-scale survey was treated as ordinal data and was collated as such, using the non-parametric test of central tendency summarized by the mean. The intended purpose of Round 4 was to poll the panelists on their opinions regarding a wide range of academic HS topics in hopes of establishing a baseline of what a purposive, convenience sampling of subject matter experts feel is important to have in a HS curriculum. (The results from the survey are discussed in detail in Chapter 4).

Finally, all of the data collected was used it to verify the results of the original ERAU study by Ramsay, Cutrer, and Raffel (2010) and to determine the extent to which the results can be generalized. According to Yin (2003), generalizability in a qualitative case study is an elusive concept and must be approached from the standpoint of analytical versus statistical generalization. In other words, when conducting case study analysis, the results can be compared to an overarching theory or proposition. In this study, generalization was achieved by the fact that the research results were able to be related to any institution of higher learning that wishes to offer a degree program in homeland security. Hopefully the results from this researcher's study can be synthesized into a set of core academic areas, overarching program objectives, and program-specific objectives, tied to precepts of outcomes-based education, which can comprise the elements of a standardized HS curriculum.

Methodological Assumptions, Limitations, and Delimitations

Both reliability and validity were concerns during this study. Since this research project is a follow-up to the initial study done by Ramsay et al. (2010), the assumption

was made that the methodology used in that first study by ERAU was valid. This assumption was made by virtue of the exhaustive literature review conducted in Chapter 2 on the merits and methodology of the Delphi process, to which the ERAU study clearly conformed. According to Gay and Airasian (2000), "reliability is the degree to which a test consistently measures whatever it is measuring" (p. 169). Another definition provided by Sekaran (2003) states, "Reliability refers to the consistency and stability of the measurement instrument and means freedom from random error" (p. 422). (To ensure reliability, the survey instruments used during the 2008 ERAU study were replicated closely in the hopes of soliciting consistent responses from the UAPI panelists). Validity is defined by Shank (2006) as "the notion that what you say you have observed is, in fact, what really happened" (p. 111). While the methodology of the ERAU study was judged as being sound, this study confirmed the earlier study's validity, in that the elements of an undergraduate degree in homeland security that were developed are, in fact, the KSAs that another sample of HS practitioners would really want a recent graduate to possess. Hence, one of the outcomes of this study was to validate the earlier ERAU study among a larger survey population of UAPI members. Using similar research protocol (Delphi technique, on-line survey, and consensus-building regarding curriculum outcomes), this researcher's current study achieved a solid degree of validity and reliability.

As in any research study, this one had limitations and delimitations. The population of SMEs not surveyed delimited the research project. A limiting factor is the sheer number of HS practitioners in this country and abroad. Because of this, a survey could not be sent to every homeland security professional responsible for determining

what skills, knowledge, and abilities were required of newly hired personnel. The numbers involved would be beyond the practical scope of work for the researcher due to financial and time constraints. Hence, the decision to utilize a two-pronged approach of intently studying what select earlier studies already accomplished and using the results of those studies as a springboard to survey a larger population to determine comprehensive program-level outcomes for an HS curriculum. The larger survey population of UAPI members (338 potential members) helped to validate the first study's research methodology and provided a basis for the comparison study for this follow-on study.

Another limitation was the use of the Delphi technique itself. The basic methodology of a Delphi panel requires iteration and consensus over a sustained period of time (Linstone & Turnoff, 2002). While this extended time period can actually assist the researched in synthesizing the iterative results between each round, the time involved can become a limiting factor to the panel participants. Therefore, the consensus development process can be sufficiently lengthy as to result in attrition and unresponsiveness of members due to normal work related factors.

All studies present a researcher with inherent limitations. This study faced the limitations of sampling size. Even though this study initially sampled a much larger population than the initial studies it was modeled after, it was not a random sampling, but more of a convenience sampling, since the population surveyed consisted of the members belonging to a specific professional HS organization. However, the larger population provided a greater cross-section of background, experience, and beliefs, which helped ensure the overall validity of the study.

A final delimitation imposed on this study was the usual lack of time and resources that a single researcher faces while engaged in a doctoral dissertation program. Because this researcher faced those same restrictions during the project, the size of the survey population was limited to the members of UAPI, and no attempt was made to encompass the vast field of HS professionals in the workplace and in academia today. Additionally, a time constraint was imposed by the researcher between successive iterations and rounds in order to complete the study in an appropriate amount of time.

Ethical Assurances

When research involves human subjects, ethical issues may arise. This research project was a case study approach to confirm and validate the earlier studies on HS curriculum development, particularly the ERAU study (Ramsay et al., 2010). This project expanded upon those earlier studies and surveyed a larger population of homeland security experts to validate that research using a perception survey with participants from UAPI member institutions and agencies as de facto SMEs in HS curriculum development.

As with any research that involves human subjects, even a study as simple and straightforward as this one that employs only an on-line survey to reach consensus on issues, there existed a need to ensure honesty, trust, and respect during research to safeguard the rights of the participants. Typically, there are four categories of ethical issues in research including protection from harm, informed consent, right to privacy, and honesty with professional colleagues. Therefore, formal written approval from Northcentral University's Institutional Review Board (IRB) was sought and obtained prior to any data collection or participant involvement (see Appendix A). In this study,

primary data extraction from human subjects occurred only in the Delphi process in the form of a written survey. This on-line survey was conducted electronically, under informed consent, anonymously, and confidentially with the reporting of results in subsequent rounds as aggregated interpretations of what was individually submitted. Following the precept of the Delphi technique, the panel participants did not have any form of personal interaction, and their individual anonymity and responses were guarded. The iterative expression of professional opinions drove the data collection. All data was collected using the commercial software program called *SurveyMonkey*®, which uses secure servers and issues each survey participant a unique, encrypted link to access the survey instrument. Only the researcher saw each panelist's input during rounds, and that feedback was anonymous – not tied to any particular user. Lastly, all data was stored on the researcher's password-protected computer kept in a locked office at all times. No other person had access to the participant's personal data during the project.

Throughout the study, this researcher strove to maintain respect for the panel members by ensuring their dignity and well-being were preserved and protected. The Delphi panel members in the study were chosen because of their knowledge, reputation, and experience in the field of homeland security, and as such, respect was afforded each member. The researcher was fully aware of the responsibility to minimize risks of harm or discomfort to the members participating in the study. Because the primary means of interaction between researcher and subject in this project was in the form of secure e-mails, there were no physical risks associated with this study. Anonymity was maintained throughout the study, and the Delphi panel members had no opportunity to

interact directly, thereby reducing the perception of influence or application of peer pressure between members.

As stated previously, the members selected for participation in this study comprised a Delphi panel, and each panelist was chosen from the ranks of homeland security professionals that had significant knowledge and experience in the field. In order to guarantee a fair and equitable distribution of the potential benefits and burdens associated with this study, the researcher ensured that each panel member was asked to perform exactly the same duties

Per the requirements of 45 CFR 46.116, there are eight basic elements of informed consent that must be provided to each subject:

1. A statement that the study involves research, an explanation of the purposes of the research and the expected duration of the subject's participation, and a description of the procedures to be followed;
2. A description of any reasonably foreseeable risks or discomforts to the subject;
3. A description of any benefits to the subject or to others, which may reasonably be expected from the research;
4. A disclosure of appropriate alternative procedures or courses of treatment, if any, that might be advantageous to the subject;
5. A statement describing the extent, if any, to which confidentiality of records identifying the subject will be maintained;
6. For research involving more than minimal risk, an explanation as to whether any compensation and an explanation as to whether any medical treatments are available if injury occurs and, if so, what they consist of;

7. An explanation of whom to contact for answers to pertinent questions about the research and research subjects' rights, and whom to contact in the event of a research-related injury to the subject; and

8. A statement that participation is voluntary, refusal to participate will involve no penalty or loss of benefits to which the subject is otherwise entitled, and the subject may discontinue participation at any time without penalty. (DHHS, 2007, p. 15)

These eight elements, as applicable, were each addressed in an introductory e-mail that was sent to each participant selected to serve on the Delphi panel for this research study into the development of an undergraduate homeland security degree curriculum.

As part of the informed consent form, contained in Appendix B, a description of potential risks and benefits of this study was provided to each participant. The risks for participating were judged to be minimal, since the only interaction between the researcher and the panel members was be via electronic surveys and e-mails; the benefits of gathering data and expert input to assist in designing an outcomes-based undergraduate curriculum for a homeland security degree was significant. To this researcher's knowledge, this is one of the first such studies of such complexity and scope undertaken in the relatively new field of academic homeland security, and one desired outcome of the research was to posit a set of curriculum standards that any university can use to aid in development of an HS degree program, and ultimately lead to national accreditation. All of this was enumerated in detail to each panel member via the introductory e-mail.

Competency for purpose of this study was defined as a select group of senior officials who can help achieve consensus on what the profession is looking for in a

university graduate with an undergraduate degree in homeland security. This study was conducted to validate the earlier ERAU study (Ramsay et al., 2010) and to compare those results to other recent studies regarding HS curriculum development such as Bradshaw, 2011; France, 2012; Ramirez & Rioux, 2012, and Winegar, 2008. Armed with the data from these studies, the researcher refined the survey tool and distributed it to a larger survey population, envisioned to be the participating partners of the UAPI membership in the spring of 2010, which equated to a potential survey population of 338 individuals. (In actuality, an average of 40 participants responded during each of the four rounds). While this is still not a random sample population, it represented a much larger sample size of select experts, and helped to improve reliability, validity, and creditability of the study.

Summary

An ancient Chinese military strategist, Sun Tzu, is quoted to have said in the sixth century BC, "Know your enemy, and know yourself" (Sawyer, 1994, p. 41). In the post-9/11 global war on terrorism, the homeland security professional would do well to heed those words. It has been argued that education is one of the key elements in the nation's war against terrorism (Rosberg & Bonn, 2004). If homeland security is understood to be the protection of the U.S. peoples against extreme, unanticipated threats, it becomes apparent that the design of an educational curriculum in HS should be broad, multi-disciplinary, and able to evolve as the field does (NRC, 2006). It is this researcher's opinion that a curriculum using outcomes-based education is the key to success for the next generation of homeland security professionals. Pelfrey and Pelfrey (2009) affirmed that "the gathering of information on the efficacy of courses and the degree to which the courses form a curriculum is at the heart of academic evaluation" (p. 59). This

qualitative study employed the Delphi technique, using a survey population of HS SMEs, as a means to answer that educational challenge by deriving a set of core academic areas (with definitions) that will comprise an intellectual core for the emergent discipline of homeland security. Hence, the purpose of the study was twofold. First, the study attempted to develop and vet a set of program outcomes for an undergraduate curriculum in the field of academic homeland security. This phase was accomplished using the Delphi methodology in on-line, iterative rounds to achieve a 75% consensus among participants as to the makeup of the program outcomes of an undergraduate HS degree. Second, the study utilized a 5-point Likert scale survey of the same participants to assess their opinion on a variety of HS curriculum issues to gain a perspective as to how the field of subject matter experts felt about the field of academic homeland security in general. It is anticipated that this study will build upon the earlier work of Bradshaw (2011), France (2012), Polson et al. (2010), and Ramsay et al. (2010) in the development of a standardized homeland security degree program.

Moreover, this study produced a comprehensive set of program specific outcomes for each core academic area in homeland security studies. This was accomplished using an on-line Delphi technique and a secure web portal to receive respondent submissions. The results demonstrated that it is possible to develop a face valid set of core academic areas (CAAs) by which the field of academic homeland security might be defined. In addition, the study produced a rational set of program specific outcomes (PSOs) that can drive and guide the formation of an undergraduate program in homeland security. This study revealed a clear need for an external professional association that will develop, vet, and maintain a widely accepted set of core academic areas and program specific

outcomes on which to base HS accreditation efforts. Were such an organization to arise and become recognized by either the Council for Higher Education Accreditation (CHEA) or the U.S. Department of Education as a special accreditor of homeland security programs, the professional sovereignty of academic homeland security would be well served and the needs of its various constituents well met.

Chapter 4: Findings

The purpose of this study was to conduct qualitative research into the lack of generally accepted or peer-reviewed program-level, learning-based outcomes that define an undergraduate degree in homeland security, and to validate and build upon earlier studies conducted on the issue. In one study entitled *The Homeland Security Academic Environment*, Rollins and Rowan (2007) made the following observation: "Based on a review of available data it does not appear that the homeland security academic environment has matured to the point that common core requirements are taught at any level of higher education" (p. 12). Additionally, while the topic of homeland security curricula has been the subject of growing academic debate in recent years, there is no national accrediting body for HS degree programs, such as exists in other academic disciplines, despite the fact that the concept of homeland security continues to find its way into academia. More recent studies into homeland security curricula development by Bradshaw (2011); Forster and Plant (2010); and France (2012), clearly found that there is no general consensus among academe, or for that matter among organizations in the Federal government, as to which subjects should be included in a baccalaureate homeland security degree. In a report called the *Top Ten Challenges Facing the Next Secretary of Homeland Security* (2008), the Homeland Security Advisory Council identified the challenge of building a cadre of homeland security leadership through a unified national system of training and education as being one of the ten key challenges for DHS. Specifically, the report stated, "DHS must lead an effort to align curricula, develop education standards, define loose boundaries of the profession, and support the academic foundation of a homeland security education system" (pp. 9-10). This national

leadership and standardization of homeland security academic curriculum development has not happened to date, and most institutions of higher learning in this country appear to have developed their HS degree programs in a vacuum. According to the *2010 Quadrennial Homeland Security Review Report*, although a significant amount of effort has been expended in creating homeland security education programs around the nation, it remains to be seen whether existing academic programs will adequately meet the needs of the homeland security community (DHS, 2010). A study by Moore et al. (2010) published in the *Homeland Security Affairs Journal* summarized the problem succinctly, "At present there is no general consensus on how a homeland security curriculum should be offered, nor has any accrediting body for such programs come into existence as of this writing" (p.1). That problem is exactly what this current study attempted to address.

Using (a) a Delphi methodology of iterative rounds, (b) a survey population of the University and Agency Partnership Initiative (UAPI) membership, and (c) the ERAU curricula study (Ramsay et al., 2010) as a baseline, this project examined the knowledge, skills, and abilities (KSAs) that a panel of HS subject matter experts (SMEs) deemed appropriate for future homeland security professionals. The purpose of Chapter 4 is to provide details regarding the results of the qualitative study on the development of an outcomes-based undergraduate degree in homeland security, including processing and interpretation of the data collected. The organization of Chapter 4 is built around the three research questions that guided the study, and the chapter is further subdivided sequentially following the steps (rounds and iterations) in the Delphi technique.

Results

A qualitative case study approach that focused on three research questions was employed for this study. In order to address these questions, a four-round Delphi technique was selected as the data collection instrument for the study because that process provided a framework of group consensus and participant anonymity. During the literature review in Chapter 2, it was noted that the Delphi methodology was also chosen as the appropriate research method in several recent studies that sought to ascertain the elements that should make up college curricula (Bradshaw, 2011; Eskandari et al., 2007; France, 2012.

This research project used the commercial software product *SurveyMonkey*® to design an online study that consisted of iterative rounds designed to achieve consensus among the target population of the UAPI membership. UAPI members were seen as SMEs on the topic of academic homeland security based upon their collective wisdom and experience in the field. At the commencement of this study, the UAPI membership numbered 338 individuals from over 200 participating colleges, universities, and government organizations. An introductory e-mail was sent to each of the 338 UAPI members, explaining the purpose of the study and asking members to sign and return an Informed Consent Form if they chose to participate. Of the 338 members in UAPI at that time, a total of 80 initially responded favorably and agreed to participate in the study; however, at the end of the first iteration of Round 1, only 62 members of UAPI had responded. This equates to a 12% rate of return from the UAPI membership, and according to Dennington (2004), is in line with the average rate of response (10-15%) for any online survey.

During subsequent rounds, the number of participants in the study declined slightly, as is customary in the Delphi process, and stabilized at an average of 40 respondents per round for the duration of the 12 iterations of the project. This dropout rate is in line with that of typical Delphi studies, which according to von der Gracht (2008) is usually in the range of 20-30 per cent. According to Adler & Ziglio (1996) and Linstone & Turnoff (1975), an acceptable number of participants for a Delphi study range from 10-30, with an optimum number of 10-20. Although the average number of respondents per round in this study (40) was slightly higher that the optimum suggested above, the researcher decided the benefit of additional feedback outweighed any cost of additional workload of data collection and analysis

In each successive round/iteration, the responses from each participant were qualitatively analyzed. Using the text analysis component of the *SurveyMonkey®* software, written comments from the participants were compared for common elements, compiled into a synthesized response, and any duplicate entries were removed. This allowed the researcher to fuse the responses of the panel for each element, and kept personal bias out of the methodology. This compiling and fusion of data from subject matter experts, who were able to freely voice their opinion with anonymity over a series of rounds, illustrate the power of the Delphi technique (Rowe & Wright, 1999). In this way, the Delphi methodology was used during the study to answer the three research questions discussed in the following sections.

Research Question 1

The first research question posed by this study asked: *What core academic areas (CAAs), overarching program objectives (OPOs), and program specific objectives*

(PSOs) should comprise an undergraduate degree in homeland security. This query was addressed by closely examining and then using text analysis to compile the data from the first three rounds of the study and each round's accompanying iterations. Round 1 used three iterations of the Delphi technique to consensually develop a list of core academic areas for an HS degree. Round 2, which included five iterations, used the same process to have the participants agree upon a list of overarching program objectives that should be included in an HS degree curriculum. Round 3, using three iterations, asked the panelists to arrive at a list of program specific objectives that would accompany each of the core academic areas developed in Round 1. Hence, these three rounds of the Delphi technique, which are discussed in detail in the sections below, comprised the basic methodology to collect data for the purpose of answering research questions 1, 2, and 3.

Round 1. As stated earlier, Round 1 was used to answer the first part of Research Question # 1 regarding core academic areas that should make up an HS curriculum. Before Round 1 was begun, an introductory e-mail was sent to each of the 338 members of UAPI during the spring of 2010. The names and e-mail addresses of the UAPI membership were obtained from the UAPI official website. This introductory e-mail (see Appendix B) included a brief overview of the study's purpose and also contained an electronic Informed Consent Form. The purposive sample survey in Round 1, Iteration 1 was subsequently sent to the 80 individuals, out of the 338 UAPI memberships, that initially agreed to participate in the study by signing and returning the Informed Consent Form (Appendix B). Once panelists agreed to participate, the researcher sent each of them an e-mail with a secure link to the *SurveyMonkey*® website where the survey instrument resided.

Iteration 1. Initially, participants were advised as to the nature of the study and were asked to provide input on the suggested core academic areas (CAAs) from the Ramsay et al. study (2010) (see Appendix C). The participants were told to decide whether each CAA listed should be placed in one of the following three categories: (a) *keep as written*, (b) *keep with edits*, or (c) delete. Lastly, the participants were informed that consensus on a particular element was defined as at least 75% of the participating panelists in agreement with topic and wording. Follow-up emails were sent to non-respondents after two weeks to encourage continued participation in the survey.

A total of 62 participants (out of the 80 that initially agreed to participate) responded to the first iteration of Round 1. Responses were first analyzed to ascertain which, if any, of the 10 suggested CAAs achieved the required 75% level of consensus. Of the original CAAs proposed, only two (CAA # 2, Technical Systems and CAA # 8, Terrorism Studies) achieved the required level of consensus in this first iteration. Those two CAAs were therefore adopted into the list and were not submitted in further iterations. A total of 210 separate comments were provided by the participants for the CAAs presented in this iteration, indicating what edits they wished to see made in the verbiage of the CAAs' description. For the eight remaining CAAs that were selected as *keep with edits*, textual analysis was conducted on the comments provided by the participants, and similar elements were compiled, with duplicate entries deleted, to arrive at a revised list and accompanying descriptions for these CAAs. The *SurveyMonkey*® software offered the ability to analyze and display collected data in a variety of formats and perform quantitative textual analysis on open-ended responses such as the comments (SurveyMonkey®, n.d.). Additionally, participants were asked to submit any new CAAs

that they felt should be included in an undergraduate degree curriculum for homeland security. The response was overwhelming, with a total of 60 new CAAs proposed by the participants. Table 6 depicts the results from Round 1, Iteration 1.

Table 6

Round 1, Iteration 1 Results: Consensus on Original CAAs

CAAs from ERAU Study (N=62)	% Keep as Written	% Keep with Edits	% Delete	# of Comments
1. Intelligence Studies	46	52	2	34
2. Technical Systems	77	18	5	13
3. Law and Policy	60	38	2	24
4. Emergency Management	54	44	2	28
5. Risk Analysis	64	26	10	21
6. Critical Infrastructure	68	30	2	20
7. Strategic Planning	69	21	10	18
8. Terrorism Studies	78	22	0	14
9. Transportation Security	72	16	12	17
10. Environmental Security	52	16	32	21

Iteration 2. Prior to deploying this next iteration, the researcher used text analysis in *SurveyMonkey®* to compile and synthesize the 210 separate comments for those CAAs' descriptions that were in the *keep with edits* category from the previous iteration's eight CAAs. This ensured that the suggested comments from all of the participants were reflected in the revised description for each CAA. The revised descriptions of the CAAs were then included in the second iteration. Also in this second iteration of Round 1, the researcher compiled the 60 individual submissions from participants regarding new CAAs that should be included, and was able to reduce the total number down to 32, again using the text analysis function of *SurveyMonkey®* to combine similar elements and remove duplicate entries. Coupled with the eight CAAs from Iteration 1 that were in the *keep with edits* category, that made a total of 40

suggested CAAs to be processed in Iteration 2. Hence, a follow-on survey was sent to the 62 participants from Iteration 1; however, only 49 of the original 62 participants responded. This is an example of how participants can drop out during successive rounds or iterations in the Delphi methodology (Linstone & Turnoff, 2002). According to the literature, this type of drop out is to be expected in the Delphi process, but fortunately, the severity of the attrition rate tended to level out throughout the remainder of the study, with an average response rate of 40 participants per iteration.

In Iteration 2, the participants were asked to rank order the 40 revised CAAs derived from the first iteration. A typical undergraduate degree program in a university usually contains approximately 45 credit hours of core courses within the entire curriculum, which would equate to 15 core courses, applying the standard three credit hours per course. In order to begin to reduce the number of CAAs to a manageable level that would fit into a normal baccalaureate degree program, the participants were asked to pick their top 25 CAAs in this iteration. From a possible high number of 49, the researcher selected the CAAs with the most number of votes (highest frequency response rate) and determined the top 25. Since this iteration was designed to simply rank order the CAAs in their order of importance to an HS curriculum, there was no need to achieve a 75% consensus rate among the participants as in the previous iteration.

The responses for Round 1, Iteration 2 are shown in Table 7, with the entire revised list of 40 CAAs displayed, and the top 25 CAAs selected shown in boldface. With the top 25 CAAs established in this iteration, the survey progressed to the third and final iteration in Round 1, where the participants were asked to narrow down the list of

25 CAAs to their top 15, with the two original CAAs from Iteration 1 (shown in italics) to be included in the final count).

Table 7

Round 1, Iteration 2 Results: 25 Revised CAAs

Revised CAAs (N=49)	Frequency of Responses
All hazards threats critical analysis	**45**
Intelligence	**44**
Risk Analysis / Management	**43**
Critical Infrastructure	**42**
Emergency Management: Operations, NIMS, & NRF	**42**
Cyber Security – Information security	**41**
Disaster Response, Recovery, and Society	**40**
Law and Policy	**39**
Emergency Management	**38**
Border and immigration security	**37**
Fundamentals of HS Management	**37**
Government and National Policy	**37**
HS Organization	**37**
HS Policy Studies and Analysis	**37**
Interagency Coordination, Support, and Relations	**36**
Comparative Government for HS	**35**
Strategic Planning	**35**
Ethics, Integrity, and Leadership in HS	**33**
Transportation Security	**33**
Public-private Partnerships for HS	**32**
Strategic Communication	**32**
Weapons of Mass Destruction	**32**
Decision Making	**31**
Inter-operability	**31**
Research Methods and Statistical Analysis	**31**
Terrorism Studies	*n/a*
Homeland Security Technology	*n/a*
Creative and Critical Thinking:	30
Domestic and International Contexts	27
Military Support to Civilian Authorities	27
Psychology of Extremism and Victimology	27
Public Information / Affairs	25
Criminal Justice / Criminology	21
Cultural Assessment	21
Organizational Behavior	20

Revised CAAs (N=49)	Frequency of Responses
Economics of Security	18
Hazardous Material Management	17
Homeland Security Human Capital	17
Volunteer Resource Management	17
Environmental Security	14
Biometrics	12
Business Processes and Innovation	11

Note: The top 25 CAAs selected in this iteration are shown in boldface, while the two CAAs in italics were the original two agreed upon in Round 1, Iteration 1, and were added back to the final list, bringing the final total of CAAs to 17.

Iteration 3. In the third and final iteration of Round 1, participants were asked to choose their top 15 CAAs from the list of 25 that had been established in the previous iteration. As stated earlier, the number of 15 core courses was chosen because a typical undergraduate degree consists of approximately 120 credit hours, and of those total hours, usually about 45 hours comprise the typical program core block, in this case homeland security-specific courses. The rest of the curriculum is then made up of general education courses (such as English, math, sciences, etc.) and program support courses, specified electives, and perhaps minor courses of study. Therefore, a final list of 15 CAAs made perfect sense to the researcher (and the survey participants) in order to keep the list of core academic areas manageable in a typical curriculum and still allow for a diverse number of program-specific areas of study from which to choose.

The survey was sent to the 49 participants who responded in Iteration 2; however in this third iteration, only 46 of the earlier 49 participants responded. The results for Round 1, Iteration 3 are depicted in Table 8, with the with the entire revised list of 25 CAAs displayed, and the final top 15 CAAs selected by the participants in boldface. Including the two CAAs (# 2, Terrorism Studies and # 8, HS Technology, shown in

italics) that were agreed upon in the first Iteration of Round 1, that brought the total list of proposed CAAs up to 17, which was still a manageable final number.

Completion of Round 1 served to answer the first part of Research Question # 1, specifically what CAAs should comprise a baccalaureate degree in homeland security. With this final list of the participants' top 17 CAAs developed, the study progressed to the next round of the Delphi technique, where the participants were asked to arrive at consensus on a list of overarching program objectives (OPOs) that should make up a portion of the undergraduate degree curriculum in HS.

Table 8

Round 1, Iteration 3 Results: 15 Final CAAs

Revised CAAs (N=46)	Frequency of Responses
All Hazards Threats Critical Analysis	**44**
Critical Infrastructure	**40**
Risk Analysis / Management	**39**
Disaster Response, Recovery, and Society	**37**
Intelligence	**35**
Emergency Management: Operations, NIMS, and NRF	**33**
Cyber Security – Information security	**32**
HS Policy Studies and Analysis	**32**
Fundamentals of HS Management	**31**
Emergency Management	**30**
Interagency Coordination, Support, and Relations	**30**
Strategic Planning	**28**
Weapons of Mass Destruction	**28**
Law and Policy	**26**
Ethics, Integrity, and Leadership in HS	**25**
Terrorism Studies	*n/a*
Homeland Security Technology	*n/a*
Border and Immigration Security	24
HS Organization	23
Research Methods and Statistical Analysis	21
Comparative Government for HS	20
Decision Making	20

Revised CAAs (N=46)	Frequency of Responses
Strategic Communication	20
Inter-operability	19
Public-private Partnerships for HS	19
Government and National Policy	17
Transportation Security	16

Note: The CAAs shown in boldface were the 15 selected in this iteration, while the two CAAs in italics were the original two agreed upon in Round 1, Iteration 1, and were added back to the final list, bringing the total CAAs to 17.

Round 2. The second part of Research Question # 1 asked what overarching program objectives (OPOs) should be contained in an HS curriculum. In Round 2 the participants, after establishing a final list of 17 CAAs in the previous round, were asked to review and agree upon a list of proposed OPOs. The OPOs presented in Iteration 1 of this round were taken from the eight original ones identified by the ERAU study (Ramsay et al., 2010) and were submitted to the Delphi panel for consensus approval. As stated earlier, OPOs are defined as general education requirements - something that all HS students should be able to accomplish or demonstrate. Overarching program objectives refer to critical outcomes that do not necessarily or conveniently fall under an extant core academic area (CAA). Instead, they represent learning outcomes that can be accomplished by general education requirements of the university and hence do not necessarily need to be taught by the homeland security program. It is understood that institutions of higher learning have a wide variety of general education programs within their curriculum, to meet their constituents' needs. But to create an all-inclusive undergraduate curriculum in homeland security, which was the goal of this study, the researcher decided that developing a suggested list of overarching program objectives would be a vital, integral part of a standardized curriculum.

As an exemplar, the researcher looked to the model used by the Accrediting Body for Engineering and Technology (ABET Inc.), the largest, most established accrediting body in the United States. Since 2000, ABET has used outcomes-based assessment to measure the effectiveness of learning outcomes, including both program-specific and general education objectives (ABET, 2008). Ultimately, each academic program needs to accomplish the specific set of outcomes in its core curriculum, that is, the curriculum each student needs to take to satisfy the main degree requirement. Hence, a proposed curriculum containing not only core academic areas and program-specific outcomes, but also vital overarching program outcomes was deemed the best suitable approach to address the curriculum development issue.

Iteration 1. To begin, the eight OPOs from the ERAU study were used as a baseline and presented to the participants of the current study in the Delphi format of *keep as written*, *keep with edits*, or *delete* that was used in the early iterations of Round 1. A total of 39 participants responded to the first iteration of Round 2, as opposed to 46 in the last iteration of the previous round. Responses from this iteration were first analyzed to ascertain which, if any, of the eight suggested overarching program outcomes (OPOs) achieved the required 75% level of consensus. Of the eight OPOs proposed, only one (OPO # 3) achieved the required level of consensus in this first iteration. That single OPO, shown in boldface in the accompanying Table 9, was therefore adopted into the agreed upon list and was not submitted in further iterations of Round 2. A total of 92 separate comments were provided by the participants for the initial OPOs presented in this iteration, indicating what edits they felt were needed to the verbiage of the OPOs' description. For the seven OPOs that were selected as *keep with edits*, textual analysis

available in *SurveyMonkey®* was conducted on the 92 individual comments provided by the participants, and the researcher compiled similar elements and deleted duplicate entries, to arrive at a revised list and accompanying descriptions for these OPOs.

Additionally, participants were asked to submit any new OPOs that they felt should be included in an undergraduate degree curriculum for homeland security. Again, the response from the panel was considerable, with 30 new OPOs submitted, indicative of the high degree of participation of the Delphi panelists. The results from the original OPOs first presented to the Delphi panel in Round 2 are shown in Table 9.

Table 9

Round 2 – Iteration 1: Consensus on Initial OPOs

Proposed OPOs (N=39)	% Keep as Written	% Keep with Edits	% Delete	# of Comments
OPO1. An ability to apply homeland security or defense concepts in a non-academic setting through an internship, cooperative, or supervised experience to include real-world experiences, strategies, and objectives	64	31	5	15
OPO2. An ability to apply undergraduate-level research methods and statistical analysis (knowledge of mathematics and physical science) to homeland security issues	63	32	5	13
OPO3. An ability to work collaboratively in a diverse team or group, employing sound decision-making and communications	**79**	**16**	**5**	**7**

Proposed OPOs (N=39)	% Keep as Written	% Keep with Edits	% Delete	# of Comments
OPO4. A recognition of transnational and global application (interoperability) of homeland security or defense issues, strategies and operations	55	29	16	12
OPO5. An ability to design, conduct and evaluate drills or exercises applicable to the disciplines of homeland security	53	29	18	16
OPO6. An ability to identify, describe, and critically evaluate applicable homeland security or defense technologies	72	18	10	9
OPO7. Knowledge of contemporary or emergent threats, challenges, or issues including natural, man-made, and technological hazards	71	29	0	11
OPO8. Demonstrate the ability to synthesize, analyze, or evaluate homeland security or homeland defense issues or challenges (i.e., either a capstone practicum or undergraduate thesis).	74	21	5	9

Note: The single OPO achieving consensus in this iteration is shown in boldface.

Iteration 2. In this second iteration, there were seven remaining OPOs that were revised and compiled into a new list that was presented via survey to the participants. The same Delphi format of *keep as written*, *keep with edits*, or *delete* was used in this iteration for consistency and reliability of research. According to Gay and Airasian (2000), "reliability is the degree to which a test consistently measures whatever it is measuring" (p. 169). Sekaran (2003) states, "Reliability refers to the consistency and stability of the measurement instrument and means freedom from random error" (p. 422).

Therefore, to ensure reliability and consistency of data, the survey instruments used in this study attempted to closely conform to those methodologies used during the model ERAU study of Ramsay et al. (2010).

A total of 36 participants responded to the second iteration of Round 2, as opposed to 39 in the previous iteration. Again, the slight decline in participation is forecast in a multi-round Delphi study (Linstone, & Turnoff, 2002). Responses from this iteration were first analyzed to ascertain which, if any, of the remaining seven OPOs achieved the required 75% level of consensus. Of the revised OPOs proposed in this iteration, two (OPO # 2 and OPO # 7) achieved the 75% or greater required level of consensus, and are shown in boldface in the accompanying Table 10. Those two OPOs were therefore adopted into the agreed upon list and were not submitted in further iterations of Round 2. A total of 68 separate comments were provided by the participants for the second iteration of OPOs, which depicts a steady decrease in the number of participants' comments from iteration to iteration. This researcher believes that indicated a move towards increased consensus, or in other words, a fine-tuning of descriptions of CAAs and OPOs so that the panel found less to object about on subsequent iterations. For the five OPOs that did not reach 75% consensus, but were tagged as *keep with edits*, textual analysis available in *SurveyMonkey*® was conducted on the 68 individual comments provided by the participants, and the researcher compiled similar elements and deleted duplicate entries, to arrive at a new revised list and accompanying descriptions for these OPOs to be submitted in Iteration 3.

In this and following iterations of Round 2, the participants were not asked to submit any new OPOs, as the researcher intended to concentrate all of the panelist's

effort on reaching consensus on the remaining OPOs if possible. Table 10 shows the results from the revised list of OPOs proposed in Iteration 2 of Round 2.

Table 10

Round 2 – Iteration 2: Consensus on Revised OPOs

Revised OPOs (N=36)	% Keep as Written	% Keep with Edits	% Delete	# of Comments
OPO1. An ability to apply homeland security or defense concepts in a non-academic setting through an internship, cooperative, or supervised experience to include real-world experiences, strategies, and objectives	72	19	8	7
OPO2. An ability to apply undergraduate-level research methods and statistical analysis (knowledge of mathematics and physical science) to homeland security issues	**77**	**20**	**3**	**8**
OPO4. A recognition of transnational and global application (interoperability) of homeland security or defense issues, strategies and operations	44	50	6	17
OPO5. An ability to design, conduct and evaluate drills or exercises applicable to the disciplines of homeland security	56	28	17	11
OPO6. An ability to identify, describe, and critically evaluate applicable homeland security or defense technologies	57	37	6	13
OPO7. Knowledge of contemporary or emergent threats, challenges, or issues including natural, man-made, and technological hazards	**80**	**20**	**0**	**6**

Revised OPOs (N=36)	% Keep as Written	% Keep with Edits	% Delete	# of Comments
OPO8. Demonstrate the ability to synthesize, analyze, or evaluate homeland security or homeland defense issues or challenges (i.e., either a capstone practicum or undergraduate thesis).	69	20	11	6

Note: the OPOs shown in boldface depict the ones achieving consensus in this iteration.

Iteration 3. In this third iteration, there were five remaining OPOs that were revised and compiled into a new list that was presented via survey to the participants. The same Delphi format of *keep as written, keep with edits*, or *delete* was used in this iteration for consistency and reliability of research data. A total of 39 participants responded to the third iteration of Round 2, which is actually three more than the previous iteration. As in earlier iterations, responses from this iteration were first analyzed to ascertain which, if any, of the remaining five OPOs achieved the required 75% level of consensus. Of the revised OPOs proposed in this iteration, two (OPO # 1 and OPO # 8) achieved the 75% or greater required level of consensus, and are shown in boldface in the accompanying Table 11. Those two OPOs were therefore adopted into the agreed upon list and were not submitted in further iterations of Round 2. A total of 32 separate comments were provided by the participants for the third iteration of OPOs, which continues to show an improving level of agreement among the panelists, which is common in a Delphi round that has multiple iterations on the same basic topic (Holey et al., 2007). For the five OPOs that did not reach 75% consensus, but were tagged as *keep with edits*, textual analysis available in *SurveyMonkey®* was conducted on the 32 individual comments provided by the participants, and the researcher compiled similar

elements and deleted duplicate entries, to arrive at a newly revised list and accompanying descriptions for these OPOs to be submitted in Iteration 4.

In this and following iterations of Round 2, the participants were not asked to submit any new OPOs, as the researcher intended to concentrate all of the panelist's effort on reaching consensus on the remaining OPOs if possible. The results listed in Table 11 depict the revised list of OPOs for Iteration 3 of Round 2.

Table 11

Round 2 – Iteration 3: Consensus on Revised OPOs

Revised OPOs (N=39)	% Keep as Written	% Keep with Edits	% Delete	# of Comments
OPO1. An ability to apply homeland security or defense concepts in a non-academic setting through an internship, co-operative, or supervised experience to include real-world experiences and objectives	**82**	**11**	**8**	**6**
OPO4. A recognition of transnational and global application (interoperability) of homeland security or defense issues, strategies and operations	68	30	3	12
OPO5. An ability to design, conduct and evaluate drills or exercises applicable to the disciplines of homeland security	71	13	16	7
OPO6. An ability to identify, describe, and critically evaluate applicable homeland security or defense technologies	62	32	5	13
OPO8. Demonstrate the ability to synthesize, analyze, or evaluate homeland security or homeland	**84**	**13**	**3**	**6**

Revised OPOs (N=39)	% Keep as Written	% Keep with Edits	% Delete	# of Comments
defense issues or challenges (i.e., either a capstone practicum or undergraduate thesis).				

Note: the OPOs shown in boldface depict the ones achieving consensus in this iteration.

Iteration 4. In this fourth iteration, there were three remaining OPOs that were revised and compiled into a new list that was presented via survey back to the participants for consensus. The same Delphi format of *keep as written, keep with edits*, or *delete* was used in this iteration for consistency and reliability of research data. While many literature sources reviewed in Chapter 2 stated that a traditional Delphi methodology normally consists of three rounds (or iterations per round), this researcher decided to continue with the iterations in Round 2, because it was felt that the list of OPOs was relatively short, with only eight items, and that consensus was important on these often overlooked elements of a curriculum. According to von der Gracht (2008), the optimal number of iterations can be defined as "the minimum number of rounds necessary to reach an acceptable level of accuracy" (p. 46). For this study, the researcher decided it was necessary to achieve a high level of accuracy regarding OPOs in order to set the stage for the important task of reaching consensus in the next round on Program Specific Outcomes (PSOs) that make up the heart of a curriculum. Tieglaar et al. (2004) commented that all learning outcomes are important in a curriculum and should be developed with equal care and attention to detail, both program level outcomes and general education outcome.

Once again, a total of 39 participants responded in this fourth iteration of Round 2, the same as the previous iteration, which the researcher felt indicated that the dropout

rate had leveled off, and that the remaining participants were willing to remain associated with the study until its conclusion was reached. As in earlier iterations, responses from this iteration were first analyzed to ascertain which, if any, of the remaining three OPOs achieved the required 75% level of consensus. Of the revised OPOs proposed in this iteration, only one (OPO # 5) achieved the 75% or greater required level of consensus, and is shown in boldface in the accompanying Table 12. That single OPO was therefore adopted into the agreed upon list along with previous OPOs and was not resubmitted in further iterations of Round 2. This left only two remaining OPOs that needed consensus in the fifth iteration. A total of 30 separate comments were provided by the participants for the fourth iteration of OPOs, which continues to show an improving level of agreement among the panelists, which is common in a Delphi round that has multiple iterations on the same basic topic (Holey et al., 2007). For the two remaining OPOs that did not reach 75% consensus, but were tagged as *keep with edits*, textual analysis available in *SurveyMonkey®* was conducted on the 30 individual comments provided by the participants, and the researcher compiled similar elements and deleted duplicate entries, to arrive at a newly revised list and accompanying descriptions for these OPOs to be submitted in Iteration 4.

In the previous and the final iteration of Round 2, the participants were not asked to submit any new OPOs, as the intent was to concentrate all of the panelist's effort on reaching consensus on the remaining OPOs. Shown in Table 12 are the results from the revised list of OPOs presented to the Delphi panel in Iteration 4 of Round 2.

Table 12

Round 2 – Iteration 4: Consensus on Revised OPOs

Revised OPOs (N=39)	% Keep as Written	% Keep with Edits	% Delete	# of Comments
OPO4. A recognition of transnational and global application (interoperability) of homeland security or defense issues, strategies and operations	67	28	5	11
OPO5. An ability to design, conduct and evaluate drills or exercises applicable to the disciplines of homeland security	**82**	**10**	**8**	**6**
OPO6. An ability to identify, describe, and critically evaluate applicable homeland security or defense technologies	62	28	10	3

Note: the OPOs shown in boldface depict the ones achieving consensus in this iteration.

Iteration 5. For the final iteration of Round 2, there were only two remaining OPOs that were revised and compiled into the culminating list that was presented via survey back to the participants for consensus. The same Delphi format of *keep as written*, *keep with edits*, or *delete* was used in this iteration for consistency and reliability of research data. The researcher was keenly aware that prolonged iterations and the passage of long blocks of time between rounds could have an impact on opinions of the participants, and kept this fact in mind when deciding to continue Round 2 for more iterations than the average Delphi study. Hsu and Sandford (2007) address this potential weakness of the Delphi methodology and remind Delphi investigators that they must be "cognizant, exercise caution, and implement the proper safeguards in dealing with this issue" (p. 5). Therefore, a conscious decision was made to exceed the number of

iterations suggested by the classic Delphi methodology in order to achieve a high degree of consensus on the overarching program outcomes. The reasoning was that OPOs are sometimes thought of as general education outcomes and are therefore ignored when developing a program-specific curriculum. The stated goal of this study was to use the Delphi technique to develop a standardized, outcomes-based undergraduate curriculum for homeland security, and the researcher concluded that OPOs were equally important as any other outcomes. In fact, OPOs were considered as important stepping-stones to the next round, which was consensus on the vital program specific objectives (PSOs) associated with the core academic areas (CAAs) already developed in the study. This logic is borne out by studies such as ABET (2008); Okoli & Pawlowski (2004); and Riggs (1983).

Lastly, in this final iteration, a total of 32 participants responded, which was a slight decline as compared to previous iterations, but not enough to statistically alter the research data. As in previous iterations, responses from this final iteration were first analyzed to ascertain which, if any, of the remaining two OPOs achieved the required 75% level of consensus. Of the two revised OPOs proposed in this last iteration, (OPO# 4 and OPO # 6), both achieved the 75% or greater required level of consensus, and are is shown in boldface in the accompanying Table 13. Agreement on those two remaining OPOs meant that the participants had reached consensus on all eight of the proposed overarching program objectives in the study – albeit requiring five iterations to do so. Since overall consensus was reached on all eight of the OPOs during this iteration, the researcher did not employ the textual analysis function available in *SurveyMonkey*®.

In this final iteration of Round 2, the participants were not asked to submit any new OPOs, in order to focus their all of their concentration and effort on reaching consensus on the remaining OPOs if possible. The data gathered in Round 2 addressed the second part of Research Question # 1, namely the overarching program objectives that should comprise an undergraduate degree curriculum in HS. The results from the revised list of OPOs presented to the Delphi panel in Iteration 5 of Round 2 are shown in Table 13.

Table 13

Round 2 – Iteration 5: Final Consensus on Eight OPOs

Revised OPOs (N=32)	% Keep as Written	% Keep with Edits	% Delete	# of Comments
OPO4. A recognition of transnational and global application (interoperability) of homeland security or defense issues, strategies and operations	**77**	**16**	**7**	**6**
OPO6. An ability to identify, describe, and critically evaluate applicable homeland security or defense technologies	**77**	**10**	**13**	**5**

Note: the final two OPOs agreed upon by the panelists in this iteration are shown in boldface.

Round 3. For the third round of the study, in order to answer the third element in Research Question # 1, participants were asked to revisit the core academic areas (CAAs) developed in Round 1 and to reach consensus of a list of proposed program-specific objectives (PSOs) to accompany each of the CAAs that were established earlier in the study. (Note: Table 8 lists the final 17 CAAs developed by the Delphi panelists at the completion of Round 1).

During the elapsed time between the initial deployment of Round 1 and the completion of Round 2, the researcher continued to analyze and compile the data collected to that point, and in an effort to condense and focus the effort on the PSOs, decided to combine two of the 17 core academic areas into a more cohesive list of CAAs from which to work. Since the original list of 17 CAAs contained two separate entries for Emergency Management, (CAA # 6 - Emergency Management: Operations, NIMS and NRF, and CAA # 11 – Emergency Management), it was decided to combine these two CAAs into one, labeled simply Emergency Management (now CAA # 5). Additionally, the elements contained in the CAA labeled HS Technology (CAA # 16) were not deemed sufficiently robust to warrant a separate CAA, they were incorporated into the objective for the CAA labeled Weapons of Mass Destruction (now CAA # 15). That brought the current list of CAAs back to the original desired number of 15, and these were presented to the participants in the first iteration of Round 3. According to von der Gracht (2008), one of the documented disadvantages of the Delphi technique is loss of participants, or increased dropout rate, if rounds and iterations become too repetitive in nature or are allowed to continue for a protracted time. Hence, the revisions to the original CAAs were made in the interest of completing the survey in a timely manner, and to prevent subjecting the participants to an inordinate number of iterations to reach consensus on the large list of CAAs.

For each of the core academic areas (CAAs) that were identified from Round 1, the researcher presented a list of three proposed program specific objectives (PSOs) on which to reach consensus (defined as 75% agreement on the inclusion and wording of a particular PSO). The researcher realized that there were certainly more than three

potential PSOs for each of the 15 CAAs identified thus far. However, with such a wide and dynamic field of study in homeland security and a diverse group of panelists participating in this survey, it was impractical to list every possible PSO that could be identified for the 15 CAAs presented. Indeed, in the first iteration of Round 3, there were a list of 45 proposed PSOs, and a potential of 15 new PSOs from the panelists, making a total of 60 PSOs that must be reviewed and agreed upon – a daunting challenge.

The researcher fully appreciates that each academic institution offering a degree in homeland security studies would have the prerogative to modify any suggested, standardized list of CAAs, OPOs, or PSOs developed by this study. This line of reasoning follows the advice in a study by Drabek, "Decisions regarding curricular content and assessments of academic excellence must come from within institutions and the accreditation procedures and bodies they construct" (p. 21).

Thus, the main effort of this study was to survey subject matter experts as to the basic elements that should make up an undergraduate curriculum in homeland security. The final results of the study were intended to be used as a suggested guide for constructing an undergraduate curriculum in homeland security, not as the final word on the subject of HS curriculum development.

Iteration 1. In the first iteration of Round 3, the participants were presented with a list of three PSOs for each of the 15 CAAs and asked to select one of the familiar Delphi options used in Round 1: *keep, as written*, *keep, with edits*, or *delete*. As in earlier rounds, the participants were also given the opportunity to submit a new PSO for any of the CAAs from Round 1. This resulted in a list of 60 potential PSOs (45 directly associated with the PSOs presented and 15 new PSOs submitted by the participants).

Level of response in the three iterations of Round 3 averaged 34, with 36 members beginning Iteration 1, but only 34 completing the survey in full in that round. Of the 45 PSOs presented to the Delphi panel, 27 (or 60%) achieved the required level of consensus on this first iteration. Those 27 PSOs were then considered complete, and were deleted from subsequent iterations. The data in the remaining 18 PSOs from Iteration 1 that were in the *keep with edits* or *delete* category had a total of 176 separate comments regarding suggested improvements to the PSO descriptions. All of these comments were analyzed using the *SurveyMonkey*® software, compiled and synthesized, and incorporated into the resubmission of Iteration 2 for further consensus building. The results from Round 3, Iteration 1 are depicted in Table 14.

As stated earlier, Iteration 1 offered the participants the ability to submit new proposed PSOS for each of the CAAs presented. In this iteration, the participants chose to add 32 new PSOs to the proposed list. The text analysis feature of *SurveyMonkey*® was again employed to compile and condense these wording of new PSOs into revised descriptions that were resubmitted to the Delphi panel in Iteration 2 of Round 3 for further consensus.

Table 14

Round 3 - Iteration 1: Consensus on Initial PSOs

Initial Proposed PSOs (N=34)	% Keep as Written	% Keep with Edits	% Delete	# of Comments	# of New PSOs
PSO1	73	23	4	6	
PSO2	62	31	7	14	
PSO3	**87**	**10**	**3**		
PSO4					2
PSO5	**76**	**24**	**0**		
PSO6	63	33	4	12	
PSO7	60	30	10	12	

Initial Proposed PSOs (N=34)	% Keep as Written	% Keep with Edits	% Delete	# of Comments	# of New PSOs
PSO8					2
PSO9	**77**	**20**	**4**		
PSO10	**90**	**7**	**3**		
PSO11	54	40	7	12	
PSO12					2
PSO13	68	21	11	7	
PSO14	66	35	0	15	
PSO15	60	24	17	9	
PSO16					3
PSO17	68	32	0	11	
PSO18	69	24	7	7	
PSO19	**75**	**31**	**4**		
PSO20					1
PSO21	**77**	**4**	**20**		
PSO22	**90**	**7**	**4**		
PSO23	**83**	**7**	**10**		
PSO24					3
PSO25	66	35	0	13	
PSO26	**77**	**19**	**7**		
PSO27	**77**	**13**	**10**		
PSO28					4
PSO29	**79**	**14**	**7**		
PSO30	67	19	15	7	
PSO31	**77**	**11**	**0**		
PSO32					0
PSO33	50	40	10	13	
PSO34	**79**	**14**	**7**		
PSO35	**83**	**14**	**3**		
PSO36					0
PSO37	**86**	**14**	**0**		
PSO38	**86**	**7**	**7**		
PSO39	**96**	**4**	**0**		
PSO40					3
PSO41	69	14	17	7	
PSO42	**83**	**17**	**0**		
PSO43	**79**	**17**	**3**		
PSO44					2
PSO45	74	15	11	11	
PSO46	**79**	**18**	**4**		
PSO47	**85**	**7**	**7**		
PSO48					0
PSO49	**93**	**7**	**0**		

Initial Proposed PSOs (N=34)	% Keep as Written	% Keep with Edits	% Delete	# of Comments	# of New PSOs
PSO50	**78**	**11**	**11**		
PSO51	61	21	18	6	
PSO52					2
PSO53	**90**	**7**	**3**		
PSO54	**75**	**18**	**7**		
PSO55	**80**	**16**	**4**		
PSO56				9	4
PSO57	**75**	**21**	**4**		
PSO58	69	14	17	6	
PSO59	**78**	**18**	**4**		
PSO60				9	4

Note: PSOs in boldface indicate ones that achieved 75% or greater consensus in this first iteration of Round 3. Those PSOs in italics represent new elements submitted by participants for the first time in this iteration; hence these do not have a percentage associated.

Iteration 2. In the second iteration of Round 3, the participants were this time presented with a list of only those 18 PSOs that did not achieve the required 75% consensus in Iteration 1, plus the 12 new PSO submitted by the participants in the previous iteration. The PSOs in this iteration were reworded to include the edits and suggestions from the participants in Iteration 1. In Iteration 2, the Delphi panelists were presented with a list of 30 PSOs and were asked to select one of the options used in previous rounds: *keep, as written*, *keep, with edits*, or *delete*. Unlike the previous iteration, participants were not given the opportunity to suggest any new PSOs in this and subsequent iterations, as the main thrust of work in this and the follow-up iterations was to reach consensus on the remaining PSOs if possible.

The level of response in this iteration was 33, only one less than the previous iteration, which indicated to the researcher that the participants had stabilized into a predictable number of respondents that were going to continue until completion of the project. Of the 30 PSOs presented to the Delphi panel, 20 (or 67%) achieved the required

level of consensus on this second iteration. Those 20 PSOs were then considered complete, and were deleted from subsequent iterations. The data in the remaining 10 PSOs from Iteration 2 that were in the *keep with edits* or *delete* category had a total of 73 separate comments regarding suggested improvements to the PSO descriptions. All of these comments were analyzed using the *SurveyMonkey*® software, compiled and synthesized, and incorporated into the resubmission of the third and final iteration of Round 3 for further consensus building. Table 15 depicts the results from Round 3, Iteration 2.

Table 15

Round 3 - Iteration 2: Consensus on Revised PSOs

Initial Proposed PSOs (N=33)	% Keep as Written	% Keep with Edits	% Delete	# of Comments
PSO1	**97**	**3**	**0**	**1**
PSO2	**88**	**9**	**3**	**3**
PSO4	**79**	**15**	**6**	**6**
PSO6	**88**	**9**	**3**	**2**
PSO7	**76**	**24**	**0**	**7**
PSO8	58	24	18	9
PSO11	**76**	**18**	**6**	**5**
PSO12	**90**	**10**	**0**	**3**
PSO13	70	27	3	8
PSO14	72	25	3	7
PSO15	67	24	9	7
PSO16	61	27	12	8
PSO17	73	24	3	8
PSO18	**85**	**12**	**3**	**5**
PSO20	**78**	**22**	**0**	**6**
PSO24	69	6	25	4
PSO25	**85**	**15**	**0**	**4**
PSO28	55	27	18	9
PSO30	61	18	21	5
PSO33	**84**	**13**	**3**	**5**
PSO40	**77**	**7**	**16**	**2**
PSO41	**85**	**15**	**0**	**4**

Initial Proposed PSOs (N=33)	% Keep as Written	% Keep with Edits	% Delete	# of Comments
PSO44	**76**	**15**	**9**	**6**
PSO45	**82**	**15**	**3**	**5**
PSO51	**79**	**18**	**3**	**6**
PSO52	61	24	15	8
PSO56	**94**	**6**	**0**	**2**
PSO58	**82**	**18**	**0**	**6**
PSO59	**82**	**15**	**3**	**5**
PSO60	**85**	**12**	**3**	**4**

Note: PSOs in boldface indicate ones that achieved 75% or greater consensus in this second iteration of Round 3.

Iteration 3. In the third and final iteration of Round 3, the participants were presented with a list of only those 10 remaining PSOs that did not achieve the required 75% consensus in Iteration 2. The PSOs in this iteration were reworded to include the edits and suggestions from the participants in Iteration 2. In this iteration, the Delphi panelists were presented with a list of 10 PSOs and were asked to select one of the options used in previous rounds: *keep, as written*, *keep, with edits*, or *delete*. As in Iteration 2, participants were not given the opportunity to suggest any new PSOs in this final iteration, as the goal in this round was to reach consensus on the remaining PSOs if possible.

The level of response in this final iteration was 32 participants, only one less than the previous iteration, which again indicated to the researcher that a stable base of participants had remained committed to completion of the research study. Of the 10 PSOs presented to the Delphi panel, three (or 33%) achieved the required level of consensus on this final iteration of Round 3. Those three PSOs were then considered complete, and were added to the list of agreed upon PSOs from the previous iterations. The remaining seven PSOs, having been through three iterations without achieving

participants' consensus at a 75% or greater level, were considered unsuitable and were deleted from the list of PSOs in this study. With three of the potential 60 PSOs never having input submitted, and seven not achieving the required consensus level through three iterations, the final number of consensually approved PSOs was 50 for this study.

As in previous iterations, all of the comments received in Iteration 3 were analyzed using the *SurveyMonkey®* software, compiled and synthesized, and were incorporated into the submission of the third and final iteration of Round 3. Similarly, the participants' 13 comments from the three PSOs agreed upon in Iteration 3 were added to the final draft of the PSOs included in the study. The results from Round 3, Iteration 3 are depicted in Table 16.

Table 16

Round 3 - Iteration 3: Final Consensus on Revised PSOs

Initial Proposed PSOs (N=32)	% Keep as Written	% Keep with Edits	% Delete	# of Comments
PSO8	50	20	30	8
PSO13	**81**	**13**	**6**	**4**
PSO14	58	16	26	7
PSO15	72	19	9	6
PSO16	**75**	**6**	**19**	**3**
PSO17	**81**	**16**	**3**	**6**
PSO24	63	6	31	3
PSO28	60	13	37	7
PSO30	71	13	16	7
PSO52	56	22	22	8

Note: PSOs in boldface indicate ones that achieved 75% or greater consensus in this final iteration of Round 3.

Research Question # 1 was answered in full at the completion of Round 3, with the consensual development of a total of 50 PSOs from the Delphi panel. These 50 program specific objectives, along with their associated 15 core academic areas, and the

eight accompanying overarching program objectives/outcomes from earlier rounds made up the essential pedagogical elements of a proposed baccalaureate curriculum in homeland security recommended by this study. Each of the separate elements in this proposed curriculum was vetted by iterative consensus using the Delphi technique with a panel of SMEs in homeland security, and therefore the validity of the research study was upheld while the research questions were being answered. (The resultant model curriculum derived from Rounds 1, 2, and 3 is shown in Tables 51 and 52).

Research Question 2

The second research question posed in this study asked: *What areas of overlap exist between this study's final set of CAAs, OPOs, and PSOs and those developed by earlier studies, particularly the Ramsay et al. (2010) study?* In order to fully answer this question, recent scholarly studies relating to HS curriculum development were closely examined for overlap or linkage. The literature review conducted in Chapter 2 revealed a general lack of a standardized, peer-reviewed, outcomes-based curriculum for programs of academic homeland security. While some recent studies have utilized various forms of the Delphi technique to gain consensus among a panel of experts, and that seminal work helped set the stage for further research such as this, no single research project to date has incorporated the principles of outcomes-based education and generated a comprehensive list of core academic areas and associated program specific objectives that would comprise a standardized HS curriculum.

Therefore, to draw a comparison between earlier research and that of this study, a thorough examination was made of the recent HS curriculum development studies conducted. These reference works were a combination of papers in peer-reviewed

journals and completed doctoral dissertations. The studies chosen for closer analysis were Bradshaw, 2011; France, 2012; Polson et al., 2010; Ramirez & Roux, 2012; Ramsay et al., 2010, and Winegar, 2008. In the spirit collegial research, this current study built upon those earlier projects and attempted to add to the body of knowledge regarding homeland security curricula. A brief discussion of the major points of the referenced studies is conducted below in order to draw comparisons and determine degree of overlap, per Research Question 2.

The study done by Winegar (2008), based on a meta-analysis survey of select universities offering HS programs, select HS professionals, and select college students majoring in HS, compiled a list of the top 10 areas that should comprise a core curriculum in HS studies. That study was one of the earliest comprehensive examinations of HS curriculum development, and set the standard for research into the topic, but it did not provide recommended program specific outcomes to go along with the suggested core courses. Winegar did point out that institutions offering a homeland security degree that has been accredited by a recognized organization would provide a quality degree that is "rare and exclusive, with much higher inherent value" (2008, p. 51).

In another study, Polson et al. (2010) examined several earlier approaches to HS curriculum development and identified a list of five core competencies for homeland security professionals and a separate list of six required core courses for an HS curriculum. That work compiled input from a variety of professionals in the field of emergency management and homeland security to arrive at the list of competencies and core courses, but again, did not suggest any measurable program specific objectives,

aligned with Bloom's taxonomy, that would enable an institution to implement a fully functioning model curriculum.

Two recent doctoral dissertation studies conducted by Bradshaw, 2011 and France, 2012), examined the necessary components of a homeland security curriculum. In both of these studies, the researchers utilized the Delphi technique to poll a panel of subject matter experts to reach consensus on the required curriculum elements of an undergraduate homeland security degree program. The first, Bradshaw (2011), surveyed approximately 20 participants in his study and identified 13 unique subject matter areas that should be considered as essential courses in an HS curriculum. The following year, France conducted a similar Delphi-based qualitative study which "examined the knowledge, skills, and abilities deemed important in homeland security in order to determine the emphasis to be placed in designing reliable homeland security education programs" (2012, p. 75). France's study surveyed a panel of 16 homeland security subject matter experts to arrive at a list of eight essential topic areas for a homeland security curriculum. Additionally, France's study identified a list of five essential skills and abilities needed by homeland security program graduates and generated a list of eight criteria to serve as benchmarks in an academic homeland security program (2012).

Finally, Ramirez and Rioux (2012) employed an education needs assessment with a select set of Department of Homeland Security (DHS) personnel, asking participants to rank 52 suggested courses for inclusion into a proposed HS curriculum. Using the results from a mean ranking of subjects, this study identified the top 10 HS subjects/courses that might make up an undergraduate curriculum. This was a novel approach, soliciting input from DHS personnel and not academic subject matter experts as the earlier studies had

done. However, Ramirez and Rioux's study had the same shortcomings as the others examined in this paragraph – namely, the lack of measurable, outcomes-based, program specific objectives (PSOs). It is interesting to note that these earlier studies, while developing some list of key courses and essential topics, did not attempt to construct a set of program-specific objectives that could utilized by HS faculty to develop a unified, standardized undergraduate curriculum – one that could be easily reviewed and approved by a national accrediting body. Hence, the purpose of this study, focused in Research Question 2.

There is always an exception to the rule, and as far as HS curriculum development is concerned, that one exception was the study conducted by Ramsay et al. (2010) at Embry-Riddle Aeronautical University (ERAU). This earlier study did employ a similar methodology as used in this researcher's current study, but the previous ERAU research surveyed a much smaller population (N=8), whereas, the current study surveyed the entire potential population (N=338) of the University and Agency Partnership Initiative (UAPI), a membership of academic homeland security professionals. With that in mind, this researcher chose to build upon these earlier studies, and using the ERAU report (Ramsay et al., 2010) as a case study model, sought to develop via Delphi consensus a standardized homeland security undergraduate degree curriculum.

The ERAU study used the Delphi technique in a series of iterative rounds to poll a virtual advisory board of homeland security SMEs regarding the elements that should comprise an HS degree curriculum. The basic purpose of the ERAU study was ". . . to develop and test a consensus set of core academic areas that could be used to represent the breadth of the homeland security enterprise in an undergraduate curriculum" (Ramsay

et al., 2010, p. 2). The ERAU study resulted in the panelists identifying eight general program-level outcomes (OAs) and eight core academic areas (CAs), including definitions of those CAs, along with a set of student learning outcomes (SLOs) in each of the eight academic areas (see Tables 3, 4, and 5 for a list of the results of the ERAU 2010 study).

The initial research done by Ramsay et al. (2010) was what motivated the current study, which did produce data that served to uphold the overall validity of the earlier ERAU research. Additionally, a thorough review of similar studies underscored the fact that although some research has been done into HS curriculum, no single study to date has developed a complete list of measurable program level outcomes/objectives that were vetted by a field of academic SMEs. By examining the overlap between earlier HS curriculum development studies, and the proposed curriculum presented in this study, a direct line was drawn that traces the evolution of academic homeland security from a nascent field into a mature academic discipline, worthy of a standardized curriculum and national accreditation. This conclusion fully answers research Question 2 in that the genesis of homeland security curriculum development does depict a degree of overlap or similarity between major studies conducted on the subject, and therefore lends an air of reliability and validity to the research topic.

Research Question 3

Finally, the third research question posed by this study asked: *What additional elements are of importance to the academic field regarding the development of an HS degree program?* To answer this question, a one-iteration culminating round was developed for the study. The researcher constructed a survey that gathered demographic

data from the participants in the first section of the survey, and elicited the participants' input on a set of questions pertaining to homeland security curricula development in the second section (see Appendix F). The structure of the demographic portion of the survey in Round 4 was straightforward, asking the participants for such information as their current profession, their time in that profession, and their level of education obtained. The second section of the survey instrument in Round 4 was based on a 5-point Likert scale. The Likert scale is a popular instrument to measure attitudes, preferences, opinions, and ideas. Kislenko and Grevholm (2008) noted that while there seems to be a large variety of statistical methodology used to analyze Likert-type items, the Likert scale is by definition an ordinal scale. Therefore, the data collected in Round 4 was treated as ordinal data and was examined using nonparametric methodology such as mean. The results derived from the single iteration survey of Round 4 are discussed in further detail in the following sections.

Round 4. An average of 33 participants responded to the questions in Round 4, which was on par with the overall survey average of 40 for the other rounds. Questions 1 through 9 captured demographic data regarding the survey participants. Questions 10 – 33 utilized a 5-point Likert scale to rate the participants' opinions on a variety of topics concerning homeland security curricula development. Finally, questions 34 – 36 asked the participants to rank order a list of broad subject matter areas that might be included in the curriculum for an Associate's, Bachelor's, and Master's degree in homeland security.

Bellavita (2008) stated academe's mission clearly, "Our challenge as homeland security scholars is developing and implementing undergraduate and graduate curriculum that is grounded in a set of core competencies, and continually adapts to future threats,

hazards, risks and vulnerabilities" (p. 3). Therefore, it was important to ascertain what today's SMEs in homeland security felt should constitute a set of subject matter areas in the various levels of academic degree.

The data gathered on participant demographics helped to determine the levels of experience of the subject matter experts chosen from the membership of the University Agency Partnership Initiative (UAPI) to serve as the survey population. As shown in Table 17, the survey population that responded to this question (N=33) was comprised mostly of faculty from institutions of higher learning, with members from the fields of research, management or administration, government or military, and other professional organizations making up the remainder of the participants. Since the UAPI membership that was surveyed consisted mostly of academics, it is not surprising that the largest number of respondents to Question 1, almost 2/3 were faculty members.

Table 17

Round 4 – Question 1 Results: Occupation Type

Q1. Which one of the following best describes your current occupation? (N=33)

Answer Options	Response Percent	Response Count
Faculty	63.3	21
Researcher	6.1	2
Management / Administration	15.2	5
Government / Military	9.1	3
Other	6.1	2

In the second question of the demographic section, the panelists were asked to state the length of time that they had served in the field of homeland security. Again, this question was designed to show the years of experience among the panel members to

substantiate their inclusion as SMEs in homeland security. As depicted in Table 18, the largest number of Delphi panelists had from 6 – 15 years of HS experience, while the second largest group had over 20 years of HS experience, while the remaining panelists fell into the 1 – 5 years, 16 – 20 years, and not applicable categories, respectively.

Table 18

Round 4 – Question 2 Results: Length of Occupation

Q2. How long have you been actively involved in the homeland security field? (N=33)

Answer Options	Response Percent	Response Count
1 - 5 years	9.1	3
6 - 15 years	45.5	15
16 - 20 years	3.0	1
over 20 years	39.4	13
not applicable	3.0	1

Question 3 asked how long the participants had been involved with teaching in an academic field of homeland security. The largest block of responses indicated an average teaching experience of 6 – 15 years, while the other categories' counts ranged from over 20 years, 16 – 20 years, and 1 – 5 years, with all 33 respondents reporting some level of teaching experience. The results from Round 4 – Question 3 are depicted in Table 19.

Table 19

Round 4 – Question 3 Results: Teaching Experience

Q3. How long have you been actively involved in the teaching/academic field? (N = 33)

Answer Options	Response Percent	Response Count
1 - 5 years	18.2	6
6 - 15 years	36.4	12

Answer Options	Response Percent	Response Count
16 - 20 years	21.2	7
over 20 years	24.2	8
not applicable	0.0	0

In Question 4, the panelists were asked to list their highest degree of education obtained. As expected, since most of the participants were faculty members of considerable experience at universities or colleges, the majority of respondents reported having doctoral degrees. Of the remaining respondents, most reported having earned a Master's degree, while none of the panelists reported having only an Associate's or a Bachelor's degree. As shown in Table 20, only one participant in Round 4 reported that an academic degree was not applicable in his/her case.

Table 20

Round 4 – Question 4 Results: Education Level

Q4. What is your highest level of education obtained? (N= 33)

Answer Options	Response Percent	Response Count
Associate Degree	0.0	0
Bachelor's Degree	0.0	0
Master's Degree	30.3	10
Doctoral Degree	66.7	22
None of the above	3.0	1

Question 5 from this round asked the participants if their institution offered a degree program in homeland security. Since the respondents in this Delphi survey were anonymous, the researcher's aim was not to compare one particular university's program with another, but merely attempted to ascertain if the panelists did in fact teach at an institution that offered a homeland security degree program. The largest response group

(49%) reported that their institution did offer a homeland security degree, while a smaller number of respondents (15%) indicated that their institution did not offer an HS degree. A significant number of panelists (27%) stated that their institution did offer a similar degree program, but it was not called a "homeland security" degree. Three participants reported that the question did not apply to them. Table 21 shows the results from Question 5.

Table 21

Round 4 – Question 5 Results: HS Degree Offered

Q5. Does your institution offer a degree program in Homeland Security (HS)? (N=33)

Answer Options	Response Percent	Response Count
Yes	48.5	16
No	15.2	9
Similar degree program offered, but not called HS	27.3	5
I do not teach in an academic institution	9.1	3

The Delphi panelists who responded "yes" to Question 5 were asked in Question 6 what level of degree in homeland security was awarded by their institution. Respondents were allowed to select multiple choices in this question. The largest number of respondents (62%) indicated that their institution offered a Master's degree in homeland security, while the next higher group (38%) reported offering a Bachelor's degree, and three panelists stated their institution offered an Associate's degree program. Interestingly, the outliers in this question were at each end of the academic spectrum. According to the remaining participants, their institution offered either a certificate program in homeland security, with only one respondent indicating that his/her institution

offered a doctoral degree in homeland security. The percentages of the responses for Round 4 – Question 5 are shown in Table 22.

Table 22

Round 4 – Question 6 Results: Level of HS Degree Offered

Q6. If the answer to question # 5 was "Yes", what level of HS degree is offered? (N = 33)

Answer Options	Response Percent	Response Count
Certificate	20.8	5
Associate	12.5	3
Bachelor's	37.5	9
Master's	62.5	15
Doctorate	4.2	1

Question 7 built upon the previous questions and asked of the participants who reported that their institution did offer a degree program in homeland security approximately how many students were currently enrolled as majors in the program. This question was posed to the Delphi panelists in order to determine the size of the student body pursuing degrees in the academic homeland security field at the survey population's institutions. Only 25 panelists responded to this question instead of the 33 that had provided input in the previous questions. While this is a snapshot in time of a relatively small population group, it does serve to establish a baseline of sorts, giving an indication of the popularity of homeland security among college students today. The results of Question 7 were interesting, in that the enrollment numbers were fairly evenly distributed among the participants that reported enrollments of HS majors at their institutions. Three panelists reported that the question did not apply to them. The percentages of participants reporting are shown in Table 23.

Table 23

Round 4 – Question 7 Results: HS Enrollments

Q7. If the answer to question # 5 was "Yes", approximately how many students are enrolled in your HS program as majors? (N = 25)

Answer Options	Response Percent	Response Count
1 – 30	28.0	7
31 – 69	20.0	5
70 – 100	12.0	3
over 100	28.0	7
not applicable	12.0	3

In Question 8, the participants that answered in Question 5 that their institutions provided similar but differently labeled degree programs were further requested to match the names of those similar programs from a list of four core course areas provided. The panelists were also offered the option to select "other" and then to list the names of those unique courses that did not fit into the four categories provided. Twenty of the Delphi panelists responded to this question as opposed to the 33 that had been responding previously throughout the Round 4. The results for Question 8 were also interesting, in that they showed a wide variety of course titles in a homeland security degree were being offered by the participating institutions, with the largest number of responses (50%) falling under the "other" category. Kiltz (2011) offered one frank explanation as to why such a large degree of variance exists in HS degree curricula, "To date, there is no agreed upon definition of homeland security; no grand theory explaining the phenomenon of homeland security; no standardized curriculum; little discussion of history, paradigms, and philosophies of the field; and ill-defined faculty roles" (p. 13).

Of the 10 respondents who selected the "other" category in this question, the list of courses that were offered by their institutions ran the gambit from National Security, Public Health, Security Policy Studies, Transportation Security, and Bio-defense, to National Security Affairs. Eight of the respondents felt that the question did not apply to them. Table 24 displays the results from Question 8.

Table 24

Round 4 – Question 8 Results: Similar HS Programs

Q8. If the answer to question # 5 was "Similar degree program, but not called Homeland Security", which title below best describes the degree program offered at your institution? (N = 20)

Answer Options	Response Percent	Response Count
Emergency Management	5	1
Criminal Justice/Law Enforcement	0	0
Public Administration/Political Science	5	1
Risk Analysis / Risk Management	0	0
Not applicable	40	8
Other (please specify below)	50	10

Question 9 sought to establish a timeline for future HS program development in the participating institutions. This information would be valuable in predicting the future popularity of HS programs among the survey population. While not a complete picture of HS program development across the country, the snapshot of data in Question 9 does give an indication of the potential growth of HS programs in U.S. colleges and universities. The 26 participants that did respond to this question stated overwhelmingly (almost 85%) that the question did not apply to their institutions, indicating that at least among the UAPI members participating in the survey there were no plans to offer a degree in HS. Whether that means there was no interest in having any HS degree

program at those institutions, or that the institutions were not planning on developing any new HS degree programs was inconclusive based on the response data. For the participants that did respond to the question by selecting a timeframe, the data indicate that popularity in HS degree programs in that the timeframe of one to three years for development was selected by four of the panelists. The results from Question 9 are depicted in Table 25.

Table 25

Round 4 – Question 9 Results: Future HS Course Offerings

Q9. If your institution has plans to offer a degree program in HS, within what timeframe will it be offered? (N = 26)

Answer Options	Response Percent	Response Count
Next year	3.8	1
1 – 3 years	11.5	3
4 – 6 years	0	0
7 – 10 years	0	0
Not applicable	84.6	22

Questions 10 – 33 in Round 4 utilized a 5-point Likert scale to rate the participants' opinions on a variety of topics concerning homeland security curricula development. The survey questions in this section employed a common 5-point Likert scale, with the choices ranging from: (a) *strongly disagree*, (b) *disagree*, (c) *neither agree or disagree*, (d) *agree*, or (e) *strongly agree* with the questions or statements posed. The Likert-scale used in Round 4's survey, also called a summative scale, was developed by Rensis Likert in 1932, and it requires the individuals to make a decision on their level of agreement, generally on a five-point scale associated with a statement. The number

beside each response becomes the value for that response and the total score is obtained by adding the values for each response (Page-Bucci, 2003). Maurer and Andrews (2000) suggested the Likert scale can be considered a measure of both magnitude and confidence, and they concluded, based on reliability, predictive validity, and factor analysis data, that a Likert scale measure of self-efficacy is an acceptable alternative to the traditional quantitative measure.

Debate rages among researchers about whether Likert scale data is ordinal or not and should be tested using parametric or nonparametric methodology (Clason & Dormody, 1994; Kislenko & Grevholm, 2008). According to (Mogey, 1999), once the data is obtained in a survey, Likert scale ordinal data can be analyzed using an appropriate nonparametric test, either a descriptive technique or an inferential technique. For the purposes of this study, the data obtained from the Round 4, 5-point Likert-scale survey was treated as ordinal data and was analyzed as such.

In Question 10 of this round, the participants were asked the first of the questions using the 5-point Likert scale. The question sought to survey the panelist's opinion on whether national accreditation was important for a homeland security degree curriculum. The responses were overwhelmingly in favor of national accreditation with 64% of the Delphi panelists choosing to agree or strongly agree. This response strengthens the researcher's opinion that an academic homeland security program should be accredited by a national body just as other academic disciplines such as engineering, medicine, or law. This conclusion regarding the need for accreditation is further reinforced by studies conducted by Foster & Plant (2010), France (2012), and Heyman & Carafano (2008). The results for Question 10 are displayed in Table 26.

Table 26

Round 4 – Question 10 Results: National Accreditation

Q10. A national accreditation body for Homeland Security (HS) curricula is necessary and important. (N = 33)

Answer Options	Response Percent	Response Count
Strongly disagree	21.2	7
Disagree	12.1	4
Neither Agree or Disagree	3.0	1
Agree	36.4	12
Strongly Agree	27.3	9

The next two questions elicited the participant's view on whether there should be some level of federal government oversight in either HS education in general or in curriculum development specifically. As noted in a report by the Center for Homeland Defense and Security (CHDS), as early as 2002, the U.S Department of Justice (DoJ) and the U.S Department of Defense (DoD), with the support of Congress, established the Center at the Naval Postgraduate School in Monterey, CA, which led to the development of the first post-9/11 homeland security graduate program (CHDS, n.d.). In addition, both the U.S. Federal Emergency Management Agency (FEMA) and the U. S. Department of Homeland Security (DHS) have made recommendations regarding a model curriculum for college-level homeland security programs (DHS, 2009b; FEMA, 2004). This is indicative of at least a tacit early partnership between academic homeland security and its counterparts within the federal agencies. While some degree of government oversight for a curriculum that deals with security of the U.S. homeland and its people may seem to be a reasonable idea, there are relevant concerns. Throughout the literature search for this study, a long history of concern was noted within academia

about possible alliances between higher education and the U.S. government, particularly the military and the intelligence agencies. The National Research Council in a report entitled *Frameworks for Higher Education in Homeland Security* voiced the following caution, "The Department of Homeland Security will need to secure public support for education in homeland security without allying itself so closely to homeland security programs that the agency and the educational objectives become intertwined in the public's perception (2006, p. 12). Based on the discussion above, the responses to Question 11 and 12 were not entirely unexpected, and were closely matched, with an average of 71% of the 33 panelists disagreeing or strongly disagreeing with the notion of federal oversight in homeland security education or curriculum. An average of 17% of the participants had no opinion on the issue, while 13% agreed with the idea. None of the panelists strongly agreed with the concept of federal oversight. The results from Questions 11 and 12 are shown in Table 27 and 28.

Table 27

Round 4 – Question 11 Results: Oversight of HS Education

Q11. Federal government agencies should have some type of oversight function regarding HS education. (N = 32)

Answer Options	Response Percent	Response Count
Strongly disagree	34.4	11
Disagree	37.5	12
Neither Agree or Disagree	15.6	5
Agree	12.5	4
Strongly Agree	0	0

Table 28

Round 4 – Question 12 Results: Oversight of Curriculum

Q12. Federal government agencies should have some type of oversight function regarding HS curriculum development. (N = 33)

Answer Options	Response Percent	Response Count
Strongly disagree	36.4	12
Disagree	33.3	11
Neither Agree or Disagree	18.2	6
Agree	12.1	4
Strongly Agree	0	0

In an effort to obtain the Delphi panelists' feedback on how the different elements of an HS curriculum should be weighted, the question was posed suggesting equal weighting among the 15 core academic areas (CAAs) established in Round 1. Nearly 79% of the participants responded against the idea, saying that they disagreed or strongly disagreed with equally weighted CAAs, with 12% indifferent, and only 9% agreeing with the notion. While the specific weighting of CAAs was not an element of this research project, the researcher felt it would be an interesting question to pose and may generate debate on the need for future study on the relative importance of different academic areas within an HS curriculum. Table 29 shows the results from Question 13.

Table 29

Round 4 – Question 13 Results: Weighting CAAs

Q13. All identified core academic areas (CAAs) of an HS curriculum should be accorded equal weight in a curriculum. (N = 33)

Answer Options	Response Percent	Response Count
Strongly disagree	12.1	4
Disagree	66.7	22

Answer Options	Response Percent	Response Count
Neither Agree or Disagree	12.1	4
Agree	6.1	2
Strongly Agree	3.0	1

Question 14 of Round 4 dealt with the respondents' opinion of the need to establish a standard definition for homeland security prior to developing a degree curriculum. Numerous studies have attempted to define that term, "homeland security", and the response range widely across the field (Bradshaw, 2011; Drabek, 2007; Kiltz, 2011; Polson et al., 2010). Bellavita (2011) stated that there are at least seven defensible definitions of homeland security, with one being stated in the *Quadrennial Homeland Security Review Report* (QHSR) of 2010, and others based on a variety of assumptions, assertions, and interests. This researcher was curious to see what the panel of 33 SMEs believed. According to the participants in this survey, almost 70% felt that there should be a consensual definition reached on the term "homeland security" before a standardized curriculum could be developed. The remaining 30% of the panelists were either indifferent or did not agree with that question. None of the 33 respondents strongly disagreed with the idea. The results from Question 14 are depicted in Table 30.

Round 4, Question 15 asked the panelists to rate the appropriateness of the Delphi technique in this research study. Katz (2004) stated that "the Delphi technique is recommended for program and curriculum development, particularly in emerging fields where there is no recognized standard for curriculum" (p. 49). One of the original goals of this research study was to vet the results of the most recent studies regarding HS curriculum development – particularly the ERAU study for reliability and validity.

Table 30

Round 4 – Question 14 Results: Defining HS

Q14. HS curriculum development should be based on a standard definition of what constitutes "homeland security. (N = 33)

Answer Options	Response Percent	Response Count
Strongly disagree	0	0
Disagree	15.2	5
Neither Agree or Disagree	15.2	5
Agree	54.5	18
Strongly Agree	15.2	5

One way to accomplish this particular goal was to ask the 33 members of this current study if they felt that the Delphi technique was an appropriate methodology to use in this project. A positive response would be treated as an affirmation of the Delphi technique in this application. The results from Question 15 are shown in Table 31. An overwhelming 94% of the panelists selected agree or strongly agree with the question. Only 6% were indifferent and no one said they disagreed or strongly disagreed with the Delphi methodology. Hence, the validity of the previously mentioned HS curriculum studies, including the ERAU study (Ramsay et al., 2010) was upheld by this research.

Similar to the query posed in Question 10, the panelists were asked in Question 16 if a national accrediting body should be involved in the development of a standardized homeland security curriculum. One of the methods to verify reliability in a Likert-scale survey is to ask similar questions, worded slightly differently, to determine if the same set of participants answer the subsequent question in the same manner as the earlier one (Kislenko & Grevholm, 2008). That was the intent of Question 16.

Table 31

Round 4 – Question 15 Results: Appropriateness of Delphi Study

Q15. The process of using subject-matter experts to choose the components of an HS curriculum by using an iterative, consensus-driven Delphi technique was appropriate for the research study in which you just participated. (N = 33)

Answer Options	Response Percent	Response Count
Strongly disagree	0	0
Disagree	0	0
Neither Agree or Disagree	6.1	2
Agree	60.6	20
Strongly Agree	33.3	11

Slightly over half (55%) of the respondents were in agreement with the statement, while 13% had no opinion or disagreed. This correlates with the results of Question 10, where a majority (64%) of the panelists agreed with national accreditation, and 33% disagreed. Only 31 participants, vice 33 as in previous questions, responded to Question 16, and the results are displayed in Table 32.

Table 32

Round 4 – Question 16 Results: Standardized Curriculum

Q16. HS curricula development should be accomplished under standardized criteria promulgated by a national accrediting body. (N = 31)

Answer Options	Response Percent	Response Count
Strongly disagree	12.9	4
Disagree	12.9	4
Neither Agree or Disagree	19.4	6
Agree	41.9	13
Strongly Agree	12.9	4

Question 17 asked the participants if a homeland security curriculum should contain a mix of conceptual and operational courses, or in other words, a balanced mix of

strategic versus tactical courses. Thirty-three panelists responded and reached a very high level of consensus (94%) on this element of a curriculum, with only 6% disagreeing. The results from Question 17 are displayed in Table 33.

Table 33

Round 4 – Question 17 Results: Conceptual vs. Operational

Q17. In order to ensure a comprehensive education, conceptual subject matter should be mixed with operational and/or tactical courses in an HS curriculum. (N = 33)

Answer Options	Response Percent	Response Count
Strongly disagree	0	0
Disagree	6.1	2
Neither Agree or Disagree	0	0
Agree	54.5	18
Strongly Agree	39.4	13

Questions 18 and 19 examined the concept of a wide and shallow HS curriculum versus a narrow and deep one. The point of this question was to attempt to validate the original premise of the ERAU study that an undergraduate degree in HS should offer a wide range of topics related to the field and not delve too deeply into specific course areas, as that should be reserved for graduate work. That was the way that the ERAU HS program fashioned their degree curriculum according to input from their virtual advisory panel (Ramsay et al., 2010). Questions 18 and 19, one the converse of the other, were posed to the panel and 33 participants provided input for each question. Again, the technique of similarly worded questions served to verify the responses of the panelists between these two questions. The results from the two questions indicated that a majority of the panelists (average of 61%) felt that an expansive variety of topics should be introduced in an undergraduate HS degree, while only 15% indicated that an HS

curriculum should be narrow and focused. The results for Questions 18 and 19 are shown in Tables 34 and 35.

Table 34

Round 4 – Question 18 Results: Wide and Shallow Curricula

Q18. HS undergraduate curricula should be wide and shallow – (i.e. cover a large variety of topics for a broad knowledge base).
(N = 33)

Answer Options	Response Percent	Response Count
Strongly disagree	3.0	1
Disagree	18.2	6
Neither Agree or Disagree	18.2	6
Agree	48.5	16
Strongly Agree	12.1	4

Table 35

Round 4 – Question 19 Results: Narrow and Deep Curricula

Q19. HS undergraduate curricula should be narrow and deep – (i.e. focus on specific areas in which to become expert. (N = 33)

Answer Options	Response Percent	Response Count
Strongly disagree	9.1	3
Disagree	48.5	16
Neither Agree or Disagree	27.3	9
Agree	9.1	3
Strongly Agree	6.1	2

One of the recurring questions that surfaced in the researcher's literature review for this study was, "*Is homeland security an established academic discipline*?" Some studies assert that is the case (Bellavita, 2008; Kiltz, 2011), while others take a more cautious approach (Drabek, 2007; NRC, 2006) and say that the field is still in the nascent

stage and must meet specific criteria to be labeled an established academic discipline such as engineering, medicine, or law. From the responses, the 33 participants were not overwhelming in their decisions but seemed to feel that HS is not yet an established academic discipline, with 43% disagreeing with the statement, 33% in agreement, and 21% indifferent. The results from Question 20 are shown in Table 36

Table 36

Round 4 – Question 20 Results: Established Discipline

Q20. HS is an established academic discipline. (N = 33)

Answer Options	Response Percent	Response Count
Strongly disagree	6.1	2
Disagree	36.4	12
Neither Agree or Disagree	21.2	7
Agree	33.3	11
Strongly Agree	3.0	1

Question 21 was basically a rewording of Question 17 which asked about the need for a mix of conceptual training and operationally oriented training. A significant 94% of the panelists responded in agreement with that statement posited in Question 17. Similarly, Question 21 asked about the balance of conceptual training versus training oriented subject matter, but specified for an undergraduate degree. The results were similar to those in Question 17; however, in this question the level of agreement while still in the majority, was lower with 70% of the participants agreeing with the statement.

The debate over training versus education in the field of academic homeland security has had vocal proponents on each side of the issue for years (Bellavita, 2006; Winegar, 2008). Some of those practitioners in homeland security, namely firefighters,

paramedics, law enforcement officers, etc. are required to complete rigorous and recurring training courses in order to accomplish their assigned duties. Conversely, HS professionals in the field of intelligence, management, policy-making, etc. are more likely to have earned some sort of college degree in the more formal venue of higher education. Each type of learning has its place in the diverse and dynamic field of homeland security, but the thrust of this research study was to develop an outcomes-based curriculum for homeland security more closely aligned with the paradigm of higher education. Therefore, since the Delphi panelists were predominantly faculty at colleges and universities (as derived from Round 4, Question 1), the results for Questions 17 and Question 21 (shown in Tables 33 and 37) were not surprising.

Question 22 sought to poll the participants for their opinion of whether an internship or co-operative program should be required at the undergraduate level for a degree in homeland security. The virtual advisory panel of the ERAU study (used as a baseline for this current project, stated unanimously that students graduating with a baccalaureate degree in homeland security should have some level of practical experience on their resume (Ramsay et al., 2010). Practical experience for undergraduates is generally obtained through a summer internship on a co-operative program. Thus, the reason for inclusion of Question 22 in the study. The participants seemed to agree, responding by a 79% margin that internships should be mandatory in an HS degree. Twenty-one percent of panelists had no opinion, and interestingly, not one of the 33 participants disagreed with the internship requirement.

Table 37

Round 4 – Question 22 Results: Conceptual vs. Training

Q21. It is important that an HS curriculum at the undergraduate level emphasize conceptual thinking over more training oriented subjects. (N = 33)

Answer Options	Response Percent	Response Count
Strongly disagree	6.1	2
Disagree	12.1	4
Neither Agree or Disagree	12.1	4
Agree	54.5	18
Strongly Agree	15.2	5

Table 38

Round 4 – Question 22 Results: Co-op or Internship

Q22. An undergraduate degree in HS should require at least one internship or co-op program prior to graduation. (N = 33)

Answer Options	Response Percent	Response Count
Strongly disagree	0	0
Disagree	0	0
Neither Agree or Disagree	21.2	7
Agree	39.4	13
Strongly Agree	39.4	13

As the English poet John Donne remarked, "No man is an island, entire of itself" (Parker, 1839). This quotation aptly applies today in that homeland security cannot be a purview of a single nation, but because of international alliances and adversaries, must include global policies and strategies. A graduate of a homeland security program should have fluency in a foreign language, and posited that sentiment to the Delphi panel in this question. The participants were almost equally mixed in their responses, with 34% in disagreement, 38% in agreement, and 28% having no opinion.

Next, question 24, asked in the foreign language required for an HS graduate should be tied to one of the strategic languages identified by the U.S. State Department's

National Security Language Initiative (NSLI) such as Arabic, Chinese, Russian, and Farsi (DOS, n.d.). The results from this follow-up question showed that the 32 respondents (one member abstained) were similarly split on the issue of foreign language, with 38% disagreeing, 34% agreeing, and 28% having no opinion. The results for Questions 23 and 24 are shown in Tables 39 and 40.

Table 39

Round 4 – Question 23 Results: Foreign Languages

Q23. A foreign language course should be required for an undergraduate degree in HS. (N = 32)

Answer Options	Response Percent	Response Count
Strongly disagree	3.1	1
Disagree	31.3	10
Neither Agree or Disagree	28.1	9
Agree	28.1	9
Strongly Agree	9.4	3

Table 40

Round 4 – Question 24 Results: Type of Foreign Language

Q24. Any required foreign language required for an HS curriculum should have a direct connection with current HS-related issues – (i.e. Chinese, Arabic, Farsi, etc.). (N = 33)

Answer Options	Response Percent	Response Count
Strongly disagree	6.1	2
Disagree	30.3	10
Neither Agree or Disagree	21.2	7
Agree	30.3	10
Strongly Agree	12.1	4

Question 25 surveyed the panelists on the potential requirement of a capstone project for an undergraduate homeland security degree program. Many academic programs require a culmination event, or capstone project, in a baccalaureate program. Capstone projects are a way to organize teaching and learning around authentic student projects integrating technical and academic disciplines. Professors facilitate connections between academic and technical coursework and challenge students to use knowledge and skills obtained throughout the course of study to solve real-world problems related to their chosen careers (Savagian, 2009). Through an on-line survey, the ERAU researchers determined that a capstone project was highly favored by their virtual advisory board, and made that feature a degree requirement. ERAU homeland security majors are guided in the selection of a local client for which they perform such hands-on projects as security vulnerability assessments, business continuity plans, and emergency management plans (Ramsay et al., 2010). This researcher also felt that a capstone project would enhance a student's over comprehension and application of educational concepts learned during the formal degree process. The Delphi panelists apparently agreed, with 82% of the participants responding favorably to the idea of a capstone project. The results for Question 25 are depicted in Table 41.

Table 41

Round 4 – Question 25 Results: Capstone Project

Q25. The undergraduate degree in HS should require a culminating event (e.g. capstone project). (N = 33)

Answer Options	Response Percent	Response Count
Strongly disagree	0	0
Disagree	6.1	2

Answer Options	Response Percent	Response Count
Neither Agree or Disagree	12.1	4
Agree	51.5	17
Strongly Agree	30.3	10

In Question 26, the panelists were asked if a thesis should be required in an HS undergraduate degree curriculum. As with the capstone initiative in the preceding question, a majority of participants (74%) felt that a thesis should be a degree requirement, while only 7% were in disagreement. The results are shown in Table 42.

Table 42

Round 4 – Question 26 Results: Thesis

Q26. The graduate degree in HS should require a thesis. (N = 31)

Answer Options	Response Percent	Response Count
Strongly disagree	0	0
Disagree	6.5	2
Neither Agree or Disagree	19.4	6
Agree	41.9	13
Strongly Agree	32.3	10

In Question 27 the issue of a test-out option was raised. In most curricula, it is recognized that certain students may not be able to complete a thesis for a variety of reasons such as scheduling issues, poor GPA, etc. Therefore, an option to take a comprehensive examination in lieu of a thesis is often offered by institutions. The Delphi panelists in this study did not agree with that particular option, with 48% not in favor, 29% in favor, and 23% having no opinion on the option of a comprehensive exam versus a thesis. Table 43 depicts the results for Question 27.

Table 43

Round 4 – Question 27 Results: Test-out Option

Q27. The graduate degree in HS should have a comprehensive test-out option in lieu of a thesis. (N = 31)

Answer Options	Response Percent	Response Count
Strongly disagree	12.9	4
Disagree	35.5	11
Neither Agree or Disagree	22.6	7
Agree	25.8	8
Strongly Agree	3.2	1

As in the previous Question 17 and 21, the idea of training versus education was explored with slightly reworded question in number 28 and 29. Why is this issue important enough to ask survey questions more than once? Drabek (2007) reported that the field of emergency management, a key element in homeland security, did not begin to develop a formal academic education program in the field until 1996. Prior to that time, emergency management training was just that – operational, tactical training courses to certify that a person had the technical skills and physical abilities to accomplish a specific set of tasks. Dilling (2008), stated, "More recently, the increasing numbers of academic programs have tilted the balance away from specialized training to academic preparation (p. 15). This researcher agrees, and wanted to gain the perspective on the issue in regards to an Associate's degree program. Overall, the panelists were split on this issue, with 41% agreeing, 38% disagreeing, and 23% having no opinion. To the researcher, this indicates that the results are inconclusive and that there is no clear preference on training versus education at the Associate's degree level. The results for Question 28 may be seen in Table 44.

Table 44

Round 4 – Question 28 Results: Training vs. Education

Q28. An associate's degree in HS should contain more training than education. (N = 32)

Answer Options	Response Percent	Response Count
Strongly disagree	6.3	2
Disagree	31.3	10
Neither Agree or Disagree	21.9	7
Agree	34.4	11
Strongly Agree	6.3	2

Soon after the attacks of 9/11, the debate over the difference between homeland security and homeland defense began to heat up. Prior to 9/11, the issue was rather clear cut. Homeland defense was a military purview, under the Department of Defense, while homeland security (at that time called civil defense of disaster management) was the responsibility of FEMA and a handful of other government agencies (Garamone, n.d.). Interestingly, the first professional organization to examine the need for a standardized curriculum in the field of academic homeland security was the Center for Homeland Defense and Security (CHDS) at the Naval Postgraduate School and its follow-on organization, the Homeland Security and Defense Education Consortium (HSDEC), both of which had clear ties to homeland defense (CHDS, n.d.). The Delphi panelists in this study were asked in homeland security and homeland defense were the same thing, and their response indicated a strong feeling (75%) that the two topics were not the same. A total of 29% felt the topics were the same, while only 6% were indifferent. To this researcher, the data on this question are clear – HS SMEs do not believe that homeland security and homeland defense are the same. See results for Question 29 in Table 45.

Table 45

Round 4 – Question 29 Results: HS Equals HD

Q29. Homeland Security is the same as Homeland Defense. (N = 32)

Answer Options	Response Percent	Response Count
Strongly disagree	34.4	11
Disagree	40.6	13
Neither Agree or Disagree	6.3	2
Agree	12.5	4
Strongly Agree	6.3	2

In Question 30, the researcher explored the panelist's opinion on whether a degree in homeland security was the same as older, more established degree programs such as criminal justice, law enforcement, or emergency management. The response, shown in Table 46, was overwhelmingly in disagreement with the statement in this question, with 97% of the participants disagreeing. Only 3% had no opinion, and no one agreed with the statement. To this researcher, these responses are evident that even if it is a nascent, emerging field of study, homeland security is viewed as a separate discipline than its earlier counterparts, at least by the Delphi panelists in this study. This data corresponds with studies by Kiltz (2011) and France (2012).

Question 31 asked whether the Delphi panel believed an outcome-based education (OBE) model should be used to measure mastery of the KSAs a homeland security graduate should attain. This was an attempt to discern how the Delphi panelists felt about the efficacy of OBE. The participants responded with a resounding yes (97% agreement – the highest level of agreement in Round 4). Since one of the researcher's main goals in this study is the development of an HS curriculum that can measure the outcomes of the

PSOs that were developed, the response to this question seems to validate that idea. The results from Question 31 are displayed in Table 47.

Table 46

Round 4 – Question 30 Results: HS vs. CJ, LE, or EM

Q30. A degree in criminal justice, law enforcement, or emergency management is the same as a degree in homeland security. (N = 27)

Answer Options	Response Percent	Response Count
Strongly disagree	27.3	3
Disagree	69.7	23
Neither Agree or Disagree	3.0	1
Agree	0	0
Strongly Agree	0	0

Question 32 asked if the Delphi panel valued a pre-test and post-test to evaluate student knowledge gained throughout the course. In their papers on outcomes-based education (OBE), DeJager and Nieuwenhuis (2005), and Killen (2000) mentioned the value of a pre-test and a post-test in terms of validity to ensure the outcomes that were slated to be measured actually were measured.

Table 47

Round 4 – Question 31 Results: Outcomes-Based Criteria

Q31. The knowledge, skills, and abilities (KSAs) that HS graduates accumulate should be tied to measurable, outcomes-based criteria. (N = 33)

Answer Options	Response Percent	Response Count
Strongly disagree	0	0
Disagree	3.0	1
Neither Agree or Disagree	0	0
Agree	75.8	25
Strongly Agree	21.2	7

By a small majority (59%), the respondents in this study agreed that pre-tests and post-test brought value to an HS curriculum and that they would use them, while only 13% disagreed. A significant percentage of panelists (28%) had no opinion regarding the topic. The results of Question 32 are shown in Table 48.

Table 48

Round 4 – Question 32 Results: Pre-test and Post-Test

Q32. I would consider using a retrospective pre-test and post-test to help assess the knowledge gained by the students and the degree of "value-added" by an HS course. (N = 32)

Answer Options	Response Percent	Response Count
Strongly disagree	3.1	1
Disagree	9.4	3
Neither Agree or Disagree	28.1	9
Agree	50.0	16
Strongly Agree	9.4	3

Question 33 was the final 5-point Likert scale question in the survey, and it as a culminating point, asked the Delphi panelists if they thought the research study they participated in had helped them as faculty identify the elements that should comprise an undergraduate degree curriculum in HS. Here the researcher strove to validate the overall efficacy of the study in terms of perceived usefulness to the UAPI participants. Based on the Delphi panelists' answers, it appears a large majority of them (79%) did agree that the study was ultimately useful in the curriculum development process. Only 3.0% disagreed with the statement, while 18% had no opinion either positive or negative. All 33 members of the panel that started in Round 4 answered this final Likert-scale question. The results for Question 33 are listed in Table 49.

Table 49

Round 4 – Question 33 Results: Survey Satisfaction

Q33. Participation in this study has helped me identify the elements that I feel should go into the design and development of an HS degree curriculum. (N = 33)

Answer Options	Response Percent	Response Count
Strongly disagree	0	0
Disagree	3.0	1
Neither Agree or Disagree	18.2	6
Agree	60.6	20
Strongly Agree	18.2	6

The final three questions in Round 4 did not use the 5-point Likert scale. Instead, they used a ranking structure, based on a scale of 1 to 5, with 1 being lowest importance and 5 being highest importance. The panelists were asked to rank in priority a list of potential subject matter areas that might be offered in a homeland security degree program. These elements, listed in no particular order were: (a) Concentrate on survey courses in as many different HS areas as possible, (b) Specialize in one area (e.g., criminal justice, emergency management, strategy and policy, etc.), (c) Identify areas of importance in accordance with job possibilities, (d) Teach to the operational, tactically-oriented level, and (e) Teach at the strategic, policy, and legal issue level. The same five elements were listed in each of the final three questions; however, the participants were asked to apply their rank ordering based on the curriculum for an Associate's degree, a Bachelor's degree, and a Master's degree, respectively. The purpose of these final questions was to survey the Delphi panelists to ascertain if their responses showed any significant differences between the academic elements of the three degree levels. The researcher believed the data would show a measurable difference, with more broad-based

subject matter in the lower degrees, and more strategic critical thinking in the post graduate degree. The results on these three questions were interesting; with the ordering of the five subject matter areas coming out exactly the same for an Associate's degree and a Baccalaureate degree. The graduate-level degree did have a different ordering of the subject matter areas, which was to be expected. However, the striking similarity between the ranking of the curriculum elements in the Associate's and bachelor's degree program was surprising to this researcher. It appears that at least among the population of UAPI membership that completed the survey, there was little perceived difference between subject matter areas. The results from Question 34, 35, and 36 are shown in Figures 2, 3, and 4.

Further, a nonparametric analysis was conducted on the data collected in Questions 10 – 33 (the 5-point Likert scale), and the mean for each question was calculated using the sum of weighted responses for the five categories (strongly disagree = 1; disagree = 2; neither agree or disagree = 3; agree = 4; and strongly agree = 5). The weighted response was then divided by the total response count of participants for each question (N). The purpose of this calculation was to determine which of the 24 Likert scale questions achieved an overall positive or negative score, based on the mean for that question being 3.0 or greater. Overall, the majority (66.7%) of the Likert scale questions regarding homeland security curriculum issues received a positive rating above a mean of 3.0 from the Delphi panelists, while 33.3% of Questions 10 – 33 received a negative rating (below a mean of 3.0) from the participants.

R4-Q34. Given the multitude of subject matter areas that might realistically be included in an HS curricula, how might an **Associate-level degree** capture the correct areas of importance; with 1 = lowest, and 5 = highest level of importance.

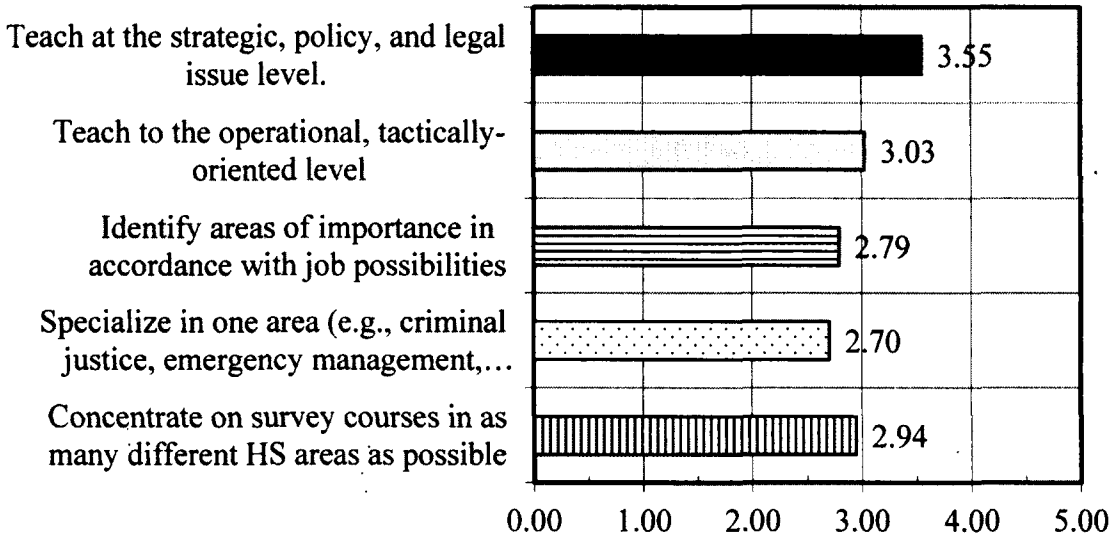

Figure 2. Ranking of associate-level HS subject matter areas (N = 33).

R4-Q35. Given the multitude of subject matter areas that might realistically be included in an HS curricula, how might an **Undergraduate-level degree** capture the correct areas of importance; with 1 = lowest, and 5 = highest level of importance.

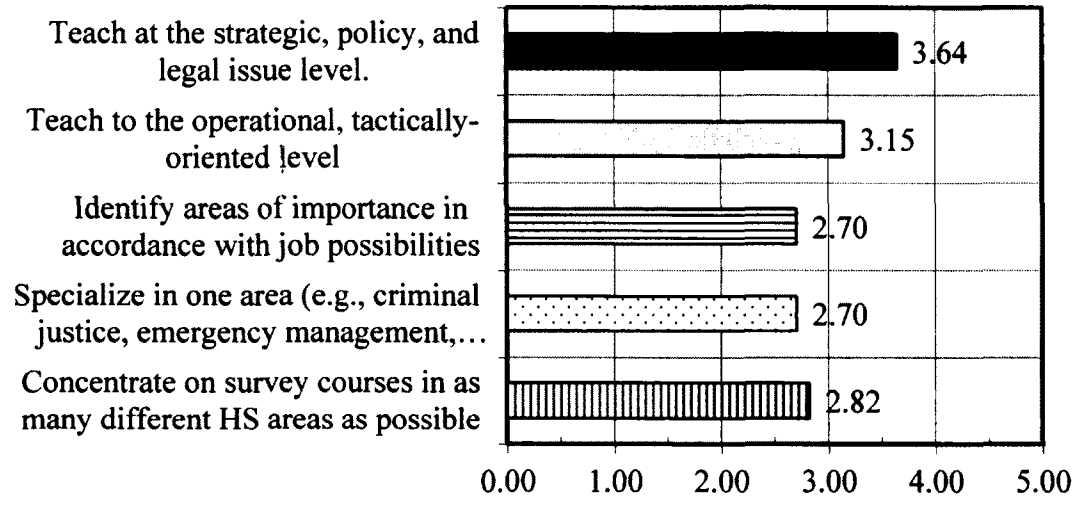

Figure 3. Ranking of undergraduate-level HS subject matter areas. (N = 33).

R4-Q36. Given the multitude of subject matter areas that might realistically be included in an HS curricula, how might a **Graduate-level degree** capture the correct areas of importance; with 1 = lowest, and 5 = highest level of importance.

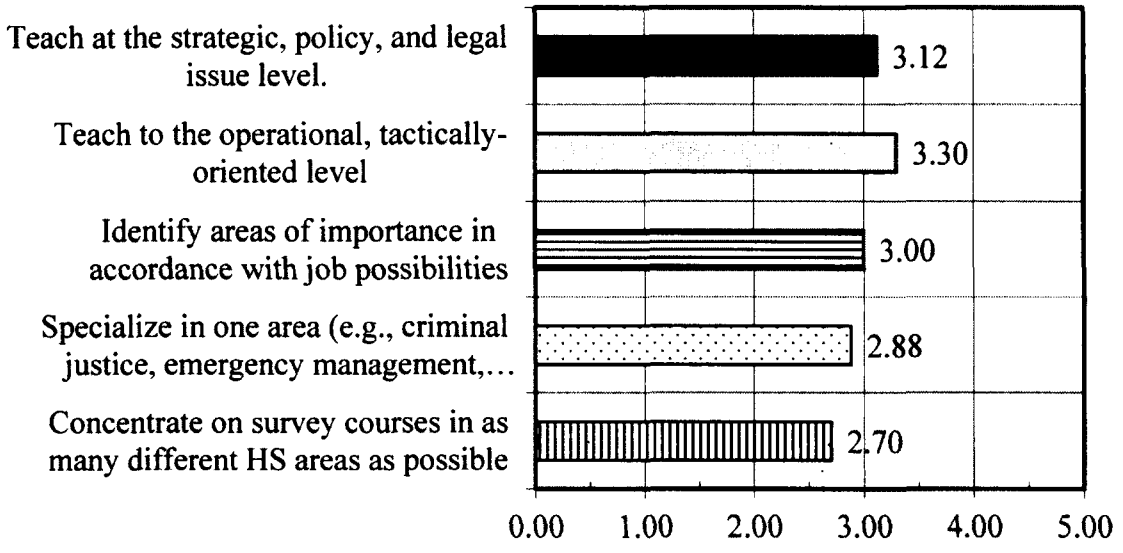

Figure 4. Ranking of graduate-level HS subject matter areas (N = 33).

Interestingly, the questions receiving the highest mean score (above 4.0) dealt with (a) the appropriateness of using the Delphi technique to arrive at a consensus of measurable outcomes for an HS curriculum; (b) the inclusion of a comprehensive mix of conceptual and operational courses in an HS curriculum; (c) the idea that an undergraduate HS degree should incorporate a capstone project and an internship; (d) and finally, that an HS degree should include a set of KSAs that are both measurable and outcomes based. Conversely, the questions that received the lowest mean scores (below 2.5) dealt with (a) the idea that the Federal government should have some type of oversight into HS education and curriculum development; (b) the idea that all CAAs should be equally weighted in an HS curriculum; (c) the statement that homeland security id the same thing as homeland defense; and lastly, (d) that a degree in criminal justice,

law enforcement, or emergency management was the same thing as a degree in homeland security. The responses to Questions 10 – 33 from this survey's population of HS SMEs indicates the practitioners in academic homeland security prefer to develop curricula (e.g. culminating events, measurable outcomes, and a blend of conceptual plus tactical course material) without oversight from the Federal government. Additionally, the panelists were strong in their convictions that homeland security was not the same as homeland defense, criminal justice, law enforcement, or emergency management. Lastly, as the researcher hoped to confirm, the panelist agreed overwhelmingly (mean of 4.27) that the use of the Delphi technique to achieve consensus on the elements of an outcomes based HS curriculum was the appropriate methodology for such a study. The full results of the analysis are shown in Table 50.

Table 50

Mean of 5-point Likert scale Questions (# 10 – 33)

Q #	N	SD	D	NAD	A	SA	Mean
10	33	7	8	3	48	45	3.36
11	32	11	24	15	16	0	2.06
12	33	12	22	18	16	0	2.06
13	33	4	44	12	8	5	2.21
14	33	0	10	15	72	25	3.70
15	33	0	0	6	80	55	4.27
16	31	0	8	18	52	20	3.16
17	33	0	4	0	72	65	4.27
18	33	1	12	18	64	20	3.48
19	33	3	32	27	12	10	2.55
20	33	2	24	21	44	5	2.91
21	33	2	8	12	72	25	3.61
22	33	0	0	21	52	65	4.18
23	32	1	20	27	36	15	3.09
24	33	2	20	21	40	20	3.12
25	33	0	4	12	68	50	4.06

Q #	N	SD	D	NAD	A	SA	Mean
26	31	0	4	18	52	50	4.00
27	31	4	22	21	32	5	2.71
28	32	2	20	21	44	10	3.03
29	32	11	24	6	12	10	1.97
30	27	9	46	3	0	0	2.15
31	33	0	2	0	100	35	4.15
32	32	1	6	27	64	15	3.53
33	33	0	2	18	80	30	3.94

Note: The five categories of the Likert scale used in these questions were: strongly disagree (SD); disagree (D); neither agree or disagree (NAD); agree (A); and strongly agree (SA), with N = total number of responses for that specific question.

Evaluation of Findings

The findings in this study reflect information gathered from a panel of subject matter experts from the University and Agency Partnership Initiative (UAPI) regarding development of an outcomes-based undergraduate degree curriculum in homeland security. The framework of this research project was a case study based on earlier work performed in conjunction with studies on the development on an HS curriculum (Bradshaw 2011, France, 2012, Ramirez & Rioux, 2012, Winegar, 2008), and particularly research done by Embry-Riddle Aeronautical University on developing an outcomes-based HS curriculum using the Delphi technique (Ramsay et al., 2010). Three areas of a curriculum were explored in the study; (a) core academic areas (CAAs), (b) overarching program objectives (OPOs), and (c) program specific objectives (PSOs). According to information gathered during the literature review conducted for the study, an outcomes-based curriculum was deemed important in being able to measure the extent to which students mastered the necessary knowledge, skills, and abilities (KSAs) of the curriculum (Dryer, 2001; Ho et al., 2009; and Stiehl & Lewchuk, 2009). One of the most important elements of outcomes-based education is the ability to measure the student's successful

completion of the learning objective. In order to meet that requirement, the researcher ensured that all of the outcomes and objectives generated by the research study were tied to the rubric used in Bloom's taxonomy, which pairs action verbs with each level of cognitive learning (Orlich et al., 2010). In fact, reaching 75% agreement among the panelists on the correct action verb to associate with each learning outcome/objective became a critical part of each Delphi round.

As stated, the Delphi technique was used as a research methodology because this technique is the most suitable for collecting and analyzing data gathered from subject matter experts using iterative rounds combined with feedback to reach consensus (Holey et al., 2007; Linstone & Turnoff, 2002). The researcher used a commercial software program, *SurveyMonkey*® to gather and compile the data, which assured a high degree of accuracy to preserve validity and reliability of the study, a required element per Hatcher and Colton (2007). Also, the use of *SurveyMonkey*® provided the participants with anonymity, an essential facet of the Delphi technique (Gordon, 1994). The purposive sample of 338 UAPI members resulted in an average per-round response rate of 40 participants throughout the Delphi process, which is a typical response rate for an on-line survey (von der Gracht, 2008). Four iterative rounds were employed to achieve a 75% degree of consensus among the participants on the specific elements that should comprise a baccalaureate curriculum in homeland security.

The first round of the survey concentrated on establishing a set of CAAs, or major functional homeland security topic areas which correspond to an extant academic discipline. In Round 1, the panelists began with a list of 40 CAAs (10 from the earlier ERAU study and 30 submitted by the members of the current study) which was then

narrowed down through three iterations to a final list of 15 CAAs. This final set of core academic areas included:

- All Hazards Threats Critical Analysis.
- Critical Infrastructure.
- Cyber Security – Information Security;
- Disaster Response, Recovery, and Society.
- Emergency Management.
- Ethics, Integrity, and Leadership.
- Fundamentals of Homeland Security Management;
- Homeland Security Policy Studies and Analysis.
- Interagency Coordination, Support, and Relations.
- Intelligence Studies.
- Law and Policy.
- Risk Analysis / Management.
- Strategic Planning.
- Terrorism Studies.
- Weapons of Mass Destruction.

The findings from this round of the survey instrument were comparable to those from the ERAU study (Ramsay et al., 2010) and with subsequent studies that explored a similar topic (Bradshaw, 2011; France, 2012; Kiltz, 2011; Ramirez & Rioux, 2012; and Winegar, 2008), in that a set of high-level, essential topic areas were developed using a survey of HS subject matter experts. However, in the current study, the researcher chose to delve deeper into curriculum development and ask the Delphi panelists to arrive at not only a basic list of core academic areas, but to also develop a more inclusive and comprehensive list of accompanying program specific objectives to flesh out a complete HS curriculum for an undergraduate degree. The Delphi technique worked well in this

study, and using a combination of text analysis provided by the *SurveyMonkey*® software and deletion of duplicate entries, the researcher was able to compile a list of proposed outcome-based CAAs in Round 1. The final list of 15 CAAs from Round 1 is shown in Table 51.

In Round 2, the Delphi panelists were asked to develop a list of overarching program objectives (OPOs) that are essentially general education requirements - something that all HS students should be able to accomplish or demonstrate - that do not necessarily or conveniently fall under an extant core academic areas (CAAs). Via a series of multiple iterations, the panelists were able to reach consensus on eight OPOs that should be included in an HS curriculum. The resulting list of eight OPOs agreed upon in Round 2 is shown in Table 52.

The third round of the study was designed to elicit responses from the Delphi panelists regarding what particular program specific objectives (PSOs) should accompany each of the 15 CAAs developed during Round 1. This round was perhaps one of the most critical in that this is where the current study went into more detail than any of the previous studies found in the literature review. Bradshaw, 2011; France, 2012; Ramirez & Rioux, 2012, and Winegar, 2008 all published recent studies where surveys of SMEs arrived at lists of what they termed subject areas, key courses, core areas, or topical area that would comprise a HS curriculum. However, these studies stopped short of developing a set of program-specific objectives to accompany the core subject areas suggested. Only the ERAU study (Ramsay et al., 2010), on which this researcher's project is primarily based, penetrated to the level of program objectives (what was termed associated student learning outcomes), but this was accomplished using a small survey

population (N=8); while the current study surveyed a population of SMEs approximately five times larger (average N = 40).

An initial list of 60 PSOs (45 suggested by the researcher from a study of literature, college syllabi, and a survey of ERAU students, and 15 new PSOs suggested by the Delphi panelists), were worked through three iterations in Round 3 and narrowed down to a list of 50 final PSOs to accompany the 15 CAAs established in Round 1. These 50 PSOs, having achieved a 75% consensus among the Delphi participants, also incorporated the same rubric of action verbs specified in Bloom's taxonomy to better describe the level of student learning expected in each objective. The final list of 50 PSOs is shown in Table 51.

Finally, in the Fourth Round of the study, the Delphi panelists were given a survey regarding demographic data and information on select HS curriculum issues. Questions 1 – 9 concerned demographic data and established the profession, experience, and expertise of the panelists. Questions 10 – 33, employed a standard 5-point Likert scale (*strongly disagree*, *disagree*, *neither agree or disagree*, *agree*, and *strongly agree*) to gage the participants responses to a set of HS curriculum development topics. The responses were tabulated using the spreadsheet feature of *SurveyMonkey*®, and depicted as Tables 17 – 49 in the study. The last three questions in Round 4, 33 – 36, asked the panelists to rank order five suggested subject areas in an Associates, Bachelor's , and Master's degree program in HS to ascertain if there was a difference among the SMEs on this issue. The results of the data from Questions 11 – 33 and the calculated the mean for each question, indicating the overall agreement or disagreement on the topics raised are shown in Table 50.

Summary

According to Pelfry & Pelfry, 2009, "In order for the topic of homeland security to develop into a formal discipline, a viable model of curricula that can be tested, refined, and implemented is required" (p. 60). That is exactly the problem this research study examined. Chapter 4 listed the findings of a four-round Delphi methodology used to survey a panel of subject matter experts (SMEs) in the field of academic homeland security. Using an iterative Delphi process to reach consensus, the researcher guided a panel of subject matter experts (SMEs) through a series of rounds and iterations to determine what elements an outcomes-based curriculum in homeland security should contain. The initial, potential survey population consisted of the 338 membership of the University and Agency Partnership Initiative (UAPI), a professional organization of faculty members and government executives involved with academic homeland security. While each member of UAPI was invited to participate in the research survey, only a small percentage responded. This number equated to a 12% rate of return from the UAPI membership, and according to Dennington (2004), is in line with the average rate of response (10-15%) for an online survey. During subsequent rounds, the number of participants in the study declined slightly, as is customary in the Delphi process, and stabilized at an average of 40 respondents per round for the duration of the project's iterations. This dropout rate corresponds with that of typical Delphi studies, which according to von der Gracht (2008) is in the range of 20-30 per cent.

Over the four rounds of the survey, the panel was asked to agree upon a list of core academic areas (CAAs), overarching program outcomes (OPOs), and program specific objectives (PSOs) that should constitute an undergraduate curriculum in

homeland security. Data obtained from the Delphi survey served to answer the study's three research questions regarding HS academic program development and led to the development of the proposed curriculum described in Chapter 5.

At the conclusion of the three iterations of Round 1, a list of 15 CAAs was finalized which would make up the key subject matter areas for an undergraduate curriculum in homeland security. At the conclusion of the five iterations of Round 2, a list of eight OPOs was finalized and included in the proposed curriculum. In Round 3, through a series of three iterations, the panelists were able agree upon a list of 50 PSOs to accompany the CAAs. Finally, in the single iteration of Round 4, a survey with demographic questions, 5-point Likert scale questions, and numerical ranking questions was distributed to the Delphi panelists in order to gage their opinion on a series of issues regarding academic homeland security. The Likert-scale data were analyzed as ordinal data and compiled in a series of tables, computing average responses for agreement or disagreement with the specific questions. The final three questions concerned the rank ordering of subject matter areas in Associate, Bachelor, and Master's degree curriculum in homeland security. All data collected were depicted in a series of tables and figures throughout Chapter 4.

Overall, the most significant findings from this study were the validation of the earlier studies' methodology and results (Bradshaw, 2011; France, 2012; Ramirez & Rioux, 2012, Ramsay et al., 2010, and Winegar, 2008), and the development of a comprehensive outcomes-based curriculum for an undergraduate degree program in homeland security. The proposed curriculum posited by this study could be considered a standardized model, and therefore could be adopted and then modified as necessary by

any institution of higher learning. The proposed curriculum is aligned with the proven accreditation model utilized by the Accrediting Body for Engineering and Technology (ABET, Inc.), the largest, most established accrediting body in the United States, and is thereby an exemplar for eventual accreditation of a university's HS program by a national body (ABET, 2008).

Chapter 5: Implications, Recommendations, and Conclusions

The problem addressed in this study is the lack of generally accepted or peer-reviewed program-level, learning-based outcomes that define a bachelor's degree in homeland security. Institutions of higher learning and training facilities have been instructing students in subjects pertaining to homeland defense, civil defense, disaster response, and emergency management for decades before the fateful incident on September 11, 2001 (NRC, 2006). However, it is only since 9/11 that a national strategy and policy for homeland security has begun to take shape in this country. As the nation's awareness of emerging homeland security issues grew, so did the need for a cadre of well trained professionals able to adapt and overcome the ever-changing level of threats of the 21st century's war on terrorism. Training that new generation of homeland security practitioners is the job of academia, and many universities around the country have initiated degree programs in homeland security since 9/11. However, there is no standardized curricula, no overarching accrediting body to validate existing homeland security education programs offered across the country (Forster & Plant, 2010; Moore et al., 2010; Ramsay et al., 2010). The presumption with such outcomes-based accreditation in higher education is that it is a powerful means of ensuring degree integrity and quality (Harden, Crosby, & Davis, 1999).

The research questions guiding this study were:

Q1: What core academic areas (CAAs), overarching program objectives (OPOs), and program-specific objectives (PSOs) should comprise an undergraduate degree in homeland security?

Q2: What areas of overlap exist between this study's final set of CAAs, OPOs,

and PSOs and those developed by earlier studies, particularly the Ramsay, Cutrer, and Raffel (2010) study?

Q3: What additional elements are of importance to the academic field regarding the development of an HS degree program?

An initial study was completed by Ramsay, Cutrer, and Raffel (2010) at Embry-Riddle Aeronautical University (ERAU) from 2007-2008, which surveyed a small panel of HS experts to help identify a list of the knowledge, skills, and abilities that HS majors should attain upon graduation. While that initial study was valuable, the size of the sample population used (N = 8) was statistically too small to produce conclusive results. Therefore, this research project was designed as a qualitative case study to build upon and validate that initial ERAU study by surveying a larger population of homeland security experts. The researcher chose to use the 2010 membership of the University and Agency Partnership Initiative (UAPI) membership (N = 338) as the survey group to validate via consensus the program-level outcomes an HS graduate should possess. The UAPI membership represents a population of subject matter experts in the field of academic homeland security (CHDS, n.d.). The results of this research study can be employed by any institution that wants to develop an outcomes-based HS degree program with a concurrent goal of national accreditation.

Therefore, the purpose of this qualitative research was to identify a set of program-level, learning-based outcomes for an undergraduate degree in homeland security using a case study approach that builds upon the initial, Delphi technique employed by Ramsay et al. (2010). A case study methodology was used culminating in an iterative, consensus-driven survey distributed to a purposive convenience sample of

homeland security experts to ascertain their ideas on what elements (i.e., knowledge, skills, and abilities) should comprise an undergraduate degree in HS. In addition, a 5-point Likert scale survey was promulgated to gage the respondents' preferences on other elements involving an HS degree, including the relative importance of specific curricula objectives in an Associate's, Bachelor's, or Master's degree program in HS.

Both reliability and validity were concerns during this study. Since this research project is a follow-up to the initial study done by the ERAU HS faculty, the assumption was made that the methodology used in that first study by ERAU was valid. This assumption was made by virtue of the exhaustive literature review conducted in Chapter 2 on the merits and methodology of the Delphi process, to which the ERAU study clearly conformed. According to Gay and Airasian (2000), "reliability is the degree to which a test consistently measures whatever it is measuring" (p. 169). Construct validity is defined by Shank (2006) as "the notion that what you say you have observed is, in fact, what really happened" (p. 111). Hence, a primary outcome of this study was to validate the earlier ERAU study among a larger survey population of UAPI members, by using a similar research protocol (Delphi technique, on-line survey, and consensus-building regarding curriculum outcomes), to achieve both validity and reliability.

This study has several limitations. A limiting factor is the sheer number of HS practitioners in this country and abroad. Because of this, a survey could not be sent to every homeland security professional responsible for determining what skills, knowledge, and abilities were required of newly hired personnel. The numbers involved would be beyond the practical scope of work for the researcher due to financial and time constraints. Therefore, the researcher decided upon a two-pronged approach of intently

examining what the earlier study by Ramsay et al. (2010) already accomplished and using the results of that study as a springboard to survey a larger population to determine appropriate program-level outcomes for an HS baccalaureate degree curriculum.

Another limitation was the use of the Delphi technique itself. The basic methodology of a Delphi panel requires iteration and consensus over a sustained period of time (Linstone & Turnoff, 2002). While this extended time period can actually assist the researcher in synthesizing the iterative results between each round, the time involved can become a limiting factor to the panel participants. Consequently, the consensus development process can be sufficiently lengthy as to result in attrition and unresponsiveness of members due to normal work related factors. This attrition among panelists was noted in the findings in Chapter 4.

This study also faced the self-imposed limitations of sampling size. Even though this study initially sampled a much larger population than the initial ERAU study it was modeled after (Ramsay et al., 2010), it will not be a random sampling, but more of a convenience sampling, since the population surveyed consisted of the members belonging to a specific professional HS organization. However, the larger population provided a greater cross-section of background, experience, and beliefs, which helped confirm the overall validity of the study.

When research involves human subjects, ethical issues may arise. As with any research that involves human subjects, even a study as simple and straightforward as this one that employs only an on-line survey to reach consensus on issues, there existed a need to ensure honesty, trust, and respect during research to safeguard the rights of the participants. Typically, there are four categories of ethical issues in research including

protection from harm, informed consent, right to privacy, and honesty with professional colleagues. Throughout the project the highest degree on ethical conduct was maintained. Therefore, formal written approval from Northcentral University's Institutional Review Board (IRB) was sought and obtained prior to any data collection or participant involvement (see Appendix A).

Primary data extraction from human subjects occurred only in the Delphi process in the form of a written survey. This on-line survey was conducted electronically, under informed consent, anonymously, and confidentially with the reporting of results in subsequent rounds as aggregated interpretations of what was individually submitted. Following the principles of the Delphi technique, the panel participants did not have any form of personal interaction, and their individual anonymity and responses were guarded. The Delphi panel members had no opportunity to interact directly, thereby reducing the perception of influence or application of peer pressure between members. The iterative expression of professional opinions drove the data collection. To ensure confidentiality, the commercial software, *SurveyMonkey*®, was used, which maintained all data on secure servers that could only be accessed by a unique link provided to the participants by the researcher. In order to guarantee a fair and equitable distribution of the potential benefits and burdens associated with this study, the researcher ensured that each panel member was asked to perform exactly the same duties. Consensus on issues was considered to be reached when a 75% majority of panel members agreed after each of the Delphi round of iterations was completed (von der Gracht, 2008).

Finally, this chapter included a discussion regarding the implications of each research question in the research project, as well as a list of recommendations,

conclusions, and based on the results of this study, future academic research opportunities in the field of homeland security curriculum development.

Implications

One overarching theme occurred throughout this research study: How should homeland security be defined, or more precisely, what is academic homeland security? The literature review in Chapter 2 examined various studies that have been conducted into this issue. However, it was noted that no single study produced a comprehensive list of outcome-based program objectives that could form a standardized undergraduate HS curriculum that would meet the requirements for national accreditation using established models such as that of the Accrediting Board of Engineering and Technology (ABET), a recognized organization for college and university programs in applied science, computing, engineering, and technology (ABET, 2008; Volkwein et al., 2004).

An important part of any HS curriculum is the incorporation of an outcomes-based methodology. An outcome-based education (OBE) is a measurable pedagogy to ensure that graduates of a particular program are mastering the stated learning objectives to an acceptable level. Studies have shown that OBE can play a vital role in measuring a student's degree of knowledge, skills, and abilities (KSAs) attained during the course of study (Calhoun et al., 2008; DeJager & Nieuwenhuis, 2005; Ho et al., 2009; Ramsay et al., 2010). Hence, one major thrust of this study was the development of outcomes-based student learning objectives, framed in the rubric of Bloom's taxonomy, which refers to a classification of the different learning objectives set for students. Huitt (2009) explains Bloom's taxonomy as a classification system where learning at the higher levels is

dependent on having attained prerequisite, measurable knowledge and skills at lower levels.

The results of this study expand upon the rather limited amount of previous research related to homeland security curriculum development. Using the consensus of a panel of approximately 40 subject matter experts, the study's final product was a proposed list of 15 core academic areas, eight overarching program objectives, and 50 program specific objectives that would form the elements of a standardized undergraduate curriculum in homeland security studies.

Research Question 1

Q1: What core academic areas (CAAs), overarching program objectives (OPOs), and program-specific objectives (PSOs) should comprise an undergraduate degree in homeland security?

As stated in Chapter 1, this research project addressed the lack of standardized, accredited education in the homeland security field. In conducting the Chapter 2 literature review, it became evident that there are no scholarly studies conducted on the development of a unified, outcomes-based HS curriculum. In fact, research suggests that some institutions of higher learning in this country created de facto curricula in homeland security by modifying existing degree programs in emergency management or criminal justice. Offering a modified curriculum that merely adds an element of "homeland security" to an extant course does not afford students the opportunity to gain an education based upon the actual knowledge, skills, and abilities (KSAs) that practitioners in the HS field require of our graduates. Hence, this first research question sought to survey subject matter experts (SMEs) in the field of academic homeland security and ascertain those

KSAs that they felt were essential for an undergraduate degree. Those KSAs were then to be formulated into appropriate CAAs, OPOs, and PSOs.

Several recent authors have looked at this issue in a broad sense, surveying various populations for their idea of the key elements that should comprise an HS curriculum (Bradshaw, 2011; France, 2012; Kiltz, 2011; Ramirez & Rioux, 2012; and Winegar, 2008), to name a few. However, there is only one published study to date that examines a homeland security curriculum from an outcomes-based approach, and that paper (Ramsay et al., 2010) formed the basis for this case study. This current study sought to indicate the validity of the earlier ERAU study (and others) by examining the responses of participants from the University and Agency Partnership Initiative (UAPI) regarding specific, measurable student learning outcomes that would make up an HS degree program.

The original ERAU study (Ramsay et al., 2010) surveyed a small population (N = 8) using the Delphi technique, and identified a list of eight core areas (CAs) comprising undergraduate study in HS: (a) Intelligence, (b) Law and Policy, (c) Emergency Management, (d) Risk Analysis, (e) Critical Infrastructure, (f) Strategic Planning, (g) Terrorism, and (h) Environmental Security. In addition this earlier study identified eight General Program Outcomes (GOs) that may not be tied to a specific core academic area but should be achieved by all HS majors (Ramsay et al., 2010). Thus, this researcher's follow-on case study sought to validate these KSAs by surveying a larger population of SMEs to arrive at a consensus of the core academic areas (CAAs), overarching program objectives (OPOs), and program specific objectives (PSOs) that should comprise a baccalaureate degree in homeland security studies.

The Delphi panelists in this study were presented with a list of 10 proposed CAAs, derived from a combination of the eight core areas generated by the ERAU study and two additional ones obtained from a review of other university's HS curricula and input from student surveys at ERAU. Through a series of three iterations in Round 1, the participants took the initial 10 CAAs offered and generated a list of 40 proposed core academic areas, and were then able to reduce that to a more manageable number of 17 final CAAs.

Throughout the study, data was analyzed and compiled into a cogent format. In an effort to condense and focus the effort on the PSOs, two of the 17 core academic areas were combined into a more cohesive list of CAAs. Thus, CAA # 6 - Emergency Management: Operations, NIMS and NRF, and CAA # 11 – Emergency Management were combined into one, labeled simply Emergency Management (now CAA # 5). Additionally, the elements contained in CAA # 16, labeled HS Technology, were not deemed sufficiently robust to warrant a separate CAA, and they were incorporated into the objective for the CAA labeled Weapons of Mass Destruction (now CAA # 15). That brought the final list of CAAs back to the original desired number of 15.

Round 2 indicated consensus on the overarching program objectives (OPOs) that would make up an undergraduate degree in HS. Again the Delphi panelists were presented with a list of eight OPOs from the ERAU study (Ramsay et al., 2010) and were asked to arrive at consensus regarding these elements. Of note, Round 2 was continued beyond the "normal" three iterations for Delphi methodology because it was felt that the list of OPOs was relatively short, with only eight items, and that consensus was important on these often overlooked elements of a curriculum. According to von der Gracht (2008),

the optimal number of iterations can be defined as "the minimum number of rounds necessary to reach an acceptable level of accuracy" (p. 46). For this study, the researcher deemed it necessary to achieve a high level of accuracy regarding OPOs in order to set the stage for the important task of reaching the 75% consensus in the following round on Program Specific Objectives (PSOs) that make up the heart of a curriculum. Some minor changes were made by the panelists to the original eight OPOs submitted. The culmination of Round 2 occurred when the panelists had achieved consensus on the final revision of all eight OPOs.

In Round 3, the crucial program-specific objectives (PSOs) were identified to accompany the 15 CAAs previously agreed upon in Round 1. Beginning with a list of three program-specific objectives for each of the 15 CAAs, 45 PSOs were initially presented to the survey participants. After a series of three iterations, where the panelists modified, deleted, and added PSOs, consensus was reached on a final list of 50 proposed PSOs to flesh out the 15 CAAs. Therefore, Research Question 1 was answered with the presentation of a list of 15 proposed core academic areas, and accompanying 50 program specific objectives, agreed upon by a panel of SMEs, which would comprise an HS curriculum. While the data shown in response to Research Question # 1 by no means represents an all-encompassing HS curriculum covering all possible core academic areas and program specific objectives, the implication is that there is agreement across the HS academic field of the need for a standardized curriculum, and that there are strong convictions among HS faculty of what the curriculum should contain. A list of the study's 15 CAAs with their accompanying 50 PSOs can be seen in Tables 51 and 52.

Research Question 2

Q2: What areas of overlap exist between this study's final set of CAAs, OPOs, and PSOs and those developed by earlier studies, particularly the Ramsay, Cutrer, and Raffel (2010) study?

In order to answer Research Question 2, recent scholarly studies relating to HS curriculum development were closely examined. The literature review conducted in Chapter 2 revealed a general lack of a standardized, peer-reviewed, outcomes-based curriculum for programs of academic homeland security, despite the need for such a curriculum being clearly demonstrated. Several recent studies by practitioners of academic homeland security have reached that conclusion as well (Aviola, 2011; Bellavita, 2008; Bradshaw, 2011; France, 2012; Kiltz, 2011; Polson et al., 2010; Ramirez & Rioux, 2012, and Winegar, 2008). While some of the preceding studies have utilized various forms of the Delphi technique to gain consensus among a panel of experts, and that seminal work helped set the stage for further research such as this, no one research project to date has incorporated the principles of outcomes-based education and generated a comprehensive list of core academic areas and associated program specific objectives that would comprise a standardized HS curriculum.

To draw a comparison between earlier research and that of this study, and answer Research Question 2, a thorough examination was made of the following HS curriculum development studies: Bradshaw, 2011; France, 2012; Polson et al., 2010; Ramirez & Roux, 2012; Ramsay et al., 2010, and Winegar, 2008. Of particular note, two recent doctoral dissertation studies mentioned above (Bradshaw, 2011 and France, 2012), examined the necessary components of a homeland security curriculum using the Delphi

technique to poll a panel of subject matter experts to reach consensus on the required curriculum elements of an undergraduate homeland security degree program. These research studies and papers that formed the model for the current study will be discussed in detail below.

In one of the earliest studies done on HS curriculum development, (Winegar, 2008) listed the top 10 areas that should comprise a core curriculum in HS studies, based on a meta-analysis survey of select universities, HS professionals, and HS majors. Although Winegar's study helped set the standard for research into the topic, it did not provide recommended program specific outcomes to go along with the suggested core courses. Polson et al. (2010) examined several earlier approaches to HS curriculum development and identified a list of core competencies for HS professionals and a separate list of required core courses for an HS curriculum. This study compiled input from a variety of professionals in the field of emergency management and homeland security to arrive at the list of competencies and core courses, but again, did not suggest any program specific objectives, aligned with Bloom's taxonomy, that would enable an institution to implement a fully functioning model curriculum. Bradshaw (2011) identified 13 unique subject matter areas that should be considered as essential courses in an HS curriculum. France (2012) arrived at a list of eight essential topic areas for a homeland security curriculum and a list of essential skills and abilities, plus a list of criteria to serve as benchmarks in an academic homeland security program. Finally, Ramirez and Rioux (2012) employed an education needs assessment with a select set of Department of Homeland Security (DHS) personnel and identified the top 10 HS subjects/courses that might make up an undergraduate curriculum.

It is interesting to note that the studies mentioned above, while positing a list of key courses and essential topics, did not attempt to construct a set of program-specific objectives that could utilized by HS faculty to develop a unified, standardized undergraduate curriculum – one that could be easily reviewed and approved by a national accrediting body. Program specific objectives (PSOs) are the fuel for the academic engine, and are the skills, knowledge, and abilities the students must know in order to satisfy the degree requirements and meet the needs of the HS constituents. PSOs are a vital part of the curriculum, in that they must be able to act as a yardstick to measure the capabilities of both the student and the program. That is why this researcher feels so strongly about the need for a model HS curriculum that is standardized via the inclusion of measurable, outcome-based, program specific objectives/outcomes.

One study in particular served as the exemplar, or primary basis upon which the current research project was based. The work done by Ramsay et al. (2010) at Embry-Riddle Aeronautical University (ERAU), while similar to the methodology used in this researcher's current study, but with a much smaller survey population. The ERAU study did use the Delphi technique in a series of iterative rounds to poll a virtual advisory board of homeland security SMEs regarding the elements that should comprise an HS degree curriculum. The basic purpose of the ERAU study was ". . . to develop and test a consensus set of core academic areas that could be used to represent the breadth of the homeland security enterprise in an undergraduate curriculum" (Ramsay et al., 2010, p. 2). The ERAU study resulted in the panelists identifying eight general program-level outcomes (OAs) and eight core academic areas (CAs), including definitions of those

CAs, along with a set of student learning outcomes (SLOs) in each of the eight academic areas (see Tables 3, 4, and 5 for a list of the results of the ERAU 2010 study).

Interestingly, under the final section of the ERAU study, the authors presented this opinion, "Ultimately, for academic homeland security to mature there needs to be some mechanism that would identify and vet the outcomes and best practices needed by employers of HS graduates, and which would be taught in academic programs" (Ramsay et al., 2010, p. 14). The same authors go on to ask,

> For example, at what point in the evolution of the homeland security enterprise could one derive a core set of student learning outcomes that can guide an academic program development? What should that core set of outcomes be and are these similar to those identified in this study? (p. 14)

By examining the overlap between earlier HS curriculum development studies, and the proposed curriculum presented in this study, a common theme was seen to emerge – diverse groups of participants surveyed in the studies discussed above tend to have a level of agreement, namely that there exists a genuine need for a standardized HS curriculum, based on input from academia and the field of practitioners, and that more research needs to be conducted in this area. This conclusion served to answer Research Question 2.

Research Question 3

> Q3: What additional elements are of importance to the academic field regarding the development of an HS degree program?

In order to gather data regarding a series of additional topics in an academic homeland security degree program, the researcher used a single iteration survey in Round 4 to poll the Delphi panelists. The first part of the Round 4 survey (Questions 1 - 9) was

used to collect demographic data on the participants; the second part of the survey (Questions 10 - 33) utilized a 5-point Likert scale to solicit the panelist's feedback on a series of elements pertaining to academic homeland security; finally, the third part of the survey (Questions 34 - 36) asked the Delphi panelists to rank order suggested subject areas for an Associate's, Bachelor's, and Master's degree in homeland security. An average of thirty-three panelists responded in Round 4, and their collective responses can be seen in Tables 17 - 50 and Figures 2 - 4.

In summary, the SMEs surveyed for this project represented a population of experienced, well-educated practitioners in the field of academic HS, with over 80% having between 6 - 20 years in the field, and over 96% having earned a post-graduate degree. Additional demographic data obtained from the participants showed that 76% of the various institutions the panelists represented offered degrees in homeland security, with 51% offering undergraduate degrees and 66% offering graduate degrees in HS. Also, the researcher was able to get a snapshot of the current size of HS programs at the participating institutions, with 60% reporting less than 100 HS majors, and 28% reporting 100 or more HS majors.

Of the 24 Likert scale questions in Round 4 regarding homeland security curriculum issues, 67% achieved an overall positive score ($\geq$ a mean of 3.0); correspondingly, 33% of Questions 10 – 33 received a negative rating ($<$ a mean of 3.0). Notably, the questions receiving the highest mean score ($\geq$ 4.0 mean) dealt with (a) the appropriateness of using the Delphi technique to arrive at a consensus of measurable outcomes for an HS curriculum; (b) the inclusion of a comprehensive mix of conceptual and operational courses in an HS curriculum; (c) the idea that an undergraduate HS

degree should incorporate a capstone project and an internship; (d) and finally, that an HS degree should include a set of KSAs that are both measurable and outcomes based. Conversely, the questions that received the lowest mean scores (< 2.5 mean) dealt with (a) the idea that the Federal government should have some type of oversight into HS education and curriculum development; (b) the idea that all CAAs should be equally weighted in an HS curriculum; (c) the statement that homeland security is the same thing as homeland defense; and lastly, (d) that a degree in criminal justice, law enforcement, or emergency management was the same thing as a degree in homeland security.

The responses to Questions 10 – 33, along with the calculated means, indicate the practitioners in academic homeland security prefer to develop and teach curricula without significant oversight from the Federal government. Additionally, the respondents strongly agreed that homeland security was not the same as homeland defense, criminal justice, law enforcement, or emergency management. Lastly, as the researcher hoped to confirm, the panelists agreed overwhelmingly (mean of 4.3) that the use of the Delphi technique to achieve consensus on the elements of an outcomes based HS curriculum was an appropriate and effective methodology for such a study

The final three questions in Round 4 used a ranking structure, based on a scale of 1 to 5, and asked the panelists to rank in priority a list of potential subject matter areas that might be offered in levels of a homeland security degree program. These elements, listed in no particular order were: (a) Concentrate on survey courses in as many different HS areas as possible, (b) Specialize in one area (e.g., criminal justice, emergency management, strategy and policy, etc.), (c) Identify areas of importance in accordance with job possibilities, (d) Teach to the operational, tactically-oriented level, and (e) Teach

at the strategic, policy, and legal issue level. The participants were asked to apply their rank ordering based on the structure of a curriculum for an Associate's degree, a Bachelor's degree, and a Master's degree, respectively. The results on these three questions were interesting; with the ordering of the five subject matter areas coming out exactly the same for an Associate's degree and a Baccalaureate degree. The graduate-level degree did have a different ordering of the subject matter areas, which was to be expected. However, the exact similarity between the ranking of the curriculum elements in the Associate's and Bachelor's degree program was surprising. It appears that at least among the population of UAPI membership who completed the survey, there was little perceived difference between subject matter areas in undergraduate level curricula. In order to effectively incorporate an outcomes-based curriculum, an Associate's program should have a similar set of student learning outcomes (SLOs) as in a Bachelor's or Master's degree, but arguably at a lower level of granularity in the Bloom's taxonomy (Huitt, 2009). This implies there is no general consensus among the HS SMEs surveyed regarding the intellectual ascendency from Associate's to Bachelor's to Master's degree in HS curriculum. Further research is needed in this area to determine if the data in Questions 34 – 36 are an anomaly of this study or a perception among the HS academic enterprise.

This study appears to be the first of its kind to directly query HS practitioners as to their perceptions and preferences regarding elements of HS curriculum development. The aggregate results from Round 4 directly address Research Question # 3, and imply that experts in the field of homeland security do have firm convictions as to what elements should and should not be facets of an HS curriculum. This implies a need for

further research and ultimately the wide-spread fielding of the model curriculum to determine if the participants' preferences revealed in this study actually are addressed by the proposed curriculum shown in Tables 51 and 52.

Recommendations

Based on the premise that homeland security is a dynamic, nascent field but one that is maturing and coalescing into an established academic discipline, the most effective method to substantiate the need for a comprehensive, unified HS curriculum was to conduct a case study to validate and expand upon the findings of other current studies regarding development of an academic homeland security degree program. Numerous studies point to the need for such a standardized, unified HS curriculum (Aldrich, 2002; Gordon, 2002; McCreight, 2009, and NRC, 2005). Later research such as (Bradshaw, 2011; France, 2012; Polson et al., 2010; Ramirez & Rioux, 2012, Ramsay et al., 2010; and Winegar, 2008) began an examination of the elements that should comprise such a curriculum. Hence, the major goal of this research project was to build on earlier research and development a model HS curriculum. Those goals were accomplished by surveying a panel of HS SMEs and through consensus, identifying a set of 15 CAAs, 50 associated PSOs, and eight OPOs (see Tables 51 and 52). This model HS curriculum can be employed and modified by institutions of higher learning that wish to offer a standardized curriculum based on measurable learning objectives.

Another feature deemed critical in a HS curriculum was an ability for the academic program to achieve accreditation by a national, recognized body, such as the Accrediting Body for Engineering and Technology (ABET, Inc.), or some similar organization. Accreditation is crucial to ensuring that academic programs are successful

and sustainable, and enables a program to demonstrate that they have achieved a defensible level of integrity, performance, and continuous quality improvement (Heyman & Carafano, 2008). A curriculum that adheres to a set of standards that are outcomes-based and measurable is another vital pedagogical component of accreditation. The results of this study show that the survey population strongly agrees with the value of national accreditation of an HS curriculum. However, there exists a void in this area, with no national body fulfilling the role of accreditor for HS academic programs, despite the early work done by HSDEC and its successor, HSDECA. Currently, the Foundation for Higher Education Accreditation (FFHEA), originally chartered solely for the field of emergency management, is now pursuing recognition as a specialized accrediting organization by the U.S. Department of Education. This will allow FFHEA to accredit not only emergency management programs, but homeland security and other related academic programs using discipline-specific, outcomes-based learning outcomes (J. D. Ramsay, personal communication, July 28, 2012). That expansion of the FFHEA's accreditation authority should be pursued, as it is currently the best organization poised to become the national professional association to represent HS education. Hopefully, another outcome of this study will be a suggested curriculum that will enable colleges and universities wishing to incorporate it into their programs, a tool that will lead to a standardized curriculum much easier for a national accrediting body to review and approve.

Finally, it is recommended that OBE pedagogy be incorporated into any standardized HS curriculum adopted by an institution of higher learning. The participants in this study clearly validated the premise that in order to achieve the highest

degree of effectiveness from a curriculum, it must have learning objectives that are both achievable by the student and measurable by the institution. Clearly stated student learning objectives such as the ones recommended in the model curriculum developed via this study should be aligned with the Bloom's taxonomy rubric and accompany each core academic area in a curriculum. This will enable faculty to better assess students against external, absolute objectives, instead of measuring students' relative achievements (i.e., grading on the normal distribution curve). An assessment plan, coupled with a process to ensure continuing quality improvement, should be a standard part of any outcomes-based curriculum, especially one as dynamic as the homeland security enterprise.

Further study and research should be conducted on the topic of academic HS curriculum development, standardization, and accreditation, not only for an undergraduate program, but at the graduate level as well. Future research should consider development of empirical methodology to accurately measure the achievement of learning outcomes and a means of providing a feedback loop with the goal of continuous quality improvement. This study is significant because, unlike other similar studies, this research used a large, representative sample of HS scholars and practitioners as its respondent SMEs to develop a homeland security curriculum modeled on outcomes-based education and one that included a full set of associated program specific objectives. That recommended model curriculum is depicted in Tables 51 and 52 and is discussed in the following section.

Proposed undergraduate curriculum. The results of the research study list a proposed undergraduate curriculum in homeland security made up of 15 core academic areas (CAAs) and 50 associated program specific objectives (PSOs), as depicted in Table

51. Additionally, the list of eight overarching program objectives (OPOs) derived during the study is included as Table 52.

Table 51

Proposed Curriculum - Summary of CAAs and PSOs

Core Academic Areas	Program Specific Objectives
CAA1. *All Hazards Threats Critical Analysis*: analysis of all hazards threats existing in the security environment, man-made and natural. Focus on man-made and natural threats, risk management, and matching means (capability) with ends (homeland security policy objectives).	PSO 1: Discuss the evolution and identify the main components of critical infrastructure and key resources protection in the U.S. as they apply to an all hazards approach. PSO 2: Analyze the functions of risk management methodologies as they apply to the phases of disaster management in an all-hazard environment. (Reference ISO 31000) PSO 3: Apply the central components of a risk management process and be able to carry out those processes, given a specific problem and stated criteria
CAA 2. *Critical Infrastructure*: study of systems and assets, whether physical or virtual, so vital to the United States that the incapacity or destruction of such systems and assets would have a debilitating impact on security, national economic security, national public health or safety, or any combination of those matters.	PSO 5: Discuss the core components, responsibilities and authority of the Department of Homeland Security, the Federal Emergency Management Agency and other sector-specific response and recovery agencies as they apply to critical infrastructure. PSO 6: Identify and define Critical Infrastructure and Key Resources (CIKR) as delineated in the National Infrastructure Protection Plan (NIPP), HSPD7, Sector-Specific Plans, the states, and the private sector. PSO 7: Analyze the interrelationships between the concepts of security, vulnerability, threat, risk, and consequences as they apply to critical infrastructure protection. (Reference ISO 31000)

Core Academic Areas	Program Specific Objectives
CAA 3. *Cyber Security – Information Security*: the examination of cyber-crime, terrorism, and warfare including how terrorists use the internet. Systems, assets, threats, and countermeasures pertaining to security in all areas of communication are discussed. Includes the governmental responses to cyber-attacks and Electromagnetic Pulse (EMP) attacks.	PSO 8: Summarize the concept of cyber-security and how it relates to the U.S. critical infrastructure in regards to homeland security. PSO 9: Identify factors of critical importance for an information network and the vulnerabilities that adversaries may exploit to create cyber-attacks. PSO 10: Evaluate the federal government's policy and programmatic efforts, along with those of the public and private sector, in dealing with cyber-security, to include issues relevant to cyber-crime, cyber-warfare, and cyber-terrorism. PSO 11: Analyze the major U.S. cyber-security policy and legal issues and their implications for federal government's activity at both national and international levels.
CAA 4. *Disaster Response, Recovery, and Society*: a review of the effects of disaster on society using the phases of disaster as the basis of study. This includes review of both individual and group reactions to disasters. Also focuses on concepts and operational procedures for responding to major disasters, to include federal, state and local roles and responsibilities in major disaster recovery, with emphasis on government.	PSO 12: Describe the disaster policy, strategy, and plans of the United States in regard to legislative authorization, assignment of responsibility, and balance of responsibility among jurisdictions at the local, state, tribal, and federal government levels. PSO 13: Compare and contrast the short-term versus the long-term needs of responders, relief agencies, survivors, and victims during the response and recovery phases of a disaster; identify differences according to types of disasters.
CAA 5. *Emergency Management:* Overview of the process of coordinating resources to deal with emergencies in a timely, effective manner, thereby saving lives, and minimizing injury, environmental damage, and economic loss. This protection process involves four phases: Preparedness, Mitigation,	PSO 14: Explain the emergency management cycle, from pre-incident, incident, and post-incident, as it applies to the different phases of disaster. (Reference PPD-8) PSO 15: Examine the legal framework that guides the operation of the National Incident Management System (NIMS) in the United States, including the role of federalism.

Core Academic Areas	Program Specific Objectives
Response, and Recovery. Also includes discussion on day-to-day emergency response scenarios for first responders. NIMS and NRF, both essential to understanding preparation and response to all hazards, are examined.	PSO 16: Explain post-9/11 national response policy in the U.S to include the role of HSPD-5, the Incident Command System (ICS), the National Incident Management System (NIMS), and the National Response Framework (NRF). PSO 17: Identify all applicable, in force, Homeland Security Presidential Directives (HSPDs) and Presidential Decision Directives (PPDs) that relate to emergency management.
CAA 6. *Ethics, Integrity, and Leadership in Homeland Security*: examines making decisions based on facts, cultural sensitivities, and convictions commonly accepted principles of conduct for public officials, and desired business outcomes and consistency in these decisions to make the "right" decisions in a consistent manner for the benefit of all U.S. citizens.	PSO 18: Describe the major themes of the Standards of Conduct for Federal Employees listed in 5 CFR Part 2635, as a basis for conduct of public officials. PSO 19: Describe the elements of personal accountability, integrity, and transparency as they apply to conduct of public officials. PSO 20: Compare and contrast the five principle sources of ethical standards: the utilitarian approach, the rights approach, the fairness or justice approach, the virtue approach, and the common good approach.
CAA 7. *Fundamentals of Homeland Security Management*: Discussion on Federal mandates, State and local organizational constructs and the vertical and horizontal integration of policy, and application of policy, to improve capabilities by mitigating risks in a resource limited environment.	PSO 21: Identify and explain the roles of local, state, tribal, and federal agencies that have management responsibility of Homeland Security specific functions. PSO 22: Evaluate how federal, state, local, and tribal agencies work together in systematic preparation for the threats that pose great risk to the security of the Nation, including acts of terrorism, cyber-attacks, pandemics, and catastrophic natural disasters. PSO 23: Describe the history of intelligence gathering and sharing between federal agencies and state/local/tribal agencies in the United States before the terrorist attacks of 9/11/2001, including the role of today's fusion centers.

Core Academic Areas	Program Specific Objectives
CAA 8. *Homeland Security Policy Studies and Analysis*: the study of the governmental organizations and bodies which formulate and implement policies, processes and procedures in support of homeland security. Considers HS comprehensively as a public policy system, ranging from formulation, through implementation and finally evaluation. Cases for discussion are derived from the HS policy experience. Focus is on both structure and behavior of institutions and the members of those institutions. Provides the basic structures, laws, organizations and policy situations - the subject matter framework - for homeland security.	PSO 24: Critique the current National Security Strategy (NSS) as to its goals, objectives and allocated resources regarding domestic and international terrorism. PSO 25: Analyze the relationship between FEMA and local governments in terms of responsibility for preparation and FEMA's ability to respond to multiple catastrophic events.
CAA 9. *Interagency Coordination, Support, and Relations*: review of the relevant actors in homeland security - national and state agencies - what they do and how they work together. This is important to understand how each functions and when an issue remains with the State and when it transitions to Federal. Included are also U.S. federal Department responsibilities, such as DOD, DOT, DOA, DHHS, etc.	PSO 26: Compare and contrast the relationships and roles among local, state, and federal law enforcement, along with not-for-profit organizations, in regards to developing and executing HS strategy. PSO 27: Compare and contrast the role of the Department of Homeland Security (DHS) and the Department of Defense (DOD) regarding homeland security and homeland defense. PSO 28: Describe how the U.S. Dept. of Transportation (DOT), the U.S. Coast Guard (USCG), and the Transportation Security Administration (TSA) interact with other HS and emergency management agencies regarding all modes of transportation security.
CAA 10. *Intelligence*: a study of the systematic process of legal collection, analysis, interpretation, production, and dissemination of both open and closed source data/information to appropriate	PSO 29: Describe U.S. intelligence and counter-intelligence concepts and strategies, to include the collection, analysis, and dissemination of intelligence data both within the U.S. and internationally.

Core Academic Areas	Program Specific Objectives
stakeholders in support of global, national, state, or local policy and/or strategy.	PSO 30: Compare and contrast the organization, mission, and authority of the federal Intelligence Community (IC), state and local intelligence agencies within the U.S., and private/corporate sector intelligence efforts. PSO 31: Assess the various forms of intelligence (e.g., human intelligence, geospatial intelligence, etc.) and propose how data from each might be integrated into security policy and strategy. PSO 32: Explain the role that Operations Security (OPSEC) plays in the intelligence cycle.
CAA 11. *Law and Policy:* examination of legal and policy statutes, and principles (national and international) that provide the basis and direction of homeland security means and objectives, including the federal laws that provide federal oversight to homeland security policies and the limits and interactions of such laws with constitutional, state, and local authority.	PSO 33: Identify and discuss major themes of U.S. law as they apply to Homeland Security and the responsibility and authorities assigned to federal, state, tribal, and local agencies. PSO 34: Differentiate between U.S. regulatory authority (e.g. the PATRIOT Act) and presidential authority (e.g. HSPDs) regarding homeland security, homeland defense, and emergency management. PSO 35: Compare and contrast the core components of U.S. Constitutional law principles, with the principles of international law (law of war; Geneva Conventions) and the relationship of each to homeland security. PSO 36: Identify the authorities and provisions of the Stafford Act in regard to the DHS disaster planning scenarios and analyze how the Act works with other major HLS/EM legislation and executive orders, including the Post-Katrina Emergency Management Reform Act of 2006 (PKEMR").
CAA 12. *Risk Analysis / Management*: discussion and practical exercises pertaining to the	PSO 37: Describe the main sectors of critical infrastructure and key resources (CIKR) in the U.S. as identified in the NIPP and the

Core Academic Areas	Program Specific Objectives
systematic method of identifying the assets (e.g., critical infrastructure and key resources) of a system, the threats to those assets, and the vulnerability of the system to those threats in such a way as to be able to rank order threats and their consequences to a system for the purpose of developing appropriate countermeasures and priorities for resource allocation.	evolution of resilience and protection measures developed for them. PSO 38: Summarize the main functions of risk analysis/management methodologies, and demonstrate their application in practical exercises and policy development at federal, state, and local levels and private sector infrastructure management. PSO 39: Analyze the interrelationships between the security, vulnerability, threat, and risk concepts as applied to risk analysis and development of countermeasures
CAA 13. *Strategic Planning*: examining the process of defining an organization's strategy (a long term plan of action, such as operational plans and contingency plans, designed to achieve a particular goal or objective) or direction and making decisions on allocating its resources to pursue this strategy, including its capital, its public information, its technology and its human resources.	PSO 40: Discuss the basic principles underlying strategic planning, and illustrate these principles as they apply to the National Strategy for Homeland Security. PSO 41: Compare and contrast the applicable national strategies and plans related to HS security, including their history, inter-relationships, similarities, and differences. PSO 42: Examine the role of strategic planning in the evolution of the mission and vision of U.S. "national resilience" and given a specific scenario, assess the strengths and weaknesses of the concept of strategic planning in preventing or mitigating a resultant security crisis.
CAA 14. *Terrorism Studies*: a critical analysis of the origins, goals, and ideologies of the unlawful use of force and violence against persons or property to intimidate or coerce a government, the civilian population, or any segment thereof, in furtherance of political or social objectives.	PSO 43: Compare and contrast the specific types of terrorism (e.g., state-supported, transnational, domestic, international) and how radicalization plays a part in each. PSO 44: Discuss the history and basic concepts of transnational and domestic terrorism to include major groups, origins, ideologies, and underlying causes. PSO 45: Discuss issues relating to counter-terrorism efforts, including military tribunals,

Core Academic Areas	Program Specific Objectives
	legal vs. illegal incarceration, use of torture vs. enhanced interrogation, extraordinary renditions, and applicable U.S. court decisions. PSO 46: Discuss how radicalization occurs and how it is manifest in the specific types of terrorism, including its influence on the psychology of the suicide bomber.
CAA 15. *Weapons of Mass Destruction:* studies of the techniques to prepare for and improve the ability to manage and respond to mass casualty terrorism incidents caused by weapons of mass destruction (WMD), including suicide bombers and chemical, biological, radiological and nuclear weapons (CBRN), and the signs of WMD attacks with appropriate response.	PSO 47: Describe the nature and forms of the threat posed to HS assets and facilities by WMD, including chemical, biological, nuclear, radiological, and explosives (CBRNE). PSO 48: Discuss the different indicators of WMD attacks with chemical, biological, nuclear, radiological, or explosives (CBNRE) and the appropriate response for each, including DHS and DOD assets specifically designed to prepare for and respond to a CBRNE attack, e.g., WMD-CST and CERFP. PSO 49: Analyze the similarities and differences between the response to a terrorist attack using CBRNE weapons and a response to a natural disaster or technological (human-caused) event; including the special challenges to recovery posed by a terrorist WMD event. PSO 50: Identify and apply risk management techniques to describe resource utilization in preventing, detecting and recovering from CBRNE attacks. (Reference ISO 31000)

The eight overarching program objectives (OPOs) as developed during Round 2 of the study are listed in Table 52.

Table 52

Proposed Curriculum - Summary of OPOs

OPOs	Description
OPO1	Demonstrate application of homeland security concepts in an operational, out-of-the classroom setting through an internship, cooperative, or supervised experience that includes real-world experiences, strategies, and objectives, with oversight by the academic HS program and the company/agency involved; or demonstrate equivalent professional experience. (If unobtainable, may be replaced by OPO8).
OPO2	Design and apply qualitative and quantitative research methods and statistical analysis (knowledge of mathematics and physical science) to homeland security issues
OPO3	Demonstrate an ability to work collaboratively in a diverse team or group, employing sound decision-making and communications.
OPO4	Understand the local, regional, national, and global implications of homeland security issues, strategies, and operations, and how they affect the creation and implementation of homeland security policy.
OPO5	Demonstrate competency in the design, conduct, and evaluation of drills, training, or exercises, applicable to the disciplines of homeland security and emergency management.
OPO6	Interpret the strategic implications of existing and emerging homeland security-related technologies, and compare their costs and benefits.
OPO7	Demonstrate an ability to recognize, evaluate, and assess contemporary or emergent threats, challenges, or issues including natural and man-made hazards.
OPO8	Demonstrate either through a capstone practicum or an undergraduate thesis, the ability to synthesize, critically analyze, and evaluate homeland security issues or challenges producing a scholarly, culminating product suitable for publication in a homeland security journal. (May be substituted for OPO1 if an internship is unobtainable).

The model curriculum listed above encompasses the elements that a sample population of subject matter experts in academic homeland security agreed should comprise an undergraduate curriculum. Certainly, the academic homeland security

enterprise is so diverse, dynamic, and includes such a myriad of professional competencies that one curriculum could not cover every academic core area that could be taught. However, the proposed model curriculum paves the way for continuing professional dialogue and debate regarding the evolution of HS education. Additionally, adoption of this standardized model curriculum should enable a college or university to more readily obtain accreditation via a national accrediting body, as the pedagogy is tied to outcomes-based, measurable objectives incorporating Bloom's taxonomy. Each institution of higher learning that is now offering, or plans to develop, an undergraduate degree program in homeland security studies can use this model curriculum as an exemplar, making changes as necessary, all having a common base from which to originate. As stated earlier, additional research is needed to develop a similar outcomes-based model curriculum for a post graduate degree program in academic homeland security.

Conclusions

Homeland security as a national enterprise is here to stay. As mentioned in Chapter 1, the requirement to provide for the common defense of the homeland remains as fundamental today as when the concept was written into the U.S. Constitution, more than two hundred and thirty-six years ago. No matter what the state of the economy; no matter what political party resides in the White House; no matter what the international political scene, the United States will always have to protect itself from attacks by aggressors (both conventional and asymmetric) and from natural or technological disasters. Case in point, Hurricane Katrina was more expensive for the nation to recover from than the terrorist attacks of 9/11 (Waugh, n.d.). To meet the challenge of these and

other emerging threats, the 21st century homeland security practitioner must be able to command a framework of certain core competencies, and must have mastered certain sets of knowledge, skills, and abilities provided by institutions of higher learning. That means the academic discipline of homeland security is here to stay as well. Educating this next generation of homeland security professionals is the job of academe. However, to accomplish this education effectively and efficiently requires a well-developed, comprehensive curriculum, based on measurable outcomes and recognized standards (Forster & Plant, 2010). To ensure efficacy in academic programs, a curriculum must have a set of metrics by which the program can be measured to ensure continuous quality improvement. A curriculum should contain student learning objectives that serve to identify specific program outcomes. These learning objectives must be associated with specific core academic areas that are defined by subject matter experts and that ultimately achieve programmatic goals that facilitate program accreditation. However, there is currently no national accrediting body to validate the myriad of homeland security education programs being offered around the nation (Moore et al., 2010). Nor, at present, is there an agreed upon, standardized HS curriculum being offered by these programs.

In summary, this study built upon the work of previous research projects and added to the body of knowledge regarding development of a homeland security curriculum. A literature review revealed numerous sources that validated the need for a standardized HS curriculum. Among them, Gordon (2002) stated that academe must help build the capacity of the Federal government by educating students that will be able to address the current and future challenges to homeland security. Accreditation was mentioned in current scholarly studies, e.g., McCreight (2009), as a vital element in the

overall strength and validity of an academic program. Outcomes-based education (OBE) was recognized by many sources as a valuable tool for curriculum development in that it must describe actual student learning objectives that can be assessed using measurable performance metrics (Aldrich, 2002). Lastly, the results of previous studies, most notably the original ERAU study by Ramsay, Cutrer, and Raffel (2010) were validated and enhanced by this current study, demonstrating that the Delphi technique is an effective and appropriate tool for conducting qualitative research on an emerging topic. While the data in this current project is not all-inclusive due to the size of the population survey, and is not definitive based on the nature of the qualitative research methodology used, the research does serve to validate earlier work done on the issue of HS curriculum development. This study has drawn upon the knowledge, experience, and opinions of a panel of HS experts to construct a model curriculum that meets the requirements listed above. The intent of the study was not to stifle academic creativity in curriculum development but to offer an alternative idea to the currently disjointed approach to academic homeland security education in this country. The data presented in this study will hopefully spark debate which will lead to modifications to existing HS academic programs, degree curriculum, and course content.

Homeland security is an emerging, somewhat nascent discipline; however, the compendium of new HS academic programs that has sprung up since 9/11 indicates the growth of widespread acceptance of this major in undergraduate education. But that is not the end of the story. As Ramirez & Rioux (2012) state in their concluding summation, "As a new field, the continuing evaluation and re-evaluation of [homeland security] curricula should continue so that it remains relevant, innovative, and valued by

the customers" (p. 24). This essential need is recognized not only by academia but by the Federal government, as evidenced by a report in the March edition of the *Chronicle of Higher Education*, which states that the Secretary of the Department of Homeland Security, Janet Napolitano, has formed a new committee, composed of 19 university presidents and academic leaders, to advise DHS on topics that affect academe. Additionally, Secretary Napolitano has created an Office of Academic Engagement to coordinate department-wide efforts on issues related to higher education (Fischer, 2012). Perhaps this signals a new commitment by the government to more closely engage academe in the design and pedagogy of a standardized, accredited curriculum for the nations' homeland security students in higher education. Hopefully, this study can assist in that important effort.

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Appendixes

Appendix A:

IRB Application Form (with extension)

NORTHCENTRAL UNIVERSITY
INSTITUTIONAL REVIEW BOARD

Application for use of human PARTICIPANTS in research

The mission of the Northcentral University (NCU) IRB is to protect the dignity, rights and welfare of human participants in research conducted by NCU Learners, faculty mentors, and staff. Research in which data are collected through the involvement of human participation may not be conducted in the absence of IRB approval. This application should be completed by NCU Learners, faculty mentors, and staff planning to conduct any research (including independent research projects and dissertation research) involving human participants. This includes any research in which data from human participants will be or have been collected. Thus, researchers using secondary data (e.g., survey archives or archived records) must complete this application. ***Your proposed research may not proceed unless approved by the IRB.*** Finally, remember that you must complete the CITI ethics education program prior to submitting your application. Your completion certificate must be included with this application.

Submission Instructions: IRB applications must be submitted by a faculty, faculty mentor or an administrative staff member at NCU. If a Learner will be conducting the proposed research, the course mentor or dissertation Chair person must submit the Learner's application after approving the application.. E-mail an electronic copy of the completed IRB application and supporting documents to **irb@ncu.edu** in the following format:

1. **Email subject heading:** *Last name of Researcher_First initial IRB Application*
2. **IRB Application. Note that the IRB application should be saved as:** *Last name_First initial IRB_year. Example for Robert Hernandez submitting an application in 2010 = Hernandez_R IRB 2010.* Note: For dissertation research, the Learner is the Researcher/Principle Investigator.
3. **Attachments:** *Include all supporting documents as attachments (including: consent/assent forms, surveys, CITI completion certificate, and any other relevant materials).*
4. **DO NOT SUBMIT YOUR APPLICATION AS A PDF OR ZIP FILE.**

Allow at least two weeks and as long as five weeks for the IRB to review your application. Because you may be asked to submit a revised application, submit your materials well in advance of the time that you plan to begin your research. Please note that for dissertation research, an IRB application cannot be reviewed prior to the Proposal receiving University approval.

Do not begin collecting data until you receive the approval notice; doing so can result in immediate dismissal from the University.

Principal Investigator: **Daniel A. Cutrer**	Phone:(386)2093570	Email:danielcutrer@gmail.com
School: ☒ Business ☐ Education ☐ Psychology		
Principal Investigator is: ☒ Graduate Learner ☐ Faculty/Staff ☐ Undergraduate Learner		
Date of completion of CITI ethics education course: (You must attach CITI completion certificate)		

Supervising Faculty Mentor: (formerly, Dr. Lewis Mustard) currently, Dr. Kenneth Gossett	E-mail: executivehealthcare@yahoo.com

List any other institutions/organizations that are involved in this research (e.g., schools, companies, hospitals, etc. where data may be, or in the case of secondary/archival data analysis, were collected). Your application should include evidence that the institution has reviewed and approved your project. If there are cooperative agreements that you have established for the research, provide a copy of the agreements.
Other institution:
Other institution:

Project Title (i.e., Dissertation Title or Title Presented to Participants):
Developing a Homeland Security Curriculum: A Case Study in Outcomes-based Education Using the Delphi Method

Project Period From: Spring 2010 To: Spring 2012

Type of Research (see attached description of research types): ☐ Exempt ☒ Expedited Review ☐ Full Review

PROJECT DESCRIPTION

If applicable, describe any external funding for this project:
N/A

Age Range of Participants: 25 - 65

Estimated # of Participants: 338

Participant Characteristics (check all that apply):
☒ Adult ☐ Minor ☐ Non-student ☐ College Student ☐ Normal Volunteers ☐ In-patients
☐ Out-patients ☐ Pregnant women ☐ Prisoners ☐ Mental disability ☐ Physical disability
☐ DSM diagnosis: ☐ Other descriptor:

Check any of the following that apply to your project:			
☐	Participants with Disabilities	☐	Protocol is of a Sensitive or Controversial Nature
☐	Children or Minor Participants (under 18 yrs. Old)	☐	Exposes Participant to Possibility of Physical or Mental Injury/Harm
☐	Prisoners, Parolees or Incarcerated Participants	☐	Alcohol, Smoking or Drug Related Participation
☐	Suicidal Questionnaires and/or Evaluations	☐	Involves Attachment of Any Apparatus to the Participants
☐	Pregnant Participants	☐	Physical Exercise Studies

☐	Fetal, Placental or Surgical Pathology Tissue(s)	☐	Involves Collection of Blood Samples (fingerpricks/venipuncture)
☐	Involves Deception or Manipulation of Participants Behavior or Response	☐	Therapist/Client Relationship

	YES	NO
Does Research Involve More than Minimal Risk to Participants? If yes, please explain fully in Benefit & Risk section of this application	☐	☒

Minimal risk means that the probability and magnitude of harm or discomfort anticipated in the research are not greater in and of themselves than those ordinarily encountered in daily life or during the performance of routine physical or psychological examinations or tests. [45 CFR 46.102(i)]. See attached description.

Please provide complete answers to the following questions as they relate to your use of human participants. Avoid the use of jargon, abbreviations or scientific terms, unless those items are defined in your procedures. If applicable, you should include copies of any tests, surveys or questionnaires along with your completed application. Use Additional Sheets for answering, if needed. Do not simply paste text from your proposal. The application must clearly and briefly address the questions.

Purpose & Significance: Explain the purpose of your research. Include any scientific need or rationale as well as significance of knowledge. Please limit to no more than 300 words.

The purpose of this qualitative study is to develop validated core academic areas and program-level, learning-based outcomes for an undergraduate degree in homeland security (HS) using the Delphi technique. The Secretary of the Department of Homeland Security has stated that there is currently a need for increasing the level of education and expertise of those individuals entering the department. Therefore, data generated from this study may well help set the academic accrediting standards for undergraduate homeland security degree programs throughout the country, thus creating a national capacity to deliver appropriately. As no similar study of this magnitude has been accomplished in the field of academic homeland security, this research would benefit the entire field of higher education in meeting the documented challenge of providing the next generation of HS practitioners with the necessary knowledge, skills, and abilities.

Participant Population & Recruitment: Include the number of participants, gender and age(s), Explain rationale for any participant exclusion, Describe how potential participants will be identified and recruited, (If applicable, submit copies of recruitment advertisements, flyers, newspaper ads, etc., along with completed application.)

Participants for the study will be chosen using a convenience, purposive sampling methodology suitable for qualitative research. The survey population will be comprised of the 338 members from 2010 roster of the participating institutions and agencies of the University and Agency Partnership Initiative (UAPI) program, chartered by the Center for Homeland Defense and Security (CHDS). The members of UAPI (211 institutions of higher learning and various federal agencies) work to facilitate educational collaboration among institutions and agencies across the nation to support development of homeland security academic programs. This population was chosen because they are experts in the field of academic homeland security/defense by virtue of their education, judgment, skills, and experience. The researcher will not know the specific demographics

(gender and ages) of this sample population at the outset of the study since the entire membership of the professional organization is being surveyed. However, demographic data will be collected in the final phase of the study via a survey questionare. Each of the 338 individual members of UAPI will be invited to participate in the study and will be provided an Informed Consent form (see Attachment A) via an introductory e-mail, explaining the concept of the study, participant's responsibilities, and re-affirming the fact that the study is completely voluntary.

Research Procedure: Describe the research design and procedure. Be sure to state the hypotheses and the research design. Describe exactly what is to be done to the participant(s), and what they will be expected to do. This description should include instructions given to participants, activities in which participants will be asked to participate or engage in, special incentives, and experimental procedures. Be specific.

If an interview, survey or other questionnaire techniques will be employed, include a copy of questions, the type of questions that will be asked and a copy of each data-gathering instrument. Include a copy of all surveys, paper and pencil tests, standardized questionnaires, open-ended question-interview material, etc. Be sure to name and briefly describe each questionnaire to be used. If development of these materials is part of the project, describe the nature of information to be collected from participants as specifically as possible; especially describe any personal and sensitive information to be requested of participants.

Specify the total time it will take for a participant to participate and, as applicable, the number and duration of sessions for each participant, and the time period over which a participant will participate.

The study will be conducted using the Delphi technique – a research methodology that employs iterative, consensus building via a secure, on-line survey. The survey will be conducted in three rounds, and will proceed in rounds until a 75% consensus is reached among the panelists. Participants will be required to log onto a secure website and make three choices regarding each question: keep with no edit, keep, but edit, or toss. The anonymous responses will be collected by the researcher and collated into a consensus report. Each round is estimated to take a participant approximately 10 - 30 minutes, depending upon their level of editing to the proposed elements. The entire study is estimated to require approximately 90 days to compete. A list of proposed survey questions is attached as Appendices C, D, and E to the Proposal Paper.

Benefit & Risk: Have the risks involved been minimized and are they reasonable in relation to the anticipated benefits of research? If more than minimal risk is involved, please explain what additional measures will be taken to ensure participant safety, Explain importance of knowledge that may reasonably be expected regarding risk.

To this researcher's knowledge, no similar study has been conducted to determine the outcomes-based curriculum requirements for an undergraduate degree in HS using the Delphi technique. In the growing field of academic HS, there is no national accrediting body as of yet, and institutions of higher learning have compiled divers HS degree programs, with no standardization or accreditation oversight. It is hoped that this study will be able to propose a standardized set of core academic areas and program-level outcomes that will comprise an associate, undergraduate, and graduate degree in HS, based on sound research methodology and practitioner consensus, that will be adopted by the national accrediting body for HS degree programs.

Risks to participants are minimal, as the only interaction will be via a secure, on-line survey regarding their

opinions of curriculum issues for an undergraduate HS degree. Precautions to minimize risk will be via use of an Informed Consent form, and the guarantee of anonymity through the Delphi process. Respect, honor, integrity, and professionalism will be maintained throughout the study, between researcher and panel members.

Informed Consent (and Assent): Attach a copy of the consent and/or assent form(s) you will use to obtain informed consent from participants, , Describe procedures for obtaining informed consent and answer the following:

a) Who will be obtaining informed consent?
b) When will subjects be asked to participate and sign the consent form (or given the opportunity to agree to consent)?
c) If applicable, how will minors assent be obtained? Assent is an additional requirement whenever minors are asked to participant as research participants (i.e., in addition to gaining parental consent, a researcher is required to gain "assent" from participants who are under the age of 18 years old.)

The survey population will be the 338 members from the 2010 roster of the University and Agency Partnership Initiative (UAPI) program, who are experts in the field of academic homeland security/defense. The Principal Investigator will contact each person from the UAPI membership via e-mail and invite them to participate in the research project . This e-mail will contain an Informed Consent form (see Attachment A), explaining the concept of the study, participant's responsibilities, and re-affirming the fact that the study is completely voluntary. The participants will be asked to return to signed Informed Consent form to the Principal Investigator, if they choose to participate.

Anonymity or Confidentiality: Describe how either anonymity or confidentiality of participants will be maintained. (Note: if a participant signs a consent form and/or identifiers are obtained by researcher, anonymity cannot be promised.) Confidentiality should always be promised "to the extent allowed by law.") For studies involving internet surveys, researcher should clarify how email addresses will be disassociated from submitted responses in order to maintain confidentiality.

The Delphi technique used in this study ensures anonymity of the participants since the panel members are surveyed individually and the members have no direct contact with each other throughout the study. The researcher is the only person that sees all of the survey input, and that data is collected via a secure web site. The survey data is viewed on a password-protected computer that only the researcher has access to, and any data files are kept on a password-protected removable flash drive that is locked in the researcher's desk during the evening. No other parties will have access to the survey data. Once the research study is complete, the results will be published in a peer-reviewed paper, but the names of the Delphi panel members, and any identifying information, will be kept out of the paper. Any files or data maintained on the study will be kept under lock and key by the researcher once the study has been completed

Audio/Video Taping: If audio or video taping of participants is included in your protocol, please explain the disposition of the recordings and/or any other pictures or personal documentation collected during and after completion of your data collection, You should state how long these items will be kept, where stored, and a data destruction date, etc.

N/A

Compensation: If participants will be compensated for their participation, provide detailed information about the amount and the method/terms of payment, If non-monetary compensation (e.g., course credit, services) will be offered, explain how it will be provided, If no compensation will be provided, please state such.

N/A

Deception: If the research involves deception or coercion, please describe how and why deception or coercion is required. Also provide the explanation or debriefing that will be provided to the participants at the end of the experiment, and how the debriefing will occur (e.g., in person, written form, telephone).

This research study involves no deception or coercion, but is 100% voluntary in nature. Once ther survey is complete and the data have been processed by the researcher, the results of the survey will be provided to each participant via a concluding e-mail. Each subject will be thanked for their participation in the study and will be informed as to the final disposition of the project's results (i.e. submission to a peer-reviewed journal).

Debriefing: If applicable to your protocol, please explain your method for debriefing participants at the end of your data collection. This includes providing information on the purpose and/or results of your study. If you do not intend to provide a debriefing, please explain.

At the end of the study, when consensus has been reached regarding the elements of each Delphi round, the researcher will compile the results into a report format and distribute a copy to each of the participants via e-mail.

By signing below (or typing my name if transmitted electronically), I certify that I am knowledgeable and agree to comply with all regulations and policies governing research with human participants. I have completed the required CITI ethics tutorial (and attached a copy of the certification of completion to this application.) I acknowledge that I am responsible for requesting

any proposed modifications to this protocol for review and approval by the IRB prior to implementation. I further agree to report any adverse events immediately to the NCU IRB and to comply with all requests to report on the status of a study if so requested. (Faculty mentors hereby also agree to have read and be responsible for guidance and assuring ethical standards during collection of data regarding this protocol).

Principal Investigator: Daniel A. Cutrer	Date: 8-15-10
Supervising Faculty Mentor: Dr. Lewis Mustard / Dr. Kenneth Gossett	Date:
Co-Investigator (if applicable):	Date:

Daniel A. Cutrer
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e-mail: Danielcutrer@gmail.com

Northcentral University
IRB Committee
Attn: Sherri Alamillo
10000 University Drive
Prescott Valley, AZ 86314

December 1, 2011

Dear Sherri,

I am writing to request an extension on the IRB approval for my doctoral research project. After discussing the issue with my current Dissertation Committee Chair, Dr. Ken Gossett, he suggested I contact you with my request.

By way of background, I originally received an IRB approval (IRB: 2010-08-26-142) for my doctoral research project on August 26, 2010. Since then I have been working, slowly but surely, on my project but have encountered unexpected difficulties and delays due to the nature of the research itself. My dissertation topic is developing an outcomes-based undergraduate curriculum for a homeland security degree program. I am using a Delphi technique for my research methodology, which requires a 75% consensus to be achieved among the participants during a series iterative rounds. My sample population consists of about 40 academic colleagues, and the questions we are working on to achieve that consensus are thought-provoking and each member has his/her own deeply held opinions. To date, the panel members in my research have identified 15 Core Academic Areas in a homeland security undergraduate degree. Just to achieve consensus on those 15 items took months and several iterations. My research study suggests that each of the 15 Core Academic Areas already identified will have from six to eight Program Specific Outcomes associated with each of them. That means the consensus building effort will have to be spread over 100 different program-specific elements, and that is proving to take much longer than I anticipated – hence, the long delay in completion of the project. At the current rate of progress, I anticipate completion of my research project in the late spring/early summer of 2012.

Secondly, and this is entirely my fault, I completely overlooked the fact that the IRB approval for my research project had a 12-month expiration date attached to it. When I went back to look at the original paperwork, I was dismayed to find that the expiration date was August of 2011, but I did notice in the original approval letter that there was an option for an extension. Even though my request is coming in a bit after the 90-day

window, I am requesting that the NCU IRB Committee consider my request for an extension of the approval.

I appreciate your consideration of my request. Please let me know if you require any additional information from me at this time.

Daniel A. Cutrer

IRB EXTENSION APPROVAL

August 26, 2010

Reference: Daniel A. Cutrer
IRB: 2010-08-26-142

Dear Lewis Mustard, (Kenneth Gossett), Dissertation Chair:

On August 26, 2010, Northcentral University approved Daniel's research project entitled, Developing a Homeland Security Curriculum: A Case Study in Outcomes-based Education Using the Delphi Method.

IRB approval extends for a period of one year and will expire on August 26, 2011.

Please inform the Northcentral University IRB when the project is completed.

Should the project require an extension, an application for an extension must be submitted within three months of the IRB expiration date.

In the interim, if there are any changes in the research protocol described in the proposal, a written change request describing the proposed changes must be submitted for approval.

Sincerely,

Dr. Chris Cozby
IRB Committee Chair
Northcentral University

Appendix B:

Introductory e-mail with Informed Consent Form

Dear Homeland Security Colleague,

My name is Daniel Cutrer, and I am a doctoral student at Northcentral University in Prescott Valley, Arizona. I am doing research for my dissertation entitled: *Developing a Homeland Security Curriculum: A Case Study in Outcomes-based Education Using the Delphi Method.* I am requesting your participation in a survey to help develop a "standardized" academic curriculum in Homeland Security (HS). If you choose to participate, you will be part of a team of subject-matter experts from the University and Agency Partnership Initiative (UAPI) who will examine the issue of homeland security/homeland defense to help determine appropriate learning objectives, program-level objectives, and core academic areas in this dynamic field of study.

Project Overview

As you know, since September 11, 2001, the concept of homeland security has developed from a collective national reaction to a new and growing academic discipline. However, to date, there is no nationally acknowledged body that accredits bachelor's degree programs in homeland security. Work is being done across the country on accreditation standards for homeland security degree programs, and my research will hopefully assist in that effort. My project builds on an earlier study (ERAU, 2008), which developed an initial set of educational outcomes, program-level outcomes, and core academic areas for an undergraduate degree in homeland security. My study proposes to follow up on that initial research and present the proposed ERAU HS curriculum to the UAPI membership in order to validate the original study and achieve consensus among a larger population of subject matter experts regarding the elements that should be contained in a curriculum for a homeland security program.

A review of current literature revealed that there are no published, peer reviewed, or generally accepted educational objectives or program level outcomes that define a bachelor's curriculum in homeland security across the educational landscape. Therefore, the main objective of my research is to identify a set of core academic areas of homeland security and a set of program-level outcomes using a panel of homeland security professionals in an on-line, virtual Delphi process. Once the iterative survey process has been completed, and consensus reached, I will then integrate the findings of the panel into a proposed curriculum for a BS in homeland security program, and hopefully, publish the results in a peer-reviewed journal. All participants in the research study will receive a reprint of the final report.

Next Steps

If you choose to participate in the survey, ***please select "reply" and fill in your name/date on the Informed Consent Form*** at the bottom of this e-mail. Once I receive

your return e-mail, within a week, you will receive a follow-up e-mail with a link to a secure website where you may access the Round 1 survey questions via *SurveyMonkey*®. When that first round of the Delphi process is initiated, the function will be to derive consensus on a set of core academic areas in homeland security. Then, the study will move into Round 2 – where consensus will be derived on a complete set of overarching program outcomes and specific program outcomes for each core academic area.

Although this may vary from panelist to panelist, I expect that an estimate of your total time commitment to this project may be roughly six to eight hours over the next two or three months.

Again, thank you for your participation. I am excited about the project, and welcome your input as a subject-matter authority on academic homeland security.

Sincerely,

Daniel A. Cutrer

Informed Consent Form

Developing a Homeland Security Curriculum: A Case Study in Outcomes-based Education Using the Delphi Method

Purpose. You are invited to participate in a research study being conducted for a doctoral dissertation at Northcentral University in Prescott, Arizona. The purpose of this study is to use the Delphi technique to arrive at consensus among a panel of experts as to what elements an undergraduate degree curriculum in Homeland Security (HS) should contain. The study will focus on identifying core academic areas and specific program objectives in homeland security studies. There is no deception in this study. I am interested in your expert opinions and your input as to what knowledge, skills, and abilities graduates of our program should possess to make themselves more successful in the field of HS.

Participation requirements. You will be asked to complete a multi-round on-line survey regarding core academic areas and program-level outcomes that should be in a homeland security undergraduate degree.

Research Personnel. The following people are involved in this research project and may be contacted at any time: Principal Investigator- Daniel Cutrer, e-mail: daniel.cutrer@erau.edu, phone: (386) 209-3570; the Chair of my Dissertation Committee, Dr. Lewis Mustard (e-mail: executivehealthcare@yahoo.com), [now, Dr. Kenneth Gossett] and the Northcentral University Institutional Review Board (IRB), (866-776-0331)..

Potential Risk/ Discomfort. There are no known risks in this study. However, you may withdraw at any time and you may choose not to answer any question that you feel uncomfortable in answering.

Potential Benefit. The direct benefits to you of participating in this research will be the satisfaction of helping to mold academic curricula that may serve to better educate the next generation of homeland security professionals. The results of this study will have academic interest for institutions of higher learning that offer HS degrees.

Anonymity/ Confidentiality. The data collected in this study are confidential, are not associated with you by name, and are only seen by the researchers associated with this project. A major precept of a Delphi study is that the separate members of the panel will remain anonymous, and will not have any direct contact among themselves. This also aids in preserving confidentiality and limits any specter of group think or peer pressure.

Right to Withdraw. Please be advised that you have the right to withdraw from the study at any time without penalty. Additionally, you may omit questions on any of the Delphi rounds if you do not want to answer them.

I have read the above information and understand the conditions of my participation. My signature indicates that I voluntarily agree to participate in the project.

Please return the signed, dated form to my e-mail address listed above.

Signature: _____ Date:_____

Appendix C:

Delphi Round 1 – Survey Instrument

1. Introduction:

Thank you for agreeing to participate in my doctoral research survey project. The survey itself begins on page six; however, the first five pages provide a project overview, a definition of terms, and an explanation of methodology that I believe each participant may find helpful.

The field of homeland security (HS) is a nascent discipline, and as such does not have a national accreditation body to provide a standardized, outcomes-based curriculum for future homeland security professionals seeking university degrees. My qualitative study is designed to identify a set of program-level, learning-based outcomes for an undergraduate degree in homeland security. The research project will use a case study methodology to examine and attempt to validate the results of an earlier, study on homeland security curriculum development (ERAU, 2008).

A consensus driven Delphi technique will be used to survey a purposive, convenience sample of homeland security experts from the University and Agency Partnership Initiative (UAPI) to ascertain their ideas on what elements (i.e., knowledge, skills, and abilities) should comprise an undergraduate degree in HS, and compare the data to the earlier study's results. A psychometric scale survey will be distributed as the final round to gage the respondents' thoughts on broader issues in homeland security development, as well as other elements that might be added to a graduate level HS degree, or subtracted from an associate's level HS degree, to achieve the desired level of knowledge, skills, and abilities a student must have to perform successfully as a homeland security professional in the 21st century.

Since the terrorist attacks of September 11, 2001, the concept of homeland security (HS) has enjoyed widespread interest by the military, the populace, academia, and by both state and federal government. The 2001 attacks led to a scrutiny of procedures and paradigms regarding homeland security which resulted in significant policy changes and reorganization at the highest levels of government. While federal regulations and strategies underwent major change, educators concurrently examined their role in enhancing the knowledge and skills of homeland security professionals in order to effectively respond to the new terrorist threats. What appeared from the outset of this academic self-examination were issues such as (a) the source of tomorrow's HS labor force, (b) the type of training and education this new HS workforce should have, (c) the core areas of knowledge, skills, and abilities (KSAs) an academic degree in homeland security should encompass.

Today, over 300 colleges and universities across the nation offer a certificate, undergraduate, or graduate degree program in homeland security. For the most part, these

academic programs are doing their best to train a cadre of professionals with a depth of knowledge in the various disciplines that constitute the new field of homeland security. However, inasmuch as the concept of homeland security continues to find its way into academia, the fact is that there are currently no national bodies that accredit homeland security programs. Further, a literature review by this researcher reveals that there are no generally accepted or peer-reviewed program-level, learning-based outcomes that define a "standardized" degree in homeland security. Hence, such learning-based outcomes need to be developed empirically and shared among the field of academic homeland security.

Once you are ready, please move on to Round 1 Iteration 1 of the survey, beginning on page six, and provide feedback on what should constitute the core academic areas of a homeland security curriculum.

2. Definition of Terms

The main goal of this research project is to work with subject matter experts to develop an outcomes-based undergraduate degree program in homeland security using the Delphi technique. Hence, the primary aim of this study is threefold: (1) derive consensus as to what the core academic areas of homeland security might be; and (2) to identify a comprehensive set of overarching program outcomes, and (3) to expand these agreed upon overarching program outcomes and core academic areas to propose a set of program-specific standards for undergraduate degrees in homeland security. Additionally, participants will be surveyed to ascertain their views regarding curriculum elements that should be included in associates and graduate degrees.

Definitions:

Overarching Program Level Outcomes (OPO): Statements that describe in general what students are expected to know and be able to do by the time of graduation. Program outcomes refer to the skills, knowledge and behaviors students acquire in their matriculation through the program.
Accredited programs must demonstrate the degree to which students achieve the published outcomes, as well as have a mechanism (usually assessment and evaluation processes) in place to manage the continuous improvement over time in the program that would insure achievement of each outcome.

Program outcomes include traits, skills, abilities, behaviors desired by constituents; they must be able to measure the capabilities of the student and the program; they should be designed by the constituents and the academic program to cover major program components; they should be based on constituent/program consensus of needs and how to satisfy those needs; they must be able to be customized by each academic program as required; and they must be looped for periodic review and continuous quality improvement.

Core academic area (CAA): These are major functional homeland security areas which correspond to an extant academic discipline. Basically, the "building blocks" of an HS

curriculum, these academic areas serve to specific topics that the degree program should cover. The study examines the proposed ten core academic areas of homeland security curriculum (and their associated definitions) that were generated by the initial ERAU 2008 study as follows:

Core Academic Areas (CAA) proposed in the study:
a) Intelligence: The systematic process of collection and interpretation of information in support of national, state or local policy or strategy.

b) Technical Systems: Study of technology and technological systems applied to the practice, disciplines, and policy development of homeland security missions, goals, and objectives.

c) Law and Policy: Legal and policy formulations that provide the basis and direction of homeland security means and objectives.

d) Emergency Management: The process of coordinating available resources to deal with emergencies effectively, thereby saving lives, avoiding injury, and minimizing economic loss. This protection process involves four phases: Mitigation, Preparation, Response, and Recovery.

e) Risk Analysis: A systematic method of identifying the assets (i.e., critical infrastructure) of a system, the threats to those assets, and the vulnerability of the system to those threats in such a way as to be able to rank order threats and their consequences to a system for the purpose of developing appropriate countermeasures.

f) Critical Infrastructure: Systems and assets, whether physical or virtual, so vital to the United States that the incapacity or destruction of such systems and assets would have a debilitating impact on security, national economic security, national public health or safety, or any combination of those matters PATRIOT ACT (Sec. 1016(e)).

g) Strategic Planning: The process of defining an organization's strategy (a long term plan of action designed to achieve a particular goal or objective) or direction and making decisions on allocating its resources to pursue this strategy, including its capital, its technology and its human resources.

h) Terrorism Studies: Critical analysis of the origins, goals, and ideologies of "...the unlawful use of force and violence against persons or property to intimidate or coerce a government, the civilian population, or any segment thereof, in furtherance of political or social objectives" (28 C.F.R. Section 0.85).

i) Transportation Security: Systems, assets, threats, and countermeasures pertaining to security in all modes of public transportation: air, maritime, rail, highway, pipeline, and mass transit. Includes the governmental organizations responsible for the security of people and property while being transported by intermodal transportation systems, as well as the federal regulations governing security in these modes of transportation.

j) Environmental Security: A process for effectively responding to changing environmental conditions that have the potential to destabilize the political economy or governmental infrastructure of a nation or region which reduces peace and stability and thereby affects U.S. national security.

3. The Delphi Method

The Delphi method is based on a structured process for collecting and distilling knowledge from a group of experts by means of a series of questionnaires interspersed with controlled opinion feedback. Delphi represents a useful communication device among a group of experts and thus facilitates the formation of a group judgment. The Delphi method has been developed in order to make discussion between experts possible without permitting a certain social interactive behavior as happens during a normal group discussion and hampers opinion forming. The Delphi method has been widely used to generate forecasts in technology, education, and other fields.
The technology forecasting studies which eventually led to the development of the Delphi method started in the 1940s. In 1946, a Project RAND (an acronym for Research and Development) began a study on the "broad subject of intercontinental warfare other than surface." In 1959 RAND researchers published a paper on "*The Epistemology of the Inexact Sciences*," which provides a philosophical base for forecasting. The paper argued that in fields that have not yet developed to the point of having scientific laws, the testimony of experts is permissible. The problem is how to use this testimony and, specifically, how to combine the testimony of a number of experts into a single useful statement. The Delphi method recognizes human judgment as legitimate and useful inputs in generating forecasts. Single experts sometimes suffer biases; group meetings suffer from "follow the leader" tendencies and reluctance to abandon previously stated opinions. In order to overcome these shortcomings the basic notion of the Delphi method, theoretical assumptions; and methodological procedures were developed, and are a suitable research methodology for this study.

The Basics of the Delphi Method

The Delphi method is an exercise in group communication among a panel of geographically dispersed experts. The technique allows experts to deal systematically with a complex problem or task. The essence of the technique is fairly straightforward. It comprises a series of questionnaires sent either via computerized systems, to a preselected group of experts. These questionnaires are designed to elicit and develop individual responses to the problems posed and to enable the experts to refine their views as the group's work progresses in accordance with the assigned task.
The main point behind the Delphi method is to overcome the disadvantages of conventional committee action. Anonymity, controlled feedback, and statistical response characterize Delphi. The group interaction in Delphi is anonymous, in the sense that comments, forecasts, and the like are not identified as to their originator but are presented to the group in such a way as to suppress any identification.

In the original Delphi process, the key elements were (a) structuring of information flow, (b) feedback to the participants, and (c) anonymity for the participants. Clearly, these characteristics may offer distinct advantages over the conventional face-to-face conference as a communication tool. The interactions among panel members are controlled by a panel director or monitor (researcher) who filters out material not related to the purpose of the group. The usual problems of group dynamics are thus completely bypassed.

4. Basic Guidelines for Round 1:

The main purpose of this round is to derive consensus on a set of core academic areas (CAA) for an undergraduate degree in homeland security. To begin, let us all proceed with a uniform understanding of the term homeland security. According to the National Security Strategy (October, 2007): Homeland security is: a concerted national effort to prevent terrorist attacks within the United States, reduce America's vulnerability to terrorism, and minimize the damage and recover from attacks that do occur.
Next, we must define core academic areas (CAA) of homeland security. For the purpose of this study, we shall consider core academic areas of homeland security as the major functional areas of homeland security which correspond to an extant academic discipline. The ten CAA's listed below, with definitions, were originally developed from the initial ERAU study in 2008, and need to be validated and vetted today, using a larger survey population – the UAPI membership.
Steps in Round 1, Iteration 1:

1. Consider and evaluate the following set of proposed core academic areas (CAA) for an undergraduate degree in homeland security. Then decide whether each listed core academic area should be kept as worded, or, kept with edits, or whether it should be eliminated and check the appropriate box. At the end of the CAA list, are blank forms where you may offer your own additional CAA(s) for consideration, again with comments and/or rationale.

2. Please do not skip any of the questions, making sure you choose an answer for each one. If you decide to retain a specific CAA, but wish to submit changes to the proposed definition of each CAA, please offer your editorialized definition of the CAA in the comments box. Please contribute comments and/or rationale for each change to a proposed CAA as appropriate.

3. Please complete Round 1, Iteration 1 within 10 business days of receiving the email with the link to the survey.