

## **The Benefits and Challenges of Integrating Emergency Management and Homeland Security into a New Program**

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### **ABSTRACT**

This paper argues that homeland security and emergency management education programs in higher education must be a collaborative and integrated endeavor involving multiple disciplines because of the complexity of the homeland security enterprise. Looking at the homeland security enterprise through a variety of perspectives, taken together and synthesized, can deepen understanding and shed additional light on the scope of the field or discipline. Next, this paper provides an example of a graduate program at Texas A&M University–Corpus Christi that has integrated EM and HS components into the curriculum. Finally, this paper highlights both the benefits and challenges of an interdisciplinary approach to EM–HS education.

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On May 22, 2011, the deadliest single tornado in nearly sixty years leveled 30% of Joplin, Missouri. This EF5 tornado killed 124 people and destroyed an estimated 8,000 buildings (ABC, 2011). In the past year, the U.S. not only faced deadly spring tornadoes, but also unprecedented triple-digit heat, devastating droughts and record setting wildfires in Arizona and New Mexico. In 2011, the U.S. had a record ten weather catastrophes costing billions of dollars including: five separate tornado outbreaks, two major river floods in the Upper Midwest and the Mississippi River, drought in the southwest, a blizzard that crippled the Midwest and Northeast, and Hurricane Irene that cost the nation between \$7–10 billion (Borenstein, 2011). While individual weather disasters cannot be directly attributed to global warming, it is a factor in the magnitude and the string of many of the extremes (Rahmstorf & Coumou, 2011; Hanson, Sato, & Ruedy, 2011, IPCC, 2012).

For homeland security and emergency management professionals of the future, global climate change and its negative impacts may be the most significant threat that we face as a nation. According to the Intergovernmental Panel on Climate Change (IPCC), “warming of the climate system is unequivocal, and is now evident from observations of increases in global average air and ocean temperatures, widespread melting of snow and ice, and rising global average sea level” (2007, p.1). The regional impacts reported by IPCC include the very likely increase in the frequency of hot extremes and heat waves, likely increase in tropical cyclone activity, and likely decrease in water availability in semiarid regions thus increasing the number of droughts and exposing hundreds of millions of people to increased water stress (IPCC, 2007). This combination of drought,

floods and a lack of fresh water may cause significant global instability and conflict in the coming decades, as developing nations try to meet demand from exploding populations while dealing with the effects of climate change according to U.S. intelligence agencies (Office of the Director of National Intelligence, 2012). The Intelligence Community Assessment on Global Water Security reports:

During the next 10 years, water problems will contribute to instability in states important to U.S. national security interests. Water shortages, poor water quality, and floods by themselves are unlikely to result in state failure. However, water problems—when combined with poverty, social tensions, environmental degradation, ineffectual leadership, and weak political institutions—contribute to social disruptions that can result in state failure (Office of the Director of National Intelligence, 2012, p. iii).

Fluctuating water availability and relative scarcity of natural resources have been cited by scholars as factors in political conflict, acts of terrorism and wars between nation states (Homer-Dixon, 1994; Maxwell & Reuveny, 2000; Chalecki, 2002; Theisen, 2008; Mathew, Barnett, McDonald & O'Brien, 2010). The report on Global Water Security further states that “water terrorism,” attacks by extremists, terrorists and rogue states against critical water infrastructure, including dams, will become more likely beyond the next ten years (Office of the Director of National Intelligence, 2012). Even if such attacks were not successful, the fear of the loss of water resources would likely cause governments to make costly investments to protect water infrastructure.

These threats and events clearly highlight the complexity and interdependencies of modern society that make us enormously vulnerable, whether it is to natural or man-made disasters. Our ability to manage the risks of extreme events and to prevent, mitigate, plan, respond to and recover from a broad range of disasters in the future will be determined in large part by the quality of our local, state and national emergency management systems, homeland security policies and programs, and education of our future emergency management and homeland security professionals. The success of the homeland security enterprise is dependent on our ability in higher education to work collaboratively across disciplines to design, develop and teach a curriculum that prepares professionals across the entire domain of homeland security (including emergency management), and to conduct research that serves to enhance our understanding of the complexity of the homeland security enterprise.

This paper will argue that homeland security (HS) and emergency management (EM) education programs in higher education must be a collaborative and integrated endeavor involving multiple disciplines because of the complexity of the homeland security enterprise. Looking at the homeland security enterprise through a variety of perspectives, taken together and synthesized, can deepen understanding and shed additional light on the scope of the field or discipline. Next, this paper will highlight both the benefits and challenges of

multidisciplinary and interdisciplinary approaches to EM–HS education. Lastly, this paper will provide an example of a graduate program at Texas A&M University–Corpus Christi that has integrated EM and HS components into the curriculum.

**Defining homeland security.** In order to build educational programs for the homeland security enterprise it is important to have a clear understanding of how the Department of Homeland Security and the Obama administration envision homeland security. The *Quadrennial Homeland Security Review Report (QHSR)* is the nation’s first QHSR and its purpose is to set forth a shared vision of homeland security in order to achieve a unity of purpose (U.S. Department of Homeland Security, 2010). The QHSR describes homeland security as the “intersection of evolving threats and hazards with traditional governmental and civic responsibilities for civil defense, emergency response, law enforcement, customs, border patrol, and immigration” (U.S. Department of Homeland Security, 2010, p. vii). This vision of homeland security assumes that all of these responsibilities that include both emergency management and homeland security will be seen under one overarching concept of the homeland security enterprise that recognizes the need for joint actions and efforts across previously discrete elements of government and society. The QHSR further describes homeland security as a national enterprise:

Homeland security is a widely distributed and diverse—but unmistakable—national enterprise. The term “enterprise” refers to the collective efforts and shared responsibilities of Federal, State, local, tribal, territorial, nongovernmental, and private-sector partners—as well as individuals, families, and communities—to maintain critical homeland security capabilities (U.S. Department of Homeland Security, 2010, p. viii).

The QHSR clearly does not subscribe to a traditional view of homeland security which was primarily focused on preventing and responding to terrorism, but rather one that encompasses an all-hazards approach that recognizes the value of emergency preparedness structures and processes (Bellavita & Gordon, 2006). This dual role of the homeland security enterprise is further emphasized in the QHSR’s missions that are not limited to the Department of Homeland Security, but also the responsibility of hundreds of thousands of people across all levels of government, the private sector and nongovernmental organizations (U.S. Department of Homeland Security, 2010). The missions include: preventing terrorism and enhancing security, securing and managing our borders, enforcing and administering our immigration laws, safeguarding and securing cyberspace, ensuring resilience to disasters through hazard mitigation, and effective emergency preparedness, response and recovery efforts. Clearly these definitions and missions see emergency management and homeland security not as separate fields or practices, but rather as being interdependent critical components of the homeland security enterprise.

To be successful in accomplishing these missions, homeland security professionals in the public and private sector must have a clear sense of what it takes to achieve this overarching vision, as well as the knowledge, skills and abilities to achieve national, state and local homeland security goals. In order to prepare professionals to serve within the homeland security enterprise, it will be necessary to provide them with the knowledge and skills to perceive, analyze and respond to disasters and crises from multiple perspectives and paradigms (Drabek, 2007; Waugh & Sadiq, 2011; Bellavita, 2008). Our challenge as homeland security and emergency management scholars is developing and implementing undergraduate and graduate curriculum that is not only grounded in a set of core competencies, but also continually adapting to future threats, hazards, risks and vulnerabilities. This can most effectively be achieved by designing, developing and implementing multidisciplinary or interdisciplinary homeland security–emergency management degree programs at our colleges and universities.

**Interdisciplinary learning: benefits & challenges.** The first decade of the 21<sup>st</sup> century has been filled with tumultuous events—the terrorist attacks on the U.S. and the global war on terror, catastrophic disasters such as Hurricane Katrina and the Deep Water Horizon oil spill, and the financial crisis of 2008—that highlighted our vulnerabilities and interdependencies, as well as our inability to find long term solutions to complex problems. In order to deal with these issues, professionals need to be able to critically analyze, conceptualize, and synthesize knowledge and to reach conclusions on the basis of ambiguous information (Tynjala, 2006; Burton, 2012). In response, higher education is increasingly called on to educate individuals to become capable of dealing with such complex issues in scientific and professional environments (Jacobson and Wilensky, 2006; Lattuca, Voight, & Fath, 2004; Parker, 2002). Public administrators, particularly those in emergency management and homeland security, are increasingly confronted with complex issues that require them to think holistically from multiple perspectives in order to identify solutions. Interdisciplinarity can help to address today’s complex issues since it is believed that this approach facilitates a comprehensive understanding (Newell, 2007; Lattuca, 2002; Aboelela, Larson, Bakken, Carrasquillo, Formilcola, & Glied, 2007). The primary motivations in this movement toward interdisciplinarity are the beliefs that interdisciplinary work provides for a more educated individual appreciative of the universal nature of knowledge, and that only interdisciplinary work can address the modern, complex problems facing human society (Nissani, 1997; Salter and Hearn, 1997; Davies & Devlin, 2007; Fallows, 2009 ). Although the motivation for interdisciplinary endeavors may vary, the goal is often the same—the integration to some degree between various disciplinary bodies of knowledge (Newell, 1992, Boix Mansilla, 2000; Klein, 1990; Lattuca, 2002; Parker, 2002; Aboelela et al, 2007).

**Defining interdisciplinary.** The term interdisciplinary is used increasingly in the rapidly changing context of higher education (Fallows, 2009; Haynes, 2002; Parker, 2002). Interdisciplinary education has been in higher education for over

40 years and has been defined in a number of ways. Carter Good, in his *Dictionary of Education*, defined the interdisciplinary approach as: “A method of study by which experts, or the best research workers from many different fields of learning, are brought together in the examination of a particular problem that is relevant to all their approaches” (1973, p. 311). The Organization for Economic Cooperation and Development defined interdisciplinary as: “An adjective describing the interactions among two or more different disciplines. This interaction may range from simple communication of ideas to the mutual integration of organizing concepts, methodology, procedures, epistemology terminology, and organization of research and education” (Mayville, 1978, p. 9). Klein and Newell (1996, p. 395) define interdisciplinarity as:

A process of answering a question, solving a problem, or addressing a topic that is too broad or complex to be dealt with adequately by a single discipline or profession... Interdisciplinary studies draw on disciplinary perspectives and integrate their insights through construction of a more comprehensive perspective.

Boix Mansilla (2000, p. 219) proposed the following definition of interdisciplinary understanding,

The capacity to integrate knowledge and modes of thinking in two or more disciplines or established areas of expertise to produce a cognitive advancement—such as explaining a phenomenon, solving a problem, or creating a product—in ways that would have been impossible or unlikely through single disciplinary means.

True interdisciplinarity uses and integrates multiple methods, approaches and theories. It requires that we build into our EM–HS programs a comprehensive framework for organizing knowledge, directing enquiry, and communicating with others. To be effective in analyzing and resolving the complex problems we face in the homeland security enterprise, an interdisciplinary approach should provide the tools to clarify the observer’s standpoint, define and orient to a problem, map the full social and decision-making context, and apply multiple methods to generate, evaluate and implement solutions (Lattuca, 2002; Rutherford, Gibeau, Clark, & Chamberlain, 2009). To develop these frameworks, interdisciplinary courses are normally team developed by faculty from different disciplines. Faculty learns the perspectives of the other disciplines through readings for the course and weekly meetings to discuss course content, learning objectives, and assessment tools. Interdisciplinary teaching requires an informed appreciation of the perspective of other disciplines, not expertise in their full range of concepts, theories and methods (Aboelela et al., 2007; Davies & Devlin, 2007; Newell, 1992). Interdisciplinary courses extract the world view or perspectives embedded in each of the disciplines included, comparing them and ferreting out their underlying assumptions when they conflict, and then integrating them into a broader more holistic perspective (Newell, 1992; Harris & Holley, 2008). This process of integration is critical to interdisciplinary teaching and is a major goal of interdisciplinary education (Newell, 1992; Klein, 1990; Smith & McCann, 2001; Szostak, 2007).

Conceptions of interdisciplinarity can be put on a continuum according to the degree of interaction that individuals have beyond a single disciplinary community; the degree of integration between bodies of knowledge typically associated with a specific discipline; and the shared purpose, problem, or topic that drives collaborative behavior. The focus here is on three variations of knowledge production that extends across disciplinary boundaries, including cross-disciplinarity, multidisciplinary, and interdisciplinarity.

Cross-disciplinary refers to efforts to view one discipline from the perspective of another, often subordinating the phenomenon from one discipline to another (Davis, 1995; Davies & Devlin, 2007). In cross-disciplinary, a topic normally outside a field of study is investigated with no cooperation from others in the area of study concerned. Scholars turn to other related disciplines to borrow those constructs that enable greater understanding. A key element of cross-disciplinarity is the lack of integration between the existing discipline and the borrowed epistemological constructs; that is, no effort is made to create a new paradigm that can be applied to similar problems or situations (Davies & Devlin, 2007; Lattuca, 2001; Aboelela et al., 2007). Engagement with a related discipline is tightly coordinated and limited to whatever tools or concepts that can be best applied to the immediate problem. Klein (1993) argued that cross-disciplinary work is a common element of academic behavior across all disciplines, noting that innovative scholars increasingly cross the borders of formal disciplines for the sake of enhancing disciplinary knowledge, better understand phenomenon relevant to their research, and to borrow research methods to enhance data collection and analysis in their own areas.

Multidisciplinary is defined as “research, problem solving or teaching that mingles disciplines but maintains their distinctiveness” (Haynes, 2002, p. 76). It also refers to the involvement of several different professional areas, though not necessarily in an integrated manner (Shafritz, Koeppe, and Soper, 1988; Aboelela et al., 2007; Davies & Devlin, 2007). Multidisciplinary refers to several disciplinary specialists working side by side in an additive way with no integration of their disciplinary perspectives (Davis, 1995; Lattuca, 2002; Davies & Devlin, 2007). Multidisciplinary efforts do not require this level of communication and integration because it is merely the juxtaposition of various disciplines with little or no connection between them in a program (Mayville, 1978; Smith & McCann, 2001; Davies & Devlin, 2007). In multidisciplinary curriculum, perspectives are presented without any support for the integration of disciplinary knowledge throughout the curriculum.

As opposed to the integrative synthesis that characterizes interdisciplinarity, multidisciplinary works occur in an additive, parallel framework. In higher education, multidisciplinary is most commonly associated with the undergraduate curriculum (Davies & Devlin, 2007; Rutherford, et al., 2009; Lattuca, 2002). In multidisciplinary programs students specialize in one discipline such as sociology, public administration or political science, but can study several

others over the course of a typical degree program. Programs or modules where students select from a menu of courses or classes from different departments, or where subject specialists are drafted to provide input in a range of areas relevant to the overall program would be considered a multidisciplinary approach. For example, in the Master of Public Administration program at Texas A&M University–Corpus Christi, graduate students can specialize in homeland security where they take foundational courses in public administration, homeland security and emergency management as well as elective courses in cybersecurity and information assurance from the Department of Computing Sciences; and hazardous materials management and oil spill management from the Department of Environmental Sciences. In this program, teachers often integrate various disciplinary perspectives in each course, but there is no integration between courses, and each faculty member teaches their course from their own disciplinary perspective. This example—like many other homeland security and emergency management programs that have been developed across the U.S.—represents a multidisciplinary approach.

The advantages of multidisciplinary approaches are that they are not only much easier to develop, implement and evaluate, but also they still allow faculty and students to look at a topic or question from multiple perspectives and disciplines (Hursch, Haas, & Moore, 1983; Davis, 1995; Szostak, 2007). Looking at the homeland security enterprise through a variety of lenses within a course allows students to look at problems in a more holistic way and perceive the connections between seemingly unrelated issues or domains (Kiltz, 2011). Although students and faculty are exposed to multiple perspectives in this approach, faculty teaches from the disciplinary framework in which they were educated, and research and publishes within the purview of their discipline.

Although multidisciplinary programs are relatively easy to coordinate and implement, students do not always find the programs easy to navigate (Kusmieriek & Piotek, 2002; Parker, 2002). While students are able to experience learning from different disciplinary approaches, there tends to be little synthesis across disciplinary perspectives to the nature of the program of which they are a part (Lalicker, 1998; Parker, 2002; Aboelela et al., 2007; Rutherford et al., 2009). If a learning outcome for multidisciplinary courses/programs is for students to synthesize concepts, theories, and principles, then faculty must teach students to first recognize the different insights that flow from different disciplinary perspectives and then provide them with the tools for resolving these conflicts (Parker, 2002; Szostak, 2007). Instead of learning one or two theories or methods in detail, students should learn the essence of several and how these might be integrated. The rigor in interdisciplinarity can only come from knowing how, why and what to integrate (Smith & McCann, 2001; Lattuca, 2002; Szostak, 2007).

This lack of integration is a major weakness of most multidisciplinary programs. The major strength of interdisciplinary education is the high level of integration that is possible across two or more disciplines. However, if interdisciplinary

courses are not well integrated or do not adequately develop the skills necessary to do interdisciplinary learning, students may have problems working across disciplines, working in different disciplines, and synthesizing different disciplines (Fallows, 2009; Smith & McCann, 2001). This poses difficulties for the development of interdisciplinary thinking in interdisciplinary courses. These student problems may be caused by disciplinary differences in epistemologies, discourses and ways of teaching (Bradbeer, 1999; Davies & Devlin, 2007; Parker, 2002).

Effective interdisciplinary work integrates knowledge from multiple fields of study to engage in a shared research question or topic. Implicit in the advocacy for interdisciplinary learning is the belief that experiences offer advantages to students that traditional disciplinary learning does not. Advocates of interdisciplinary learning in higher education make persuasive arguments for the provision of formal opportunities for learning that crosses subject boundaries in university curriculum (Newell, 1994; Huber, 2002; Invariantitskaya & Clark, 2002; Lattuca, Voight, & Fath, 2004; Repko, 2008; Fallows, 2009; Klein, 1990). These arguments include: (1) the educational benefits of engaging critically with one's own discipline by viewing its limitations from another perspective; (2) the fact that modern working patterns increasingly call for multi-professional teamwork and collaboration; (3) it fosters a problem-focused integration of information with more complex knowledge structures; (4) enhances critical thinking, creativity, and thinking and learning skills; and (5) provides a holistic approach in understanding complex problems such as terrorism, climate change and pandemics. While there are a number of benefits of interdisciplinary teaching, there are also a number of challenges that must be considered before designing and developing interdisciplinary homeland security and emergency management programs.

***Challenges of interdisciplinary teaching.*** Perhaps the greatest challenge to the implementation of interdisciplinary homeland security and emergency management programs is overcoming the traditional ways that academic disciplines are perceived in higher education. Academic disciplines have long organized the basic structure of American higher education. Through organizational socialization, beginning during graduate education and continuing into the faculty career, professors experience academic life within disciplinary boundaries. The traditional view of an academic discipline is an area of study “with its own theories, methods and content...with its distinctiveness being recognized institutionally by the existence of distinct departments, chairs, courses and so on” (Squires, 1992, p. 202). The discipline provides the academic's primary cognitive, social and cultural tools through which to organize and extend knowledge. A discipline has also been described as providing the ‘structure of knowledge’ that trains and socializes members of a faculty (Beyer and Lodahl, 1976; Parker, 2002; Latucca, 2001). Becher (1989) described individual disciplines as academic tribes that subscribe to unique sets of norms and values directly linked to fields of study and scholarly agendas and practices. Davies and



Devlin created an expanded list of characteristics that includes “a community of scholars; a tradition or history of inquiry; a mode of inquiry that defines how data is collected and interpreted, as well as defining the requirements for what constitutes new knowledge; and the existence of a communications network” (2007, p. 2). These definitions suggest that disciplines serve as a cognitive construct as well as an organizational unit. As a cognitive structure, the discipline offers interrelated epistemological assumptions that scholars use to understand the world around them. Students must master not only the basic concepts that organize the discipline but also how these concepts relate to each other and the language needed to express such understanding (Aboelela et al., 2007; Davies & Devlin, 2007; Primeau, 2002).

The discipline also serves as an organizational unit in the university structure. In the vast structure of contemporary higher education, disciplines are constructed as academic departments clustered together in separate colleges—science, engineering, arts and humanities, for example. Universities organize their most basic function (the transfer of knowledge and awarding of degrees) through the department; graduate education is manifested as a departmental function; new faculty is hired based on their qualifications in the discipline; and faculty are promoted and rewarded based on their teaching and research within their department and discipline.

It is the constraints of the traditional academic discipline and organizational structure and culture of higher education that often make it difficult for even those faculty members who genuinely seek to work together to achieve interdisciplinarity in their programs and courses. For example, innovative junior faculty with new ideas and energy may be interested in moving homeland security programs toward interdisciplinarity, but they simply do not have the time, resources, or influence to effect significant change. Faculty involved in interdisciplinary teaching repeatedly emphasize the time requirements of successful interdisciplinary efforts (Krometis, Clark, & Gonzales, 2011; Rutherford et al., 2009; Lattuca, 2002). Faculty report having to spend time designing and developing a new class by learning the tenants of other disciplines, brainstorming and preparing course materials, refining the course structure, working in a team environment and establishing assessment criteria to specific learning objectives (Smith & McCann, 2001; Lattuca, 2002).

Interdisciplinary course development takes time; thus, institutions should consider providing release time during the school year or a summer stipend for faculty preparing new interdisciplinary courses to read outside their discipline and discuss readings with one another (Newell, 1992; Lattuca, 2002; Aboelela et al., 2007). Fallows (2009) found that there are on-going challenges in organizing and performing the work because faculty may not have skills in professional collaboration, consensus building, and curriculum development. Some of these problems in team teaching could be mitigated through the use of organizational research centers, interdisciplinary special interest programs, creation of learning

communities, and cross campus seminars (Klein & Porter, 1990; Harris & Holley, 2008).

The commitment of time and energy required into understanding other disciplines invariably detracts from maximizing one's own mastery of a single discipline and may serve as a disincentive to interdisciplinarity (Naiman, 1999; Applebee, 2007; Rutherford et al., 2009). According to Applebee (2007, p. 103) interdisciplinary programs often fail because they "require time and resources that are not readily available, are often superficial, and easily degenerate, with one of the integrated subjects dominating the curriculum at the expense of others." Interdisciplinary scholars who occupy roles that are inherently structured around two or more professional sets of norms and values face uncertainties that emerge at the intersection of otherwise disconnected academic cultures. A constraint that may be felt early on in the implementation of a program, involves the negotiation of standards among faculty from different disciplines or different departments and colleges within a university. The faculty members involved come from different disciplinary traditions with conflicting expectations as to what the standards should be for student evaluation in courses, theses, and comprehensive examinations. These uncertainties sometimes act as disincentives to academics who might otherwise engage in interdisciplinary work.

In Lattuca's 2001 study, professors engaged in interdisciplinary work reported an overall sense of lacking a collegial home and, consequently, an overall reduction of morale and confidence. Faculty members at all levels may be concerned that interdisciplinary work will result in feelings of detachment from the more distinct and traditional disciplinary communities within which they have been professionally socialized (Hart & Mars, 2009; Lattuca, 2001). For example, Hart & Mars (2009) found that interdisciplinary science educators felt an extra burden to be both a bridge between two academic cultures and an advocate for every aspect of their professional work. These faculty members felt compelled to pave their own way and justify the work they do to their colleagues and promotion and tenure committees.

This lack of confidence may be reinforced by academic policies, both institutionally and within the norms of faculty work more broadly, which differentiated interdisciplinary teaching and scholarship from scholarship rooted in discipline specific discovery (Lattuca, 2001; Boardman & Ponomarov, 2007). For example, the tenure process pushes junior faculty to focus on publishing as much as possible in the most prestigious journals, and they are more likely to be successful at this if they do narrow work within their own disciplines. Over time these potential innovators may become resigned to the status quo because faculty performance is primarily judged in terms of conventional standards, such as the number of peer-reviewed papers published, rather than the amount of student progress and awareness that is achieved, or other more appropriate but difficult-to-measure indicators.

Given the challenges of interdisciplinary education, such an approach to homeland security and emergency management educational programs may be difficult to achieve without institutional support (Ackerman & Perkins, 1989; Davis, 1995; Lattuca, 2002; Repko, 2008; Hart & Mars, 2009). It is not enough for the university to espouse support for faculty engagements in interdisciplinary endeavors. Rather, key changes to hiring policies, tenure and promotion review, and the structure of colleges and departments affirm an interdisciplinary commitment (Jaschik, 2008; Smith & McCann, 2001; Aboelela et al., 2007). First, universities and departments must hire faculty interested in integrating interdisciplinary approaches into the curriculum. This need requires a shift in the historical nature of faculty hiring as a discipline-based process that is accomplished through academic departments. This tradition encourages the creation of a community of scholars with shared interests, who can contribute to departmental growth. A method by which interdisciplinary faculty can be hired would be to utilize a university or college-wide hiring committee with the goal of bringing interdisciplinary scholars to the institution (Jaschik, 2008; Lattuca, 2001).

Beyond hiring new faculty engaged in interdisciplinary scholarship, however, universities must ensure a method by which their work can be fairly assessed. Faculty work is assessed by a community of peers who have knowledge of the journals, conferences, and research topics relevant to the field. A long-standing concern for faculty is the relationship between interdisciplinary scholarship and tenure review (Lattuca, 2001; Fallows, 2009; Hart & Mars, 2009). “Disciplinary structures can impede interdisciplinary scholarship, and faculty members are sometimes dissuaded from pursuing interdisciplinary work by fears of unfavorable reviews from colleagues” (Lattuca, 2001, p. 168). The fragmented nature of knowledge makes a complete assessment of interdisciplinary scholarship by the traditional tenure process difficult to achieve, thus universities should determine how to alter the process of tenure review in a manner that acknowledges the complexity of faculty interdisciplinary work.

For interdisciplinary change to occur in higher education—and in homeland security and emergency management programs, in particular—efforts need to be made on multiple institutional levels. To most effectively integrate emergency management and homeland security specializations requires reshaping institutional behavior, including its goals, boundaries, and activities that results in an environment where interdisciplinary scholarship is supported and valued. At Texas A&M University–Corpus Christi (TAMUCC), there is minimum support by faculty and administrators for interdisciplinary teaching and learning, thus this program is an example of how homeland security and emergency management theories, concepts and principles can be integrated into an effective multidisciplinary program.

**HS–EM Graduate Certificate at TAMUCC.** The Graduate Certificate in Homeland Security at TAMUCC is a multidisciplinary, 15-credit program housed

in the Master of Public Administration program within the College of Liberal Arts. The curriculum was designed and developed based on a study conducted from 2008–2009 (Kiltz, 2009). The purpose of this study was to ask subject matter experts in emergency management and homeland security what would constitute a set of core academic areas that would be the intellectual core that would serve as the foundation for graduate students in this field, and what would be the competencies students should have when they complete this program (Kiltz, 2009). The twelve subject-matter experts included local, state and federal homeland security and emergency management professionals in midlevel management or executive-level positions with extensive educational credentials (Kiltz, 2009). The Delphi technique was employed with an online survey instrument that proceeded in rounds that included several iterations per round as a means to develop a consensus among the SMEs (Okoli & Pawloski, 2004). In this study, eight core academic areas that were identified for graduate studies in homeland security included: Overview of Homeland Security (included policies, strategies, organizations, theories and practices), Terrorism and Counterterrorism (history of global terrorism, types of terrorism, counterterrorism theories, activities and organizations); Emergency Management (included all hazards approach to disasters and understanding all four phases of EM); Law and Policy (legal and constitutional principles, case law, civil rights issues, and administrative law); Public Management & Leadership (included intergovernmental relations, interagency communication, theories and practices of public administration, budgeting and personnel management, and ethics), Strategic Planning, Technology (included cyber security, GIS, communications systems, emerging new technologies in the field); and Risk and Vulnerability Assessment and Analysis (included how to do quantitative and qualitative research to do these tasks) (Kiltz, 2009).

From an analysis of previous studies in homeland security and emergency management education, as well as the results of this research, a draft list of core functions and competencies for graduate programs in homeland security was created (See Table 1) and integrated with core competencies for graduate programs in emergency management (Table 2) (Blanchard, 2003, 2004, 2005, 2009; Cwiak, 2011; Waugh, 2000; Thomas & Miletti, 2003; O'Connor, 2005; Reddy, 2000; Rollins & Rowan, 2007; Ramsay, Cutrer & Raffel, 2010; Polson, Persyn, & Cupp, 2010; Kiltz, 2009). In comparing Table 1 to Table 2 on the listed core competencies in emergency management and homeland security graduate programs, there are a number of areas of overlap that could be integrated into a comprehensive multidisciplinary or interdisciplinary homeland security and emergency management graduate program or specialization including research and analytical methods, political and organizational contexts, policy, legal and regulatory aspects, management, leadership and communication, and technology and its application. This type of integration is demonstrated in the graduate certificate in homeland security at Texas A&M University–Corpus Christi (TAMUCC).

**Table 1**

**Core Functions and Competencies—Graduate Level in HS**

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- 1 *Current and emerging threats*, including: terrorism, manmade and natural disasters, chemical, biological and radiological, etc. Includes understanding the history of various threats and hazards, the risks and vulnerabilities associated with each, and the social, cultural, psychological, political and operational dynamics of threats.
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- 2 *Political and organizational context of homeland security*, including: homeland security policy and strategy at the state and national level, roles and responsibilities of each level of government, specific government organizations, private sector, nonprofits and the public in the homeland security enterprise. Includes understanding political processes, political theory and culture as well as organization theory and behavior.
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- 3 *Legal and regulatory aspects of homeland security*, including: public and administrative law, regulatory processes, policy making and rule making processes, and civil rights issues.
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- 4 *Management and leadership*, including: management techniques, ethics, financial management, human resource management, data and information, interagency coordination and communication and crisis decision making particularly within public organizations. Includes understanding the theories and practices of public administration.
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- 5 *Technology and its application*, including: information technology and systems, sensors, geographic information systems, decision making software, data management systems, cyber infrastructure and security, radio communications, system integration and compatibility, and surveillance and monitoring systems.
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- 6 *Research and analytical methods*, including: quantitative and qualitative methods, program evaluation, needs assessment, threat, risk and vulnerability assessments, and hazard assessments.
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**Table 2**

**Core Functions and Competencies—Graduate Level in EM**

1	Research methods (research design, quantitative and qualitative methods)
2	Analytical methods (needs assessment, public policy analysis, program evaluation, risk assessment, hazard analysis)
3	Dimensions of emergency management practice (historical, phases of emergency management, international and comparative, types of hazards or threats)
4	Political context of emergency management (political culture, stakeholders, political theory, government organization, political process)
5	Legal and regulatory aspects of emergency management (public law, administrative law, public policy making process, regulatory process)
6	Technology and its application (computers, geographic information systems, telecommunication systems, systems interoperability)
7	Planning theory (land use planning, urban planning, program development and implementation)
8	Organization theory (leadership, interorganization relations, interagency dynamics, decision making, community relations)
9	Communication theory (media relations, intra and interorganizational)
10	Management theory (management techniques, ethics, financial management, human resource management, data and information, grants)

*Note:* Breakout Session at the 2004 Higher Education Conference, Federal Emergency Management Agency, Emergency Management Institute, (Brown, 2004).

The TAMUCC study not only determined if there was an interest and need for a graduate level program in homeland security–emergency management in South Texas, but also resulted in the development of the guiding principles, student learning outcomes, types of courses to be offered and the method of course delivery (classroom, distance education, or hybrid). The key learning outcomes for students that were established for this program included:

1. Demonstrate an understanding of mitigation, preparedness, response and recovery strategies for a broad range of natural, technical and man made hazards.

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2. Design and modify plans and programs at federal, state, and/or local levels to reflect the evolving strategic policy issues associated with a statutory and presidential direction for the homeland security enterprise.
3. Analyze terrorist groups' proclivities in order to forecast the risks, types, and orders of magnitude of terrorist threats most likely to confront the nation—state, our state and our region.
4. Develop policies, procedures, and protocols to allow seamless agency integration from prevention to incident response and recovery scenarios.
5. Recognize the multidisciplinary nature of homeland security and emergency management functions and be able to assess and integrate various functional areas.
6. Conduct applied research or service learning projects in collaboration with local government or nonprofit organizations involved in the homeland security enterprise.

These program student learning outcomes are overarching learning outcomes that describe learning obtained across multiple courses in the curriculum. Program student learning outcomes are broad descriptions of what students will be able to know, what they will be able to do, or how they will think about the discipline or approach problem solving after they finish your program. Although these outcomes are broad and general, they must still be written in language that clearly implies a measurable behavior or quality of work.

Three guiding principles informed the design of this certificate program. First, an all hazards emergency management model is taught that stresses the need for a conceptually unified approach toward preventing, mitigating, preparing for, responding to, and recovering from natural, man-made and technological disasters.

Second, the program is multidisciplinary in nature in that it consists of courses from a broad range of disciplines. It is recognized that the fields of emergency management and homeland security encompass a broad range of disciplines including public administration, criminal justice, national security, sociology, health, geography, health, political science, computer science, engineering and environmental science. In the TAMUCC program, three core classes are taught within the MPA program and include Homeland Security and Public Administration, Modern Terrorism and Counter Terrorism, and Emergency Management Practicum. In addition to the core classes, students can choose designated courses in any of the three elective tracks—policy and management track, information assurance track and environmental science track. The purpose of the elective track approach is to complement the integrative, multidisciplinary perspective of the core classes with substantive depth in one of these three areas. The courses in the information assurance track are taught by faculty in the Department of Computing Sciences in the College of Science and Technology and include courses in computer forensics, information assurance, and network and cyber security. The courses in the environmental science track include oil

spill management, environmental assessment, hazardous materials management, and hazardous waste treatment technologies and are taught by faculty in the College of Science and Technology and the National Spill Control School.

Third, the program seeks to be responsive to the expressed needs of homeland security and emergency management organizations for highly educated leaders and professionals, and to the local community seeking information and knowledge on disaster mitigation, prevention, preparedness and resilience. The first item is achieved by having on-going evaluation of our courses and program by students enrolled in the program and by practitioners from our advisory board. The advisory board, consisting of homeland security and emergency management professionals in our region, was established to provide expert advice and counsel on matters of curriculum, program policies, and internship and job opportunities for students. The latter is accomplished by having students and faculty engaged in service learning and applied research projects in emergency management or homeland security within our community.

In designing and developing new graduate level programs in homeland security and emergency management, program directors must consider what teaching methods would be most effective in meeting program goals and learning objectives. At TAMUCC, the core classes in the Graduate Certificate have been taught in a classroom environment as well as via distance education. While most of our students prefer hybrid courses that integrate the use of online learning tools with the classroom activities, TAMUCC administrators are heavily encouraging that all of the courses be taught online as a means of increasing student enrollments. To date, our program has seen a modest increase in enrollments with the use of more online classes, particularly among students that are working full time. However, there is no evidence to date that indicates that one learning environment than another is more effective in meeting our program student learning outcomes.

To date, the Graduate Certificate Program at TAMUCC has resulted in a new additional specialty track within the MPA program that has been well received by graduate students and local emergency managers. Since the program's inception 12 months ago, the program has graduated eight students from the MPA program with this specialization. Given that students our MPA program has about 45 students currently enrolled, approximately one third are enrolled in this track. Of those eight that have graduated with a MPA degree with a homeland security specialization, two have been employed by the Department of Homeland Security, one with a nonprofit working with immigrant children and families, one with a city emergency management office, and four with state and local government agencies. In addition, those four students that obtained jobs in emergency management or homeland security positions upon graduation had completed applied research or service learning capstone projects in these fields in partnership with local emergency managers and first responders. As a result, these students gained valuable practical experience and an extensive network of professional



contacts. These projects were not only invaluable learning opportunities for students, but also useful research projects that greatly benefited local and regional disaster planning efforts.

Despite the efforts of MPA faculty and students, this program has not shown substantive growth due to significant budget cuts to public higher education over the past two years in the state of Texas. Despite support for the program by administrators, there are simply limited funds to support this fledgling program. For a new program to be successful, it is critical that there are funds for marketing the new program and for recruiting new students. These spending cuts and constraints have resulted in minimum funds (about 2 weeks of additional faculty salary) to pay for additional faculty time, to develop marketing materials, or to purchase library materials. In addition, while faculty are not openly discouraged by colleagues and administrators from designing and teaching interdisciplinary courses, there are few that want to engage in such collaborative activity due to the lack of time and resources provided to faculty. Faculty members are often not provided course releases to design or develop courses in a team environment, are not provided additional training or education on how to successfully teach interdisciplinary courses, and are not rewarded for the creativity or innovations in teaching this demands in their promotion and tenure reviews. Given these disincentives, it is easy to understand why program directors would choose to implement multidisciplinary emergency management and homeland security programs despite the significant benefits of effective interdisciplinary teaching and learning.

## CONCLUSION

There is no doubt that interdisciplinarity has proven to be a useful tool in confronting issues of national and international significance, which usually require the expertise of individuals from a myriad of disciplines. It is this reality that makes it urgent to consider how to build interdisciplinary experiences for students in EM and HS programs that they can refer to later when they assume responsibility for solving problems beyond their discipline as it is now defined. Faculty members need to prepare students not only to compete for jobs in a global economy, but also to have the intellectual breadth of knowledge to understand complex issues, become creative knowledge-seekers, and have the ability to navigate and synthesize knowledge in our current information-saturated culture. Before we can move forward in preparing interdisciplinary courses or programs we must consider a number of questions. First, how do we integrate interdisciplinary courses into our curriculum? This question deals with how an interdisciplinary course will be structured and delivered and includes questions on which faculty would be part of the interdisciplinary team, what the subject of the course would be, how it will be conceptualized, how the content should be ordered, how deeply a topic should be explored, and how the course will be assessed. Second, how can faculty be prepared for interdisciplinary teaching? That is, what types of staff development activities need to be implemented to

prepare faculty to work in teams, and to develop integrated course materials and program curriculum. Third, what are the barriers in general in higher education, at the university and department level to faculty in developing and implementing interdisciplinary courses and how can these barriers be overcome? Fourth, should specialized programs in emergency management and homeland security be integrated into their own distinct curriculum or are they better suited for other academic disciplines? If they should be integrated, should multidisciplinary or interdisciplinary approaches be utilized?

The limitations of the disciplinary approach to knowledge production and dissemination that characterize American higher education are increasingly recognized. Participation in the knowledge-based economy, meeting complex social and environment demands, solving complex problems, and preparing students for a life time of future learning all require the university to evaluate those practices that have long defined the institution. Although disciplinary boundaries have facilitated a depth of knowledge and advancement in particular fields, they have also isolated faculty, students and practitioners from collaborative dialogue and engagement. This paper has highlighted the benefits and challenges of interdisciplinary teaching and learning. Obvious obstacles to facilitating interdisciplinary work are the structural barriers of the disciplines: locating scholars in silos across campus, and influencing perspectives related to academic behavior. These structural barriers are compounded by the cultural and cognitive perspectives, which further privilege disciplinary ways of thinking. To support disciplinary work, universities must change their core functions of teaching, research and service. Only through these changes can the value and potential of the interdisciplinary process proposed in this paper be realized in an integrated homeland security and emergency management program.

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