A QUALITATIVE INQUIRY OF STAKEHOLDER RECOMMENDATIONS FOR COLLEGIATE AVIATION SECURITY CURRICULA

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A QUALITATIVE INQUIRY OF STAKEHOLDER

RECOMMENDATIONS FOR COLLEGIATE

AVIATION SECURITY CURRICULA

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CHAPTER I

INTRODUCTION

The attacks of September 11, 2001, graphically demonstrated the power of asymmetrical warfare, changed the worldwide environment, and ushered in an era where security is paramount. In this environment, aviation security and education took center stage in the battle for protection of the United States and its citizens.

No longer does an enemy need massive military forces at its disposal to have a devastating effect on a country or its national interests. The economic, human, and psychological shock of the September 11 attacks on the nation was unprecedented. Even the surprise Japanese attack on Pearl Harbor could not compare with this blatant attack on innocent civilians.

The immediate destruction wrought by the attacks amounted to over $40 billion in property loss and more than 3,000 lives (Schneier, 2003). That was only the beginning. The collective shock of the September 11 attacks was widespread and multifaceted. The very psyche of the American people was shaken to the core. America was no longer invulnerable; and terrorism was no longer just a scene of smoking rubble on a television screen depicting some far away incident. Passive attempts at security were no longer sufficient.

Government, the aviation industry, and those in charge of our safety and security must be accountable. The words aviation and security have now been welded together.

Using aviation as a weapon of mass destruction, the terrorists proved to be innovative and highly effective in their attacks. Both the aviation and security industries were caught completely off guard. It is these two industries that have drawn the attention of the American people and to whom the nation now turns for answers. The attacks vividly illustrated several key points that affect the aerospace industry as a whole:

1. America, in general, and the aviation industry in particular, are vulnerable to attack.

2. The economic impact of the failure of the aviation industry would have devastating effects on the overall economy.

3. The security industry failed to secure commercial aviation.

4. Government agencies failed to coordinate efforts and share information effectively enough to detect and prevent the attacks.

5. The aviation industry is critical to the national security of the United States.

6. America's colleges and universities have an important role to play in securing the nation's airways.

The importance of providing the maximum protection for the aviation industry and the citizens of the United States cannot be over emphasized. If that goal is to be attained, a new generation of highly trained and educated professionals must be developed.

America has always turned to its universities to furnish the best and brightest individuals available to meet the challenges of freedom. The mission of the Department of Homeland Security University Program is to "Stimulate, coordinate, leverage, and utilize intellectual capital in the academic community to address current and future homeland security challenges, and educate and inspire the next generation homeland

security work force" (Department of Homeland Security, 2005). However, an online search of major universities in all 50 states revealed only one degree program in Aviation Security. This qualitative study was designed to address that gap by eliciting recommended aviation security curricula based on input from stakeholders active in the fields of aviation, security, and academia.

Statement of the Problem

What aviation security curricula are required to meet the demands of today and the challenges of the future? The current world environment demands an efficient and effective aviation security system to insure the safety of the public and protect national interests. Little research has been done to determine what course work is needed within the various components of the aviation industry to meet these demands. It would appear the number of undergraduate and graduate programs in this field is insufficient to meet the aviation security demands created by the current environment. Very little data exists upon which to construct meaningful aviation security curricula.

Three distinct disciplines are essential to the development of a meaningful educational program in aviation security: security, aviation, and education. The general field of security provides the broad foundational level. Personnel in that discipline have developed techniques and protocols that are adaptable and useful in a myriad of situations. Aviation stakeholders possess the expertise and information needed to customize security to meet the unique demands of the aviation industry. Finally, advice from those in the world of academia with years of experience in developing educational curricula provides the final element needed to develop well-rounded curricula recommendations. These

stakeholder recommendations offer a rich source of data regarding industry security needs, and should become the driving force for curricula development.

Purpose of the Study

The purpose of this study was to develop a set of stakeholder driven recommendations for aviation security certification and degree programs. The security industry, aviation industry, and academia all view problems in a different light. This study investigated stakeholder perspectives concerning aviation security and educational needs of the field, analyzed the data furnished, and drew conclusions based on that analysis. Those conclusions could be used to develop programs which will provide a basis for further research, impart needed knowledge to the students, and provide the aviation industry with a pool of intellectual capital capable of meeting the challenge of aviation security in our rapidly changing world..

Research Questions

The following broad research questions were answered by this study.

1. From a multi-discipline approach, what skill sets do stakeholders consider essential to enhancing aviation security?

2. From a multi-discipline approach, what core knowledge bases are essential for students entering the aviation security field?

3. What specific course work should be incorporated into collegiate aviation security programs to provide students with the knowledge and skills needed to meet current and future aviation security challenges?

Assumptions

Recent worldwide events necessitated inclusion of several assumptions, which were the basis for this research. First, there was the assumption that aviation security is vital to the national interest and personal safety of citizens in the United States and around the world. There was also the assumption that the threats to aviation will be significant for the foreseeable future. The most important underlying assumption for this study was that by taking a holistic approach and obtaining input from leaders in the field, sound aviation security curricula could be developed. Those curricula would then enhance the capability of graduates resulting in a more effective aviation security environment.

Limitations

In keeping with the traditional design of qualitative research, the number of participants was small; therefore, care must be taken in generalizing results to the greater population. The participants were drawn from a limited number of professions, which constricted the overall viewpoint further. The nature of the study limited the amount of data that could be gathered, transcribed, and analyzed. However, the quality of participants and their expertise provided a rich source of data to aid in overcoming the listed limitations and thereby allowed a meaningful study to emerge.

A primary limitation was the necessity to conduct several of the interviews by phone which eliminated the ability to observe many physical behaviors that could influence the tone and texture of the interview. However, due to the experience level of the interviewer, who over the past 35 years has conducted hundreds of interviews, with close attention to verbal cues, such as speech patterns, voice inflection, and pauses, the loss of data through behavior interpretation was minimal.

Definitions

Conceptual Definitions

Air Marshals – Federal Officers employed by the Transportation Security Administration to provide onboard security for both domestic and international flights.

DHS – Department of Homeland Security

EDS – Explosive Detection Devices

LEO - Law Enforcement Officer

TSA - Transportation Security Administration

Operational Definitions

Aerospace – The industry as a whole including any industry or government organization which supports the manufacture, maintenance, repair, or operation of vehicles used in the space comprising the earth's atmosphere and beyond.

Aerospace Security – Refers to the protection of assets belonging to any industry or government organization which support the manufacture, maintenance, repair, or operation of vehicles used in the space comprising the earth's atmosphere and beyond.

Assets – Refers to anything of value

Aviation – Commercial, military, and general aviation, a subset of aerospace related to operation and direct operational support for vehicles capable of atmospheric flight.

Aviation Security – The measures and systems designed to reduce the dangers of terrorism, criminal activity, and irrational acts to those involved in the aviation industry.

Disruptive Passenger – A person, who by disruptive behavior due to alcohol, mental condition, or objectives other than criminal or terrorist-based, causes a threat to an aircraft aviation asset.

Intelligence – Raw data or information that can be transformable into actionable knowledge.

Profiling – The act of using a prescribed set of standards to select individuals for special attention or additional screening.

Risk – The likelihood of a threat being carried out and the seriousness of a successful attack.

Risk Management – The process of measuring or assessing risk and then developing strategies to manage that risk.

Screening – The act of separating people and property according to prescribed standards.

Security – The quality of being secure or free from danger. The state that exists when assets are protected.

Stakeholder – For the purposes of this study a stakeholder is a person with a vested interest in the security of aviation assets.

Terrorism – The systematic use of violence to create a general climate of fear in a population and thereby bring about a particular political objective.

Threat – The means used to attack a system.

Scope of the Study

The aerospace industry is a complex layered system, including military, commercial, general aviation, manufacturing, maintenance repair and overhaul, and a variety of government aviation and space services for atmospheric and above atmospheric flight. Each of these industry segments illustrate the complexity of providing security to an industry that has unlimited potential for misuse and abuse as well as terrorist activity.

Although the entire aerospace industry is considered vulnerable, the scope of this study was restricted to the aviation industry which was the segment of the aerospace industry most directly affected by the September 11 attacks. It is recognized that lessons learned from aviation security stakeholders of the past can benefit the entire aerospace industry and the findings of this study should prove valuable to development of educational requirements for all segments of the industry.

The aviation industry consists of the commercial industry which involves primarily cargo and passenger flights. The airline industry is a part of the commercial aviation industry which also includes a wide range of other services involving regional and charter services. General aviation includes thousands of small public and privately owned airfields and thousands of small aircraft. Specialty services such as agricultural aviation and air ambulance services all fall under the aviation industry, each with its own unique set of security challenges. The responsibility for securing the industry is shared by a wide range of public and private entities at all levels.

We are now acutely aware of the need for security; unfortunately, the demand for people who are trained in security now far outweighs the supply. The need to secure airports, aircraft, and maintenance facilities, coupled with the screening of passengers, airlines employees, vendors, maintenance workers, and others is just the tip of the iceberg. In-depth planning, followed by sensible implementation of flexible and resilient security measures, is essential to insure the safety of the flying public and the future not only of the aviation industry but the entire aerospace industry. The advent of technology will not meet the rising demands for security. It will require security personnel who understand

the problems, have the knowledge to apply the appropriate solutions to security issues, and use technology to the maximum benefit in the right place at the right time.

The data developed by this study can be used to provide the information needed to make sound curricula decisions. These decisions could result in the implementation of aviation security degree programs that would meet the needs of students, the university, and the industry. If the suggested curriculum is adopted, the individuals exposed to it can make a difference in the safety of the flying public and the nation as a whole.

CHAPTER II

REVIEW OF THE LITERATURE

Introduction

Recent world events illuminated the deficiencies in security of the aviation industry; those deficiencies, in turn, highlighted the need for improved support from the academic community. Academia must take the lead in identifying and assessing the educational requirements of those responsible for protection of the industry and the nation and its citizens. Current research which defines the content of meaningful security curricula in the field of aviation is somewhat limited. With this in mind, the primary focus of the literature review in this qualitative research is to convince the reader that a problem is important and that "it is not understood sufficiently well" (Sutter, 2006, p. 409). Further, according to Marshall and Rossman (1995), previous literature may be inadequate for constructing background for qualitative research (p. 31). Since qualitative research is exploratory in nature, and previous research on collegiate aviation security curricula is minimal, the researcher in this study seeks to listen to the perspectives of selected participants in order to build an understanding based on their ideas. This study is a grounded theory, qualitative study conducted from a positivist epistemological standpoint, based on the fundamental belief that effective curricula for aviation security exists, and through effective research can be discovered. According to Creswell (1994), in qualitative research which is based on grounded theory, the literature review will be less used to set the stage for the study (p. 21).

In order to address the growing security needs of the industry, academic research is imperative not only to identify and develop technical requirements but to identify and develop educational requirements for the industry's human resources. A starting point for that research would be to tap existing stakeholder knowledge and develop a set of stakeholder driven recommendations for future aviation security certification and degree programs. In doing so, a review of the literature must encompass:

1. The establishment of shared meaning related to development and application of current aviation security terminology.
2. A review of current iconic literature related to threats to the aviation domain through terrorism, other criminal actions, disruptive passengers, and acts of hostile nation states.
3. An analysis of current aviation knowledge requirements and best practices for addressing those threats through risk management, intelligence and other decision-making practices of aviation security personnel engaged in the performance of their duties.
4. Analysis of existing academic curricula available in aviation security degree programs and options.
5. Review of issues and guidelines related to educational needs assessment and development of quality curricula based on stakeholder recommendations.

Development of Aviation Security Terminology

An old Chinese proverb states that the beginning of knowledge is to call things by their right names. A review of the literature concerning *aviation security* must begin with the development of common aviation and aerospace security terminology. An

examination of how that terminology is used in the aviation security literature will contribute to that understanding.

Aviation has been defined narrowly as the operation of heavier than air aircraft and can be extended to include manufacture, development, and design of those aircraft (Aviation, 2006). For the purposes of this study, the more narrow definition of aviation has been used.

When considering aviation security an overall understanding of the industry is essential. Developing, building, and flying airplanes are but a small portion of the overall aerospace domain. Aerospace includes maintenance, repair, overhaul, space operations, technology and many other facets of a complex industry.

The National Strategy for Aviation Security refers to "air domain" and defines it as "the global airspace, including domestic, international, and foreign airspace, as well as all manned and unmanned aircraft operating, and people and cargo present in that airspace, and all aviation-related infrastructures" (Department of Transportation, 2007, p. 2). This definition provides a more accurate understanding of the full scope that aviation security is expected to address.

The Merriam-Webster on-line dictionary defines *security* as, the quality of being secure, free from danger or anxiety. However, Schneier (2003) provides a more succinct definition: "Security is about preventing adverse consequences from the intentional and unwarranted actions of others" (p. 11). It is the element of prevention that allows a state of security to exist.

Aviation security is about preventing losses to the aviation industry. The loss of property, the loss of life, and even the loss of psychological well being all have a

dramatic effect on aviation. The National Strategy for Aviation Security states, "The United States has a vital national interest in protecting its people, infrastructure, and other interests from threats in the Air Domain" (Department of Transportation, 2007, p. 5). Protecting the safety of citizens and the infrastructure demands a proactive approach. Prevention demands a realistic risk management approach that allows proactive measures to be implemented before events occur.

Science fiction movies for decades have introduced force fields as a means of protection. These futuristic shields have protected individuals, space ships, and entire worlds. Unfortunately, aviation security of today has no such magical shield. However, the concept is valid. In order to protect the air domain, a protective shield of training, education, technology, and intelligence, must be woven into a dynamic flexible security system. The system must be based on sound risk analysis and designed to resist threats and cover vulnerabilities.

This study was designed to develop meaningful curricula recommendations based on stakeholder perspectives to aid in the mitigation of risk to aviation assets. Toward that end, this review examines the existing knowledge related to threats to the aviation industry. It explores current aviation knowledge requirements related to addressing those threats through risk management and other decision-making curricula. In addition, it examines existing issues and guidelines for identifying gaps and developing new curricula. What have we already learned about threats to the aviation domain?

Threats to the Aviation Domain

A report by the European subsidiary of the Rand Foundation dated September 23, 2005, lists 805 incidents resulting in 2,085 terrorist related civil aviation deaths between

1968 and 2005 (The Transportation, 2005). While civil aviation is not targeted as often as other entities, it has the highest number of fatalities per incident of all terrorist activities.

According to Kuepper (2004), the aviation sector employs over 127 million people world wide, accounts for revenues of $3.5 trillion, carries 1.5 billion passengers and moves 28 million tons of cargo annually. An industry of that magnitude provides a very large and lucrative target. Only through research and development of the intellectual capital engaged in prevention of these attacks can society hope to minimize and someday eradicate the use of its aviation system for violence and destruction.

Attacks on aviation assets are not new; they have been a part of the industry from the very beginning. Crouch (1989), in his work on the lives of Orville and Wilbur Wright, pointed out that the fear of patent infringements slowed their progress and nearly cost them their fortune.

While this example is not the common threat that comes to mind when aviation security is mentioned, it was none the less a perceived threat perpetrated against an asset that could have resulted in a loss if not mitigated. However, as in this case, failure to properly assess a threat can result in security measures that not only fail to mitigate the risk but actually cause unexpected negative consequences.

Thomas (2003) pointed out that, historically, threats to the aviation sector have come from three classes of people: terrorists, criminals, and disruptive passengers, each with their own agenda. Events of the last decade warrant the addition of hostile nation states as an additional threat category. Over time, the methods and motivations of each grouping shifts and requires constant upgrading of laws, regulations, and security

procedures, as well as the educational system that provides the underpinnings of support for the procedures.

Terrorists

The word terrorism comes from the Latin *terrere*, which literally means to cause to tremble (Terror, 2006). With or without a name, terrorist acts and tactics have been a part of human history for centuries. An understanding of the terminology, history, and phases of terrorism is imperative to development of new knowledge that can be used in education for prevention and improved response to future terrorist threats.

The history of air terrorism began in 1931 when a Pan American Airways Fokker was hijacked by Peruvian revolutionaries (U.S. Centennial of Flight Commission, 2003) . That desperate act was the first in a long and incomplete series of what has become known as terrorist acts. There is no universal definition for the term *terrorist.* Dozens of definitions exist, all reflecting the viewpoint of the person or entity creating them. The following are some of the more commonly used.

Table 1.

Official Definitions of Terrorism

State Department definition, Title 2 of the U.S. Code, Chapter 38, Section 2656f(d): "premeditated, politically motivated violence perpetrated against noncombatant targets by sub national groups or clandestine agents, usually intended to influence an audience."
Federal Bureau of Investigation definition: "the unlawful use of force or violence against persons or property to intimidate or coerce a government, the civilian

population, or any segment thereof, in the furtherance of political or social objectives."

Defense Department definition: " the calculated use, or threatened use, of force or violence against individuals or property to coerce or intimidate governments or societies, often to achieve political, religious or ideological objectives."

United Nations definition: "any act intended to cause death or serious bodily injury to a civilian, or to any other person not taking an active part in the hostilities in a situation of armed conflict, when the purpose of such act, by its nature or context, is to intimidate a population, or to compel a government or an international organization to do or to abstain from doing any act."

As illustrated above there are many differing opinions on the central focus of terrorism. Should the focus be on the act, the motivation, or some other aspect? There is some agreement, however, that any definition of terrorism should include at least three primary elements: method, target, and purpose (Kushner, 2003). The simplified definition listed earlier in this work meets the Kushner standard and was used for this study.

Since 1948, several distinct phases of terrorism have emerged, as outlined in Table 2 based on data from the Irish Aviation Authority report dated September, 2004 (Irish Aviation, 2004).

Table 2.

Phases of Aviation Terrorism During the Past 50 Years

Phase I	1948 to 1968	Flight from persecution or prosecution
Phase II	1968 to 1994	The political phase
Phase III	1994 to date	The aircraft as a weapon of mass destruction

Phase I – Phase I was characterized by individuals or small groups hijacking aircraft primarily as a means of escape either from oppressive governments or legal authorities. According to the United States State Department, the first United States aircraft was hijacked on May 1, 1961, by Antuilo Ramierex Ortiz, a Puerto Rican fleeing his home country and seeking asylum in Cuba (Office of the Historian, 2004). During this period, hijackings to Cuba and other sympathetic nations became common. Many such flights resulted in the crew and passengers arriving unharmed if they submitted to the hijacker's demands, a practice which proved fatal in Phase III.

Phase II – Although numerous incidents in Phase I involved the use of violence, the period from 1968 forward raised the bar on death and destruction. In Phase II, the primary motivation for terror in the air shifted from escape to political action. Bruce Hoffman (1998) pointed out that the anti-colonial terrorist campaigns such as the National Liberation Front (FLN), the Israeli Irgun, and the National Organization of Cypriot fighter (EOKA) of the late 1960s proved that terrorism did in fact work, and laid the foundation for future acts of politically motivated violence. The problem shifted not only in motivation but also geographically, from regional action to a more global format. Table 3 describes incidents typical of that era.

Table 3.

Sample Phase II Aviation Terror Events

Typical Phase II Aviation Terror Events			
Incident	*Date*	*Group*	*Result*
Entebbe	June 27, 1976	Badder-Meinof and Popular Front for the Liberation of Palestine (PFLP)	Israeli military rescues 258 passengers
Trans World Airline Flt 847 Hijacking	June 14, 1985	Lebanese Hezbollah	American sailor murdered crew and 145 passengers released after Israel released 435 Lebanese and Palestinian prisoners
Air India Bombing	June 23, 1985	Sikh and Kashmiri Terrorists	Air Canada Boeing 747 destroyed in flight killing 329
TWA Flight 840 bombing in Greece	Mar 30, 1986	Palestinian Splinter Group	4 United States citizens killed
Kimpo Airport Bombing	Sept 14, 1986	North Korean Agents	5 killed, 29 injured
Pan Am Flight 103	Dec 21, 1988	Believed to be Libyan Terrorists	All 259 onboard killed
Air France	Dec 24, 1994	An armed Islamic Group	All four terrorists killed during rescue

The list provided in Table 3 is by no means exhaustive, but does illustrate the type of attacks taking place during the period and the shift to a more global approach. As violent as these attacks were, the worst was yet to come.

Phase III – Phase III began with the hijacking of Air France Flight 8969 in December, 1994. The terrorists were denied landing rights in Paris after French Police received information that the terrorists intended to detonate the plane over the city. The aircraft was diverted to Marseilles where French police commandos successfully rescued the passengers and crew. This event marked a turning point. From that point forward, aircraft could be considered as weapons of mass destruction.

Terrorists quickly realized that the use of aircraft as weapons allowed not only for physical damage, but held enormous potential for psychological and economic damage as well. In 1995 Ramzi Yousef planned an operation he named "Bojinka," which would have resulted in the mid-air explosion of eleven United States carriers over the Pacific in one day (Juergensmeyer, 2000). In addition to the horrendous loss of life, such an attack would have resulted in immeasurable economic and psychological damage to the United States and the world.

The failure of Yousef's operation did not deter the Bin Laden organization. The September 11, 2001, attacks illustrated, with undeniable clarity, the vast potential for using aircraft as weapons of mass destruction. Thomas (2003) pointed out the multi-faceted effects of the September 11 attacks by discussing the psychological, economic, and human impacts.

The human impacts of the September 11 attacks are immeasurable. While most set the death toll at well over 3,000, the actual number of deaths and injuries may never be positively determined. On May 24, 2007, yet another death was added to the toll when the Chief Medical Examiner of New York City declared the death of a New York City Attorney, Felicia Dunn-Jones, a September 11 related death (CNN.com, 2007).

During the month of May, 2007, deaths in Afghanistan and Iraq surpassed the official number of those killed during the September 11 attacks. If the deaths and injuries added by resulting military actions are included, only history will be able to assess the total human impact. One thing is certain, those losses are horrific and contribute greatly to the psychological impact.

Numerous studies have been conducted to determine the psychological effect of the attacks. The results vary, but a study conducted by the Rand Foundation provided some indications as to the depth of the psychological wounds to the country. According to the study 90% of adults surveyed reported experiencing one or more symptoms of stress while 44% reported experiencing a substantial level of at least one symptom of stress (Rand Institute, 2002). Many facets of the psychological impact such as: post traumatic stress disorders, increased suicide rates among first responders, effects on children, and even the effects on mental health workers themselves are still being evaluated. The full psychological impact may not be known for years. Research in this area continues as society struggles to deal with all aspects of the human impact of terrorism, while at the same time developing the human intellectual capital necessary for prevention of such attacks.

Even in the quantitative world of the economy, exact figures and total impacts are illusive. An Office of Government Accountability report (Government Accounting Office, 2002) examined seven of the most comprehensive studies available on the economic impact of the September 11 attacks. These studies were conducted by: the New York City Office of the Comptroller, the New York Governor and State Division of the Budget, the New York City Partnership and Chamber of Commerce, the Fiscal Policy

Institute, the New York State Senate Finance Committee, the Milken Institute, and the New York State Assembly, Ways and Means Committee. The Government Accounting Office report concluded that due to different methodologies and approaches, a definitive figure based on common ground could not be established. However, the report stated that the most definitive figures on the Cost of the World Trade Center attacks came from the New York Partnership study and set the direct and indirect cost of that segment of the attacks at $83 billion dollars. This figure does not include the more than $500 million to repair the Pentagon.

Mid and long term economic impacts are equally difficult to isolate. According to the Center for Contemporary Conflict, the sectors of insurance, airlines, tourism, shipping, and defense were most dramatically impacted (Looney, 2002). The effects included loss of revenue due to reduced travel, increased cost of insurance, increased cost of air freight, and a vast increase in military spending. These costs, added to the vast increases in government spending for homeland security, equal a huge economic impact that could drive the need for aviation security for the foreseeable future.

The physical, psychological, and economic impacts are only a few examples of the many areas affected by terrorist actions. They exemplify the importance of research and education not only directly in aerospace security, but, indirectly in related fields where intellectual capital support is required in a variety of ways to combat this blight.

Criminals

Although terrorism is the highest profile criminal act affecting the aerospace industry, it is by no means the only criminal act impacting the aviation domain. Airport thefts, pilferage, smuggling, ticket scams, and other criminal activities all take their toll

on the industry. More serious criminal activities such as commandeering, bombings, attacks on airport facilities, attacks on off airport facilities and hijackings worldwide, must be considered in the design of aviation security systems.

Air carriers around the world carry billions of dollars with currency, precious metals, gem stones, and art every day. These lucrative items have long been the target of criminals. The famous 1978 Lufthansa robbery resulted in the loss of $5 million in cash and over $850,000 dollars in jewelry and set the stage for future thefts (Staff, 1979).

In February 2002, robbers held up a security van at Heathrow airport and escaped with $6.5 million in American currency (World Briefing, 2002). In September 2004, three Johannesburg police officers were shot by robbers attempting to steal gold and diamonds being loaded onto a KLM flight bound for Amsterdam (News 24.com, 2004). In December of 2005, robbers stole over $7.4 million in sealed containers just off a Lufthansa flight and bound for the U.S. Federal Reserve depository in Miami (Press Release, 2005). This lucrative criminal activity shows little sign of going away.

Risk deals not only with the severity of an event but also with the likelihood that an event will occur. In that regard, likelihood of the risk of criminal activity exceeds that of terrorism. There are far more criminal acts per day than terrorist events. Security personnel and systems must be equipped to recognize and deal with ordinary criminal activity as well as the more serious terrorist events.

Disruptive Passengers

Each day over 1.8 million people fly in the United States alone (Bayles, 2003). Based on sheer numbers alone, disruptive passengers must be considered a serious risk. A disruptive passenger may display a wide range of behavior from non-compliance with

safety instructions to verbal harassment or physical assault directed at staff, passengers, or the aircraft Such behavior can have an equally wide range of impacts from mild annoyance to catastrophic. However, given the number of people boarding commercial aircraft each day, and the possibility of a dire consequence, the issue of disruptive passengers remains significant.

According to Fairchild (1998), the following possible causes of disruptive behavior include: inadequate training for flight attendants, poor cabin environment, cramped seating, failure of the airlines to meet customer expectations, and excessive use of alcohol. Fairchild theorized that low oxygen levels may influence passenger behavior, but the impact of alcohol is an established fact. Travel Medicine Journal reported that 80% of disruptive passenger incidents on United Kingdom Airlines involve alcohol (Bor, 2003). Captain Stephen Luckey, the chairman of the National Security Committee of the Air Line Pilots Association (ALPA), pointed out that most airlines have a policy of unlimited alcohol in first and business class (Statement of Captain, 1998). However, a recent United Kingdom study indicated that alcohol served by the airline was a factor in only 90 of the 479 alcohol related disruptive passenger incidents in 2005 -2006 (Darby, 2007). Passengers drinking prior to boarding, and using their own alcohol, were consistently more likely to be involved in disruptive behavior. Regardless of the cause, disruptive passengers remain a very real threat to the safety of the flying public. Those involved in the field of aviation security must understand the risks, become familiar with the causes for disruptive behavior, and become active in determining ways to mitigate the risks posed by these phenomena.

Hostile Nation States

There is a difference between state terrorism, in which states perpetrate terrorist acts upon their own populations, and hostile nation states that support terrorist groups that export terrorism to perceived enemies. Juergensmeyer (2000) provided a long list of states that have used terror to subjugate their citizens: the Russian purges by Stalin, the El Salvadorian death squads, genocidal killings by the Khmer Rouge in Cambodia, ethnic cleansings in Bosnia and Kosovo, and the government encouraged violence between the Hutus and Tutsis in Central Africa, provide but a few historical examples. These acts resulted in the deaths of millions, but were usually restricted to the borders of their own countries. Hostile nation states seek not only to terrorize their own people to gain submission and retain power; they endeavor to shape world affairs through sponsoring groups who export terror to their enemies. The United States State Department listed Cuba, Iran, North Korea, and Syria as nation states currently maintaining ties to terrorists groups (United States State Department, 2006). Libya and Sudan have, in the past, supported terrorist groups; but are currently cooperating, at least overtly, with the war on terror. Many other smaller nations support terrorists or terrorist groups but do so on a more limited basis. These nation states provide many difficult to obtain services and resources to the groups they support.

Regardless of their size or motivation, nation states provide a wide array of valuable resources to terrorist groups. They provide funding, a recruiting base, and perhaps, most importantly, they provide sanctuary. Afghanistan provides an excellent example. For years, the Taliban provided a safe haven where Al-Qaeda could set up a base of operations, establish a financial base, acquire weapons, train recruits, plan, and

implement attacks. The result of allowing this nation state sponsorship of terrorism was seen in the bombed-out rubble of American embassies, the gaping hole in the side of the USS Cole, the massive collapse of the World Trade Center, and the smoldering rings of the Pentagon.

Those involved in the aviation industry must be aware of the world environment and become cognizant of the threats posed to the industry by both terrorist groups and the nations that support them. Institutions of higher education have vast resources that can contribute to a deeper understanding of terrorism and prepare aviation security professionals to meet the formidable challenges presented by hostile nation states.

Current Aviation Security Knowledge Requirements and Best Practices

In addition to identifying the threats to aerospace security from terrorists, criminals, disruptive passengers, and hostile nation states, aviation curricula must address risk management and other decision-making practices which are currently used in the industry to combat threats. Education which addresses these practices provides the student with the knowledge base required to cope with threats and represents a critical part of the curricula.

Risk Management

Risk Management is a process involving analysis, decision-making, implementation, and constant re-evaluation. The review of this topic requires a clear understanding of several terms which are subject to various interpretations. The operational definitions listed in Chapter I for *asset*, *risk*, *threat, security, and aviation* will be used for this study.

The field of risk management has most often been associated with finance,

insurance, and medicine. Unfortunately, risk management and security have rarely been linked even though they share a common goal of preventing an unwanted result. To the contrary, most security measures have been reactive in nature, being implemented as a direct result of some act or event.

Both Thomas (2003) and Schneier (2003) strongly advocated the use of a risk analysis process to drive the implementation of aviation security measures. Both recommended, at minimum, a five-step process that included answering the following questions:

1. What are you trying to protect?
2. What are the risks to those assets?
3. Does the security plan mitigate those risks?
4. What other risks does the security solution cause?
5. What are the costs and trade-offs of the security solution? (Thomas, p. 135; Schneier, p. 14)

Only by using such a system can finite resources be applied to maximum benefit. The process may seem simple, but the application quickly becomes complicated. All things being equal, risks would be assessed, plans developed, and implementation accomplished using a logical, if not a scientific approach. However, as Slovic (2004) pointed out, the public has a multidimensional concept of risk. Social and cultural determinants of perceived risk are strong influences which have an impact on public policy. A major segment of that policy deals with aviation security measures, and has a direct bearing on their development, funding, and implementation.

Slovic (2004) also pointed out that the perception of risk is subject to

amplification involving two major stages: the transfer of information about the risk or event and the response of society to that risk or event (p. 243). Figure 1, taken from Slovic, illustrates his concept of social amplification of risk.

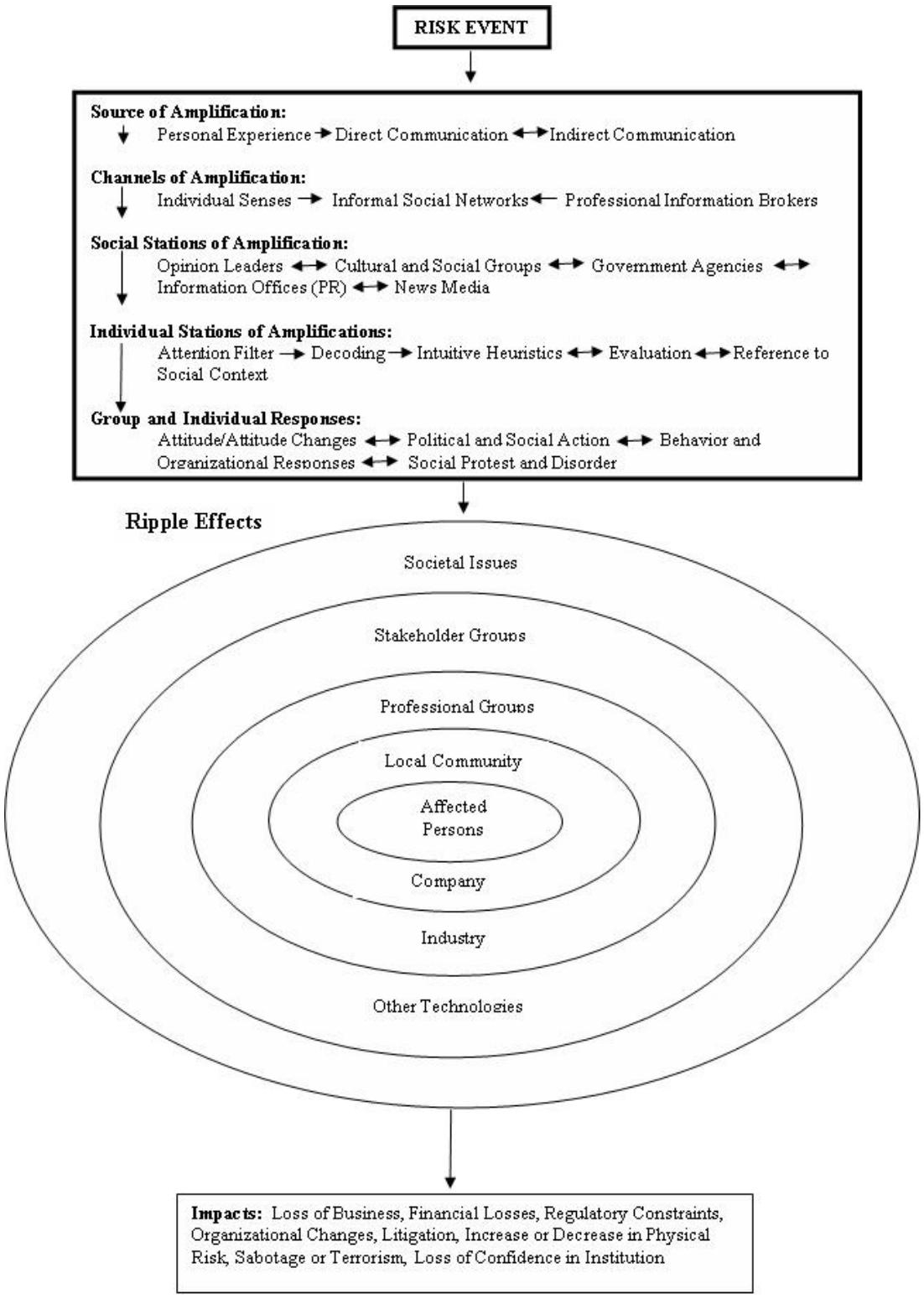

Figure 1. Detailed Conceptual Framework of Social Amplifications of Risk. Note: From *The Perception of Risk* (p. 240), by Paul Slovic, 2004, Towbridge, UK: Earthscan Publications Ltd. Copyright 2000 by Paul Slovic, 2004. Reprinted with permission.

Using the September 11 attacks as the risk event, then working through the Slovic concept provides a clear understanding of how social perception had a direct impact on the world in general, and aviation security, in particular. The concept has three main components: sources of amplification, ripple effects, and impacts.

The sources of amplification to the September 11 attacks ran the entire gamut. The direct and indirect communications of those involved were totally overshadowed by the massive news coverage of the event. The crash of the second aircraft into the World Trade Center was literally carried live and viewed by millions in real time. The footage of the crashes and the aftermath of those crashes were replayed over and over until they were indelibly ingrained on the psyche of the nation.

All three channels of amplification illustrated were completely open. Millions in the immediate area of the attack were able to experience the event with all their senses. The rest of the world could certainly see and hear the events through the efforts of the media and other professional information brokers. This massive media presence not only reported the events, but undoubtedly shaped and defined the issues in the days, weeks, and months that followed the attacks.

Pyszczynski, Solomon, and Greenburg (2003) noted that the effects of September 11 were enhanced by the two pronged psychological impact of witnessing mass murder and the ongoing fear of additional attacks. This threat to daily life could not fail to have a profound effect on individuals at all levels including those found in the social stations of amplification.

Social stations of amplification such as opinion leaders, governmental agencies, cultural groups, and the media, all played a major role in the aftermath of the attacks.

Leaders in both the public and private sectors were under enormous pressure to respond, and respond they did. Government leaders, agencies, and private industry all vigorously reacted; the skies were cleared; National Guard units were activated; and the aviation industry mobilized a vast lobbying effort.

Hundreds of actions, great and small, effective and ineffective, were immediately implemented. Individual stations of amplification such as: attention filters, decoding, intuitive heuristics, and the social context, all played a role in the evaluation and implementation of security measures.

Group and individual reaction to the tragedy have resulted in sweeping long term changes. The enactment of legislation, the reorganization of government, government financial support of the aviation industry, and the global war on terrorism are all direct results of pressure by social action and political groups.

Between September 11, 2001, and October 30, 2002, one web site lists over 130 Bills, Joint Resolutions, and legislative actions relating to the September 11 attacks (Legislation Related, 2002). The creation of the Transportation Security Administration and the Office of the Director of Intelligence represent the largest reorganization of government since World War II. The global war on terror is currently being fought around the world with major efforts underway in both Afghanistan and Iraq. All of these actions can be traced back to group and individual responses to the attacks of September 11, 2001.

The ripple effect portion of the Slovic (2004) concept is directly applicable to the September 11 attacks. However, with an event of this magnitude, an additional *global ring* should be added. These attacks not only affected the United States, but virtually

every country in the civilized world. The impacts are myriad and will not be fully known for years to come. The legislation, governmental reorganizations, and military efforts mentioned above, coupled with the global financial, business, and social impacts, certainly mark this event as a major milestone in the history of man.

In a post September 11 environment, risk analysis has taken on a whole new dimension. If sound decisions are to be made concerning the aviation security industry and finite resources are to be spent in the most effective manner, risk analysis and management must rise to a new and more effective level. Risk analysis based on sound threat assessment must become the central element of the decision making process. The field of aviation security must be populated with people who have the ability and skills needed to be fast and effective decision makers.

Decision Making and Intelligence

Traditional decision-making centers on specific problems that are often artificial in nature and have little application to fast moving, dynamic situations involving the threat (Flin, 1996). High-risk, high-threat environments demand a streamlined decision making process that result in acceptable solutions quickly.

Decision-making, in general, falls into two broad categories: strategic and tactical. The Directors of Homeland Security or The Transportation Security Administration and their staffs take a totally different approach to decision making than does a Federal Air Marshall faced with an armed terrorist in flight. The former uses a deliberate and methodical process to arrive at decisions affecting long term issues. The latter uses a quicker, more intuitive, right-brain decision resulting in a near instantaneous response.

Strategic decisions whether in business, government, the military, public or private sector always involve some type of systematic process. The US Army calls their process the Military Decision-Making Process. The process involves seven major steps with dozens of embedded sub-steps covering mission receipt, course of action development, analysis, comparison and approval (Wade, 2005). The process is thorough and leaves little to chance, but it is extremely time consuming and requires massive amounts of data.

Bazerman (2006) noted in his work on judgment in managerial decision-making that different researchers take slightly different approaches; but all take a rational approach using specific steps to frame problems and identify possible solutions. As with the Military Decision-Making Process these decision-making models require the decision maker to work through a regimented set of steps, in this case, posed as questions, to insure that all possibilities are considered. These processes, like their military counterparts, are effective and leave little to doubt. They also share the same shortcomings that are intolerable for the tactical decision maker.

The tactical decision maker is working without the benefit of time, full or accurate data, and under extreme pressure. This environment requires a completely different approach to decision-making; it requires an approach that is intuitive, quick, and effective. One such decision-making method is known as the "Boyd Cycle", named after Colonel John Boyd, a noted United States Air Force combat pilot (Tactical Decision, 2004).

Boyd determined, based on his vast combat experience, that the greatest asset to a fighter pilot was not speed or power, but the human mind. His method, also known as,

the OODA Loop, which stands for observe, orient, decide, and act, has proven a highly effective technique for combat commanders. The secret to its success is in its simplicity. The approach takes decision-making theory and puts it in tangible terms that can be easily understood and put into practice.

Boyd's rapid decision-making bears a striking resemblance to what Gladwell (2005) refers to as "thin slicing." For years experienced decision makers in various fields have relied on what they call "gut instinct."

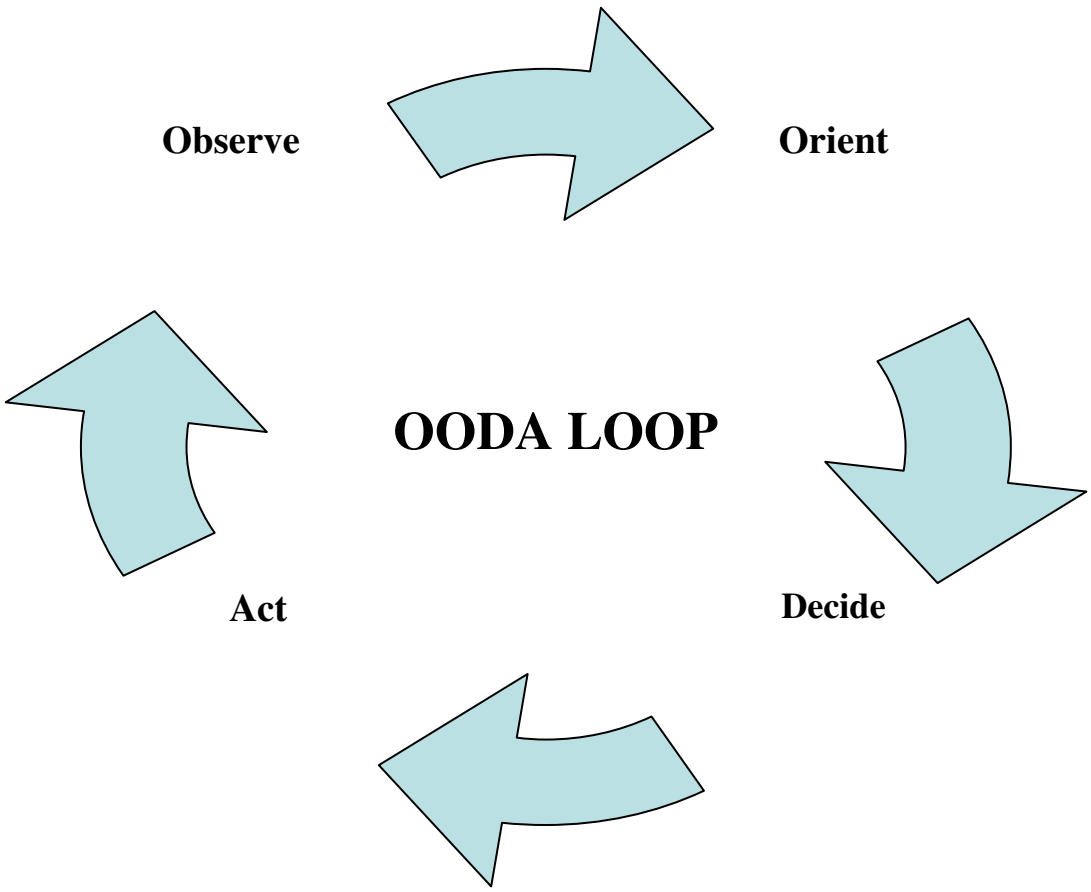

Figure 2. Observe, Orient, Decide and Act Loop

This gut instinct is actually the ability to quickly filter input through a person's experience, education, and training, and make a near instantaneous decision or assessment. Gladwell (2005) pointed out that, particularly in times of stress, our unconscious mind has the ability to make almost instantaneous decisions which can be every bit as good as those made after careful deliberation (p.14). According to Gladwell and Boyd, rapid decision making is an attainable skill; and although not infallible, when properly applied it can provide a powerful advantage over adversaries. Aviation security practitioners must be adept in both strategic and tactical decision making. To strengthen that portion of the aviation security force, field educational institutions will need to provide a dynamic approach to both tactical and strategic decision making education.

Threat Assessment and Risk Management are only two examples of a variety of curricula requirements necessary to support Aerospace Security efforts in the 21st Century. The field of Aerospace Security encompasses not only aviation security in general, but the broad based intellectual capital necessary for intelligence operations; communications; public administration; public relations; fiscal management; legal and legislative competencies; foreign relations; psychology; and sociological fields. Even building design and architecture for security of airports, manufacturers, Fixed Base Operators (FBO); Maintenance Repair and Overhaul (MRO) operations and others are included. Although not exhaustive, this list provides a glimpse of the scope of the industry and its requirements for educational support in multiple academic fields.

Existing Aviation Curriculum

In order to address current curricula needs in the field of Aviation Security it was important to review and assess degree programs and course work currently available. A

review of academic websites for aviation security course offerings was a daunting task. Aviation security coursework was frequently scattered in a wide variety of degree plans located in various colleges and departments within the universities examined. The focus of this search was to locate major universities or colleges that offer a complete degree in aviation security. While few pure aviation security related collegiate programs can be found, there are numerous courses, certificate, and degree programs in the related and dependant fields of security, risk management, and homeland defense. The National Academic Consortium for Homeland Security lists over 350 members, all of whom have some degree of interest in topics related to security in general. Some of the most notable programs can be found at Ohio State University, the Naval Postgraduate School in Monterey, California, Embry-Riddle Aeronautical University (Arizona Campus) and Harvard's John F. Kennedy School of Government.

The education, training, and outreach programs sponsored by Ohio State University provide information on a wide range of homeland security and terrorism related topics. In addition, the university offers coursework in Transportation Security, Introduction to Intelligence, Terror and Terrorism, and Information Analysis and Comprehension. While these courses are not directly applicable to aviation security, all contain information that can be applied to a wide range of security issues. Information gained through these courses would, undoubtedly, be valuable to those seeking careers in the field of aviation security.

One of the most dynamic intelligence and homeland security collegiate programs in the country can be found at the Naval Postgraduate School in Monterey, California. Their department of National Security Affairs provides extensive course work in the

areas of international relations, regional studies, military history, and security policy. Insight gained from such courses would be of great value to aviation security personnel. The Naval Postgraduate School offers three excellent advanced degrees; a Master of Arts Degree in Regional Security Studies, a Master of Arts Degree in International Studies, and a Doctor of Philosophy Degree in Security Studies. Again, while these degrees are not specific to aviation security, most would agree that knowledge gained in any of those programs would be highly valued by aviation security personnel.

Even Embry-Riddle Aeronautical University has no degree program specific to aviation security. It does, however, offer a Bachelor of Science degree in Global Security and Intelligence Studies. This program deals with topics such as terrorism, asymmetrical warfare, transportation security, pandemics, homeland security and several courses on various threats. This program contains many key elements needed in an aviation security degree program, and is the closest program found to an actual degree in aviation security.

Aviation security is directly affected by public policy and few universities can compare with the Harvard University John F. Kennedy School of Government when it comes to education in public policy matters. The School of Government offers several master and doctoral programs in health, public, and social policy. All of these programs contain elements on decision making and risk analysis which are critical skills and knowledge bases for aviation security personnel. In addition, it is extremely helpful if the personnel being asked to implement policies understand their origins. Such an understanding allows, or at least provides an opportunity, for buy-in critical to effective program implementation.

A search of over 100 major universities from every state in the union, listed in

Appendix F, revealed only one Bachelor Degree in Aviation Security. That program was offered by the Lewis University and consisted of 128 total hours and 76 major credit hours. Many universities provided coursework in the area but only one accredited university was found offering a degree program.

Issues Related to Development of Aviation Security Curricula

The aerospace industry is one of the largest industries in the state of Oklahoma. It employs over 100,000 and accounts for over 10% of Oklahoma's industry output with and economic impact exceeding $2.7 billon annually. (Oklahoma Aerospace Industry Workforce, 2007)). As the leading employer, the Oklahoma aerospace industry requires professional personnel educated in a variety of specialties including engineering, management, logistics, safety, and security. An industry of this size must be supported by an educational system designed to protect its fiscal and capital assets as well as its operations within and outside the state.

Aviation Security must be an integral part of the educational system from development of frontline security personnel to intellectual capital required to protect the industry from terrorist, criminal, and other threats. Without comprehensive security, the industry would not survive; and without education and development of its intellectual capital, security will not be effective in the state's largest industry.

Aviation Security Curriculum Planning and Design

Although this study was not meant to include a comprehensive plan for every step of the curriculum design process and the review of the literature related to adult education is not comprehensive, it is important to examine some of the applicable principles of quality educational curriculum planning and development. These principles applied to

the data provided by the interviewees enrich the study with years of practical experience and educational expertise and lay the foundation for meaningful curricula design. Triangulation of findings from multiple participants linked with existing literature could aid in validation of the study.

Cyrs (1994) described the use of the concept system as allowing us to look at the forest as well as the individual trees when we observe something. It looks at the purpose of the "thing" under study, all of the parts, and the relationships among its parts. Cyrs and Lowenthal (1970) extended the concept to a procedure from which curriculum could be developed from the perspective of a relational, problem-solving method of analyzing the educational process and making it more effective. The system is viewed as the whole process, including incorporation of all of its parts and aspects: for example, students, teachers, curriculum content, instructional materials, instructional strategy, the physical environment, and the evaluation of instructional objectives. Both approaches gain strength when stakeholder input is added to the process.

Thinking of education as a system provides valuable insight into the entire process necessary to insure quality education for the aviation security community. Beginning with stakeholder and learner identified needs, the process maintains its focus on the *big picture* through each step of the curriculum planning and development process and, ultimately, produces quality curriculum with instructional strategies designed to maximize learning. This study focused primarily on the needs and content of the curriculum, or the WHAT a student should learn as identified by its stakeholders, which is step one of the systems process. The purpose of this study was to glean valuable information regarding what a student of Aviation Security should learn from a rich source

of data (i.e., the stakeholders of aviation security) with an ultimate outcome of quality curriculum planning and development.

That goal did not preclude the possibility of a number of extraneous outcomes including valuable input from stakeholders regarding other steps in the process ranging from the MEANS available to the student for mastering the objectives, to HOW the students should be taught, and even the performance expectations on WHEN the student has mastered the learning objectives. Because qualitative interviews often evolve to include other topics, comments of interviewees outside the scope of the identification of curriculum, possibly into teaching strategies could also provide valuable information for curriculum planning and development.

Teaching Strategies – According to Lindeman (1926, p. 9) "…the resource of highest value in adult education is the learner's experience." That theory was further explored in 1978 by Malcolm Knowles and the four assumptions of his *andragogical* theory, based on adult maturity: (a) changes in self-concept from dependency to self-direction, (b) individual maturity with an increasingly rich reservoir of experience with which to relate new learning, (c) an increased desire or readiness to learn, and (d) a problem-centered orientation to learning (Knowles, 1979). Aviation security students are likely to have varying degrees of life experience which could be valuable to other students in the class. Consequently, curriculum should be identified which would tap the life experience of those with pertinent expertise who could make valuable contributions to the class.

The conclusion might be drawn that curricula developed around lecture concepts alone would prove less effective with adult learners. Therefore, advanced coursework

should be directed at life applications using the most applicable learning techniques.

Subsequent research both negates and validates some of the premises of Knowles' theory and advocates a strong mix of both styles. Bligh (2000) conducted a number of experimental comparisons of lectures with other teaching methods where acquisition of information was the main criterion; lectures were as effective as other methods to teach facts, but not more effective. He found that lectures are ineffective compared with "other methods" to promote thought, teach values associated with subject matter, inspire interest in a subject, teach behavior skills or personal and social adjustment skills. He concludes, "Use lectures to teach information. Do not rely on them to promote thought, change attitudes, or develop behavioral skills if you can help it" (p. 306).

In planning curricula for aviation security education, as in education in general, it is important to use a variety of topics, teaching strategies and assessment activities to gauge the attention and retention of learners. Although not necessarily critical to the development of the degree plan, it becomes very important to coursework planning since aviation security relies heavily on the application of life skills. The opportunity to apply new knowledge and skills to real life situations must be built into the curriculum as part of a complete learning system.

Global Considerations

An additional element of curricula planning relevant to this study deals with designing programs that prepare students to function in a global environment. Rhinesmith (1996) points out that the need to take a global approach to training has shifted in the past ten years. He articulates four populations he considers targets for global training: expatriates, those assigned to work outside their own country; those

traveling internationally; headquarters personnel of global concerns; and people involved in the transfer of technology.

Future aviation security personnel fit not one, but all of those categories. Education to prepare students for global operations must include the establishment of base knowledge in a plethora of disciplines including world cultures, religion, economics, political systems, and customs. Knowledge of how other cultures believe, learn, and react will be essential to personnel working on the world stage.

CHAPTER III

DESIGN OF THE STUDY

Research Design

The purpose of this study was to develop a set of stakeholder driven recommendations for aviation security degree and certificate programs. The epistemology of this work was objective in nature based on the belief that a curriculum exists that can address the needs of the aviation community and the general public. The theoretical perspective was post positivist with the primary research methodology being discourse analysis. The method of data collection was personal interviews. See Figure 3.

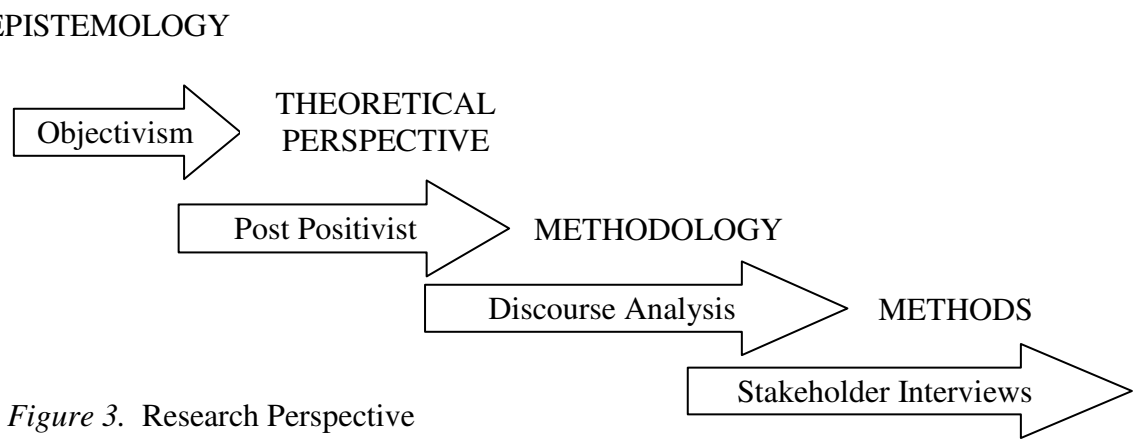

Figure 3. Research Perspective

This study was designed to investigate stakeholder perspectives concerning aviation security and educational needs, and to derive conclusions based on the findings. The interview questions were designed to illicit information concerning skills and base knowledge that stakeholders believed were essential for students completing aviation

security programs. Additional information was gathered concerning opinions on curriculum design and specific course work that would meet those objectives.

The increased use of technology alone will not meet the rising demands for security; it will require qualified personnel who understand the problems and have the knowledge to apply appropriate solutions to security issues. Only then, can technology be used to its maximum benefit.

The findings of the study have provided information that can be used to make sound curricula decisions, resulting in the implementation of aviation security programs that could meet the needs of students, the university, and the industry. If the suggested curricula is adopted, the individuals exposed to it could make a difference in the safety of the flying public and the nation as a whole.

Any examination of research usually begins with some discussion of the component parts. What makes good research? Wiersma (2000) stated that sound research is: empirical, systematic, valid, reliable, and capable of taking on a variety of forms. While many will place differing levels of importance on the various components of research nearly all count reliability and validity as essential elements. Lincoln and Guba (1985), Creswell (1998), Stenbacka (2001), and Patton (2001) raise the issue of reliability and validity early in their works.

Reliability deals with consistency and repeatability, while validity is concerned with content and the issue of whether or not the research actually answers the question it was designed to address. Of these two essential elements, validity takes the lead role in qualitative work.

It has even been argued that due to the nature of qualitative research, especially studies such as this which revolve around interviews of a purposefully selected sample, that reliability does not apply. Stenbacka (2001) goes so far as to state that since reliability concerns measurements, it has no relevance in qualitative research and should not be used to determine the quality of qualitative research. Lincoln and Guba (1985) address the issue of reliability in absentia by stating that: "Since there can be no validity without reliability, a demonstration of the validity is sufficient to establish reliability" (p. 316). While discussing the ability of researchers in qualitative studies, Patton (2001) reiterated that reliability is a consequence of validity in qualitative studies, and pointed out that in quantitative research, credibility depends on instrument construction, while in qualitative research, "the researcher is the instrument" (p. 14).

According to L.R. Gay (1996), the concepts of validity and reliability are relevant but viewed differently in qualitative data: "In qualitative [research], 'measurement' validity is the degree to which observations accurately reflect what was observed and interviewers accurately reflect the feelings, opinions, and so forth of those interviewed and consequently, permit appropriate interpretation of narrative data" (p. 225). The competence, experience and dedication of the person conducting the interviews are highly correlated with validity and reliability of the data.

Gay defines a number of methods for attaining qualitative validity: (a) triangulation or use of multiple methods, data sources, or data collection strategies; (b) consistency across observations over time; (c) consistency of interview data among persons interviewed as well as consistency of interview data for the same person(s); (d)

consistency of researcher data and impressions; (e) use of multiple methods (triangulation) of data collection strategies and data sources; (f) or use of recording data (p. 242). Mathison (1988) stated: "Triangulation has risen [*sic*] an important methodological issue in naturalistic and qualitative approaches to evaluation to control bias and establishing valid propositions because traditional scientific techniques are incompatible with the alternate epistemology" (p.13).

In this study, triangulation of data involving separate stakeholder groups (aviation, security, and academia) provide validity and, thereby, reliability. Rubin and Rubin (1995) also do not agree that validity and reliability indicators used in quantitative research fit with qualitative research. In their book, which focused on qualitative interviewing, they identify three indicators for use in judging the credibility of qualitative work: "*transparency, consistency-coherence, and communicability*" (p. 85).

Rubin and Rubin view t*ransparency* as the description of the basic processes of data collection which allow the reader to assess the interviewer's biases, conscientiousness, and strengths and weaknesses. They stress the importance of maintaining careful records of what the researcher did, saw, and felt, so that their research is transparent to others and themselves.

Consistency involves examining themes in one interview for coherence with themes in others, checking out inconsistencies or contradictions, and explaining why you accept one version over another, or, why under certain circumstances it was alright to hold contradictory understandings. *Coherence* involves asking for more detailed responses when necessary and explaining why contradictions occurred and what they mean. Credibility is achieved when it is apparent that the interviewer has checked out

inconsistencies and explored apparent contradictions. Coherence also involves demonstrating that core concepts and themes consistently occur in a variety of cases and settings.

Selection of the Sample

The selection of participants was crucial to the success or failure of this project. The quality of the information in an interview-based research project is directly linked to the expertise of the participants. In the study at hand, experts were selected based on their experience, educational background, and expertise within their disciplines. Several of the members were qualified in more than one area, for example, one participant had extensive experience as a military aviator but also held an EdD and had served as chair at a major university. Another holds a PhD, had held an extremely high position in the FBI, and served as the Vice President of security for a major world wide company. Table 4 illustrates the diversity of the study sample.

Table 4.

Participants by Discipline, Sector, and Location

	Discipline			
Participant #	Aviation	Security	Academia	Sector
1	X	X		Govt
2	X	X		Govt
3	X	X		Private
4			X	Educ
5			X	Educ
6		X	X	Private
7		X		Govt
8		X		Private
9	X	X		Govt
10	X			Private
11	X			Govt

Table 4. (continued)

Participants by Discipline, Sector, and Location

	Discipline			
Participant #	Aviation	Security	Academia	Sector
12		X		Govt
13	X			Private
14	X		X	Private

Methods

This study was a grounded theory, qualitative study conducted from a positivist epistemological standpoint, based on the fundamental belief that effective curricula for aviation security exists, and through effective research can be discovered. The methodologies and methods of any research project are driven by purpose of that research (Crotty, 1998). However, the selection of methods not only represents an effective means of arriving at the desired end, it reveals basic assumptions concerning reality and the nature of knowledge itself.

In keeping with the traditional design of qualitative research a minimal number of participants were used (Creswell, 1998). The research project employed one-on-one interviews of a purposive sample of participants. Those participants were selected for their potential to provide a rich source of data in their given fields. The qualitative approach and use of open-ended interview questions allowed for a robust examination of aviation security issues. Those interviewed were encouraged to share their perspectives on how an interdisciplinary approach to aviation security could be developed and utilized. The overall theoretical model for the study is illustrated in Figure 4. The grounded theory being that curricula developed based on stakeholder recommendations will result in the listed consequences.

A letter was sent to each participant requesting an appointment for interview, and providing an explanation of the research project, the time requirements, and questions to be asked. Permission was obtained for the use of digital recordings during the interview process. The participants were informed that their interviews were confidential and that their names would not be used in the study. Each participant was provided with an approved consent form and those forms were signed prior to the interviews being conducted.

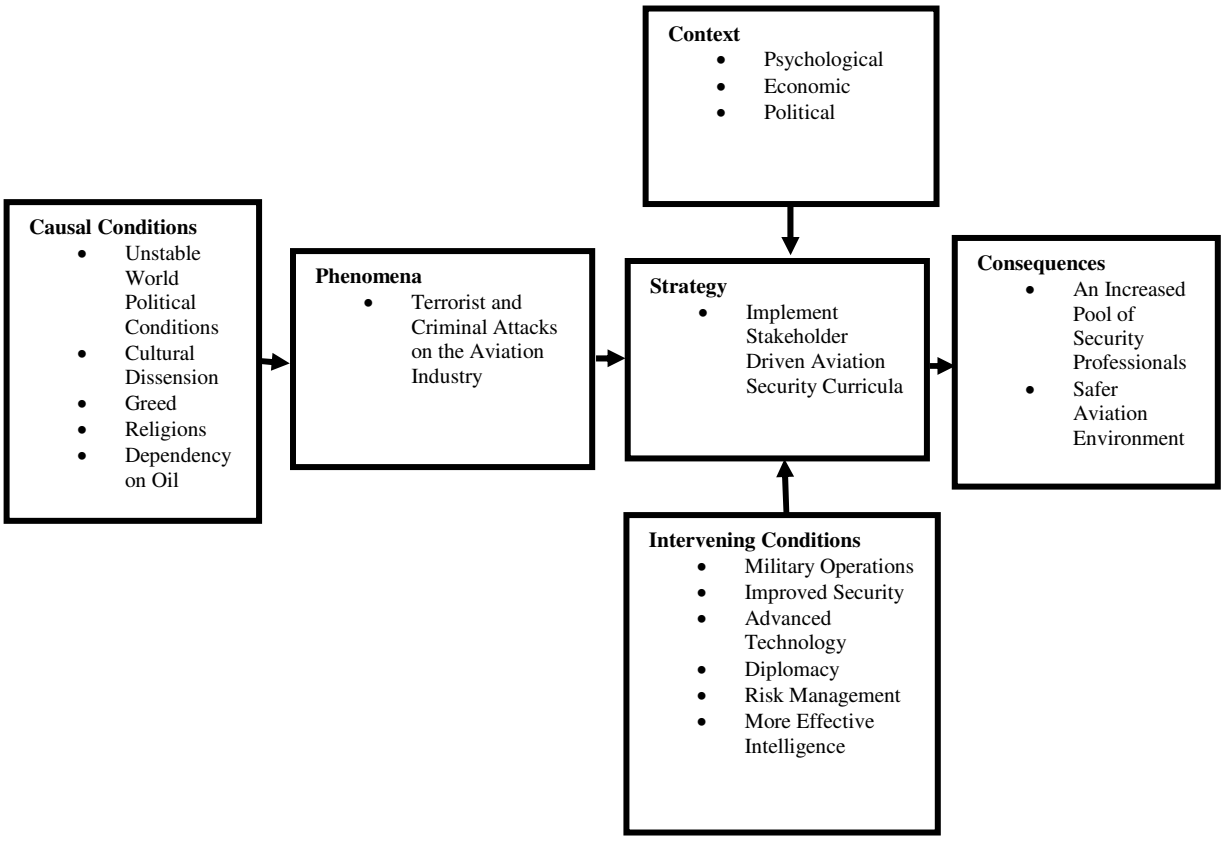

Figure 4. A Theoretical Model for Increasing Aviation Security

Prior to the actual study, three practice interviews were conducted to refine the questions, process, and interview techniques. Those interviews were completed with volunteers who had some base knowledge in their given fields but did not have the depth of knowledge needed for the actual study. Once the technique and procedure were refined, the actual interviews were scheduled.

During the study three interviews were conducted in a one-on-one setting using a digital recording, supplemented by field notes. Eleven interviews were recorded telephone interviews using the same questioning format. A literal transcription of the recordings was made upon the completion of each interview. The recordings and notes were destroyed as soon as the data was synthesized and analyzed. Individually identifiable comments were not included in the study.

Instrumentation

A long interview protocol was established utilizing five steps as suggested by Creswell (1998). The interviewees were identified, recording procedures were decided upon, the question guide was completed, an approved consent form was published and executed, and time constraints were met.

Three written instruments were used during the study. The first was an open-ended interview guide consisting of 16 questions provided in Appendix D. The second was the interview consent form approved for use in this study provided in Appendix B. Finally, a participatory letter provided in Appendix C was sent to each interviewee outlining the research project, thanking them for their participation, and providing contact numbers in the event questions should arise either pre or post interview.

Data Analysis

Analysis of the data was conducted with the assistance of Hyper-Research, a computerized software program designed for use in qualitative research. The process began with the transcription of the digital recordings of the interviews. The text transcriptions were then exported in the Hyper-Research program for coding. A master code list was developed and each interview was reviewed at length with the appropriate codes being linked to passages in the transcriptions. When all interviews were transcribed and coded, reports were generated that extracted specific data from the files. Recommendations as to specific knowledge bases, skill sets, and recommended course work, and additional contributions were then generated. Those reports were then compared to triangulate information and find common ground. Those areas with maximum triangulation or inter-discipline agreement were given the highest consideration.

The final step in the analysis process was "interpretation." To accurately interpret the findings, particular attention was paid to the connections between disciplines, common themes between participants, and linkages that would indicate curriculum needs. The first step was to look for common denominators in the data, those things upon which all or the majority of the participants agreed were of particular interest. Next, linkages between disciplines were examined to determine cross interests that required special attention.

CHAPTER IV

FINDINGS

The findings for this study were gleaned from over 200 pages of transcribed interviews from 14 aviation security stakeholders ranging from field representatives to executives. The study was designed to identify learning needs and develop a set of stakeholder driven recommendations for aviation security undergraduate and graduate degree programs. Each stakeholder brought his or her own unique perspective to the issue of aviation security education. A major factor in determining the credibility of information obtained through discourse analysis resides with the individual participants. The purpose of conducting interviews is to extract from the richest possible sources information that is pertinent to topic being investigated. Table 4 identifies the primary areas of expertise of each of the participants. Table 5 further illustrates the depth of knowledge of the participants and the fact that many participants had extensive knowledge in aviation, security, and education. This cross pollination enriched the study and provided a depth of knowledge not anticipated at the beginning of this study. This is one of the strengths of the exploratory and evolutionary nature of qualitative research.

Table 5.

Depth of Knowledge of Participants

Participant	Secondary Areas of Expertise	Comments
1	Aviation, Executive Protection, Law Enforcement	Participant #1 has worked specifically with the aviation industry for the past decade and conducts numerous training sessions with law enforcement and security every year.
2	Intelligence, Anti and Counter Terrorism	Participant #2 publishes an electronic security bulletin read world-wide.
3	Aviation, Executive Protection, Training, International Relations	Participant #3 is a retired Special Forces Commander with a wealth of foreign duty experience, in addition to his security expertise.
4	Security, International Relations	In addition to his academic credentials, Participant #4 has written five books on a wide range of topics and has world-wide law enforcement and security contacts including close ties with Israeli military, police, and security forces.
5	Law Enforcement, International Relations	In addition to her academic credentials, Participant #5 has worked and lectured world-wide including China and Romania. She has served on numerous prestigious law enforcement panels.
6	Federal Law Enforcement, Education, Public Policy	In addition to his international security experience, Participant #6 has served over 25 years with the FBI, and holds a Doctor of Philosophy Degree from the University of Southern California.
7	International Relations, Law Enforcement, Education, Public Policy	In addition to her Law Enforcement credentials, Participant #7 has traveled extensively and has a wealth

Table 5. (continued)

Depth of Knowledge of Participants

Participant	Secondary Areas of Expertise	Comments
		of experience in policy development and accreditation of Law Enforcement, Training, and Emergency Communications Agencies.
8	Training and Educational Techniques, Law Enforcement, State and Federal Law, Policy Development	In addition to his vast knowledge of and Federal Law, Policy Risk Management, Participant #8 lectures extensively on a wide range of topics. He is a respected educator and trainer, and is in constant demand.
9	Explosives, Open Source Intelligence, Terrorism, International Crime, Financing of Terrorist Organizations	Participant #9 is not only an expert in matters of aviation security, but he instructs law enforcement, military, and aviation personnel on a wide range of threat-related issues. He also publishes an international open source intelligence document.
10	General Aviation, Business, Security	Participant #10 has a vast knowledge of the aviation industry having worked in the profession for over 30 years, but he also has done extensive research in aviation security, specifically in the area of general aviation. He has published numerous articles on a wide variety of aviation-related topics.
11	Airport Security Planning	Participant #11 has extensive knowledge of general aviation facilities and has reviewed hundreds of airport security plans.
12	Criminal Investigative Techniques, Military Security Procedures, Training	Participant #12 has participated in and commanded security forces in both peacetime and combat operations.

Table 5. (continued)

Depth of Knowledge of Participants

Participant	Secondary Areas of Expertise	Comments
13	Establishment of Airport Operations, Flight Instruction, Education, Aviation Business	In addition to his vast aviation experience, Participant #13 has a wealth of knowledge in security having established airport operations in some of the most hostile environment on earth. He teaches at the collegiate level and is extremely well-versed in the business aspects of airport operations.
14	Education, Human Error, Flight Discipline, Military History, Governmental Operations	Participant #14 has authored five books and dozens of aviation related articles. He holds a Doctorate of Education and has taught extensively at the university level. He is recognized as an expert world-wide on matters of flight discipline and human error. He consults internationally and is experienced in curriculum design.

The interviews were transcribed and coded using Hyper-Research software. Once coded, reports were generated on each participant listing all codes in the three primary areas of concern addressed by the objectives of the study including: skills, knowledge bases, and course work.

An additional code was added for "additional contributions." This code was added to take advantage of participant insights into specific areas of interest that might impact curriculum design, content, or overall success of the program. The following is a discussion of findings by participant.

Participant #1

Participant 1 has extensive experience in the field of law enforcement, executive protection, and aviation security. He holds a Bachelors Degree in Criminal Justice and has trained extensively in the United States and abroad. He has worked in line management, supervisory and administrative positions. He has been a Federal Air Marshal and served in a supervisory capacity with that agency. He is currently employed by the Transportation Security Administration (TSA) working in the field of aviation security. He has traveled world wide participating in and providing training in aviation security.

Skills

Based on his background and experience, Participant #1 believed that aviation security programs should develop and enhance skills in three primary areas: people skills, technical skills, and thinking skills. People skills aid in essential team building and coordination efforts, technical and computer skills increase efficiency, and thinking skills allow students to problem solve and develop solutions.

Participant #1 believes that the development of people skills which will aid in liaison work, team building, and the forging of alliances are critical for security personnel. Those entering the field must have the ability to work well with others and coordinate the efforts of other individuals, groups, and organizations. The development of diplomatic skills is crucial to future aviation security leaders. The aerospace system consists of a multitude of interlocking organizations all with varying goals and differing agendas. Liaison functions are essential to making sure everyone is working together toward a common goal.

The ability to communicate well is essential to working with and for others. Writing and speaking skills are powerful tools of persuasion that can be used to sell needed security programs and procedures to both individuals and groups. According to Participant #1, "we have to be able to look to the future and sell that program." Only those with strong communications skills will be able to accomplish that goal. The skill to negotiate, sell others on your ideas, and resolve conflicts cannot be overemphasized.

Human behavior plays a vital role in aviation security. Participant #1 stated, "…we need to teach our people to be students of behavior, and I don't mean just profiling, but true students of behavior." He continued by pointing out the importance of understanding other cultures. In light of the global nature of aviation security, there is a genuine need for those who have the skill to be culturally sensitive. A failure to properly understand other cultures can lead to a complete misunderstanding and improper interpretation of behavior. Aviation security personnel must, at a minimum, understand the culture of nations posing the highest threat.

There is a need for people with the skill to react appropriately to all circumstances, "people who are not going to over react but not under react." The skill to react appropriately may be the ultimate people skill. Proper reaction to circumstance is a product of education, training and experience. Students must understand how critical it is to react appropriately and start developing that ability very early in their careers.

Participant # 1 pointed out that, "Technology does drive the train in a lot of ways." We live in a computer oriented society and aviation is heavily involved in that automation process. Given the rapid increase in automation, computerization, and

technology, students must possess computer skills and the ability to use emerging technologies.

New technologies such as advanced x-ray machines, chemical puffers, biometrics, and facial recognition software, are all part of the arsenal available to security personnel. Students seeking employment in the aviation security field will need to understand this technology and develop the skills needed to operate, maintain, and improve equipment utilizing this technology. Participant #1 does point out that there is no technology that can replace a well trained, thinking, individual capable of independent action.

There is a need for aviation security personnel who have the ability to think proactively with the flexibility needed to adjust to changing environments. Participant #1 suggested that analytical thinking skills are needed for students to understand threats, assess risk, and develop countermeasures that will aid in the mitigation of that risk. He also believed that design skills are needed to incorporate threat assessment and risk analysis into safe structures with flexible resilient security systems.

A critical part of the design process includes research skills which allow one to stay current on new innovations in the field that may be applied to security issues. To remain abreast of the latest developments, students must possess basic research skills and have the ability to understand technical writings concerning aviation security devices.

Knowledge Bases

Participant #1 believed that knowledge bases should include a macro view of the aviation system, theory of flight, security technology, intelligence, history of terrorism, principles of security, risk assessment, human behavior, systems design, and aviation law.

He reiterated that these knowledge bases are critical for the development of skills needed in the aviation security industry.

Participant #1 emphasized that an overall understanding of the aviation industry is critical for security personnel. The industry is massive with numerous components and students must have an overall understanding of these components and how they work together. In addition, students need to understand the "nuts and bolts" of flying not to make them pilots, but so they understand, at a minimum, "how planes fly and why they don't."

He emphasized the need for a basic understanding of technology stating, "You have to have a very good technology background." Aviation security technology is moving forward at a record pace and those wishing to be active in the field must understand and be able to apply that technology. The aerospace industry now uses a wide range of technologies including biometrics, video and audio surveillance, and bomb detecting devices, to name only a few. The technology knowledge center requires constant attention due to its ever changing, ever improving nature. Students must understand the role of technology, its limitations, and how it interfaces with the human element.

An understanding of the history of terrorism could prepare those entering the field with a basic understanding of past threats which coupled with current intelligence will allow them to make valid risk assessments. Flexible and resilient systems can then be designed based on those assessments. Participant #1 believed that history, intelligence, principles of security, risk assessment, and systems design all work together to prepare students to meet future challenges.

Recommended Course Work

Participant #1 has a strong interest in history and believes that history is a key foundational knowledge base. History does repeat itself and a course in the history of terrorism would provide students with basic information they will need to identify trends, establish methods of operations, and make more accurate threat assessments. An overall history of aviation provides basic information needed by practitioners in the aerospace arena and should be included in any aviation program. A basic course in principles of flight is also a critical part of the student's foundational knowledge base and can be taught from an historical perspective.

Courses on intelligence, threat assessment, and risk management all play essential roles and contribute to the student's ability to ultimately design functional security systems. To accomplish that ultimate goal, students must understand the basic principles of physical security, security technology, aviation law, and system design. Since all threats originate with humans, courses in human behavior, world culture, and the role of religion in terrorism would also contribute to students' ability to contribute to the aviation security industry.

In addition, students need to have a clear understanding of the business aspects of the aviation industry. Participant #1 pointed out that aviation security must work with airport management in order to obtain a balance that will provide for security of passengers, employees, and the public at the same time allowing enough freedom to insure the business can operate and remain profitable. Courses in economics of aviation and airport management could provide students with the understanding they need to make prudent security decisions palatable to management.

Additional Contributions

Participant # 1 pointed out that aviation security is very much a global problem and stated that we have to, "…look at the overall threat around the world daily to see how that affects us locally." He went on to state, "aviation security is very much a process, from start to finish, from global to local." The global nature of threats to aviation and our need to use global threats in our local threat assessment is a point well taken.

Participant #1 also pointed out the wide diversity of jobs available in the aviation security industry. The Transportation Security Administration alone employs over 46,000 people in a wide range of security positions, from screeners to Security Directors. The number of Federal Air Marshalls is classified, but significant; and many Federal agencies such as the Federal Bureau of Investigation now have large elements dedicated to certain aspects of aviation security.

On the local level, all major airports either hire their own security police or contract with local law enforcement agencies to meet airport needs. Private security agencies contract with both government and private concerns to meet special security needs. In addition, airlines have their own security personnel who provide a wide range of services through their corporate security offices.

Participant #1 believed that, "…we are headed for more regulation, not less…, and "…we're headed for more security, not less…". As an added emphasis, he pointed out that the September 11, 2001, attacks have resulted in the, "largest reorganization since the Department of Defense in World War II." He believed there will be additional attacks which will add regulations, increase security, and establish an even greater need for trained and educated personnel.

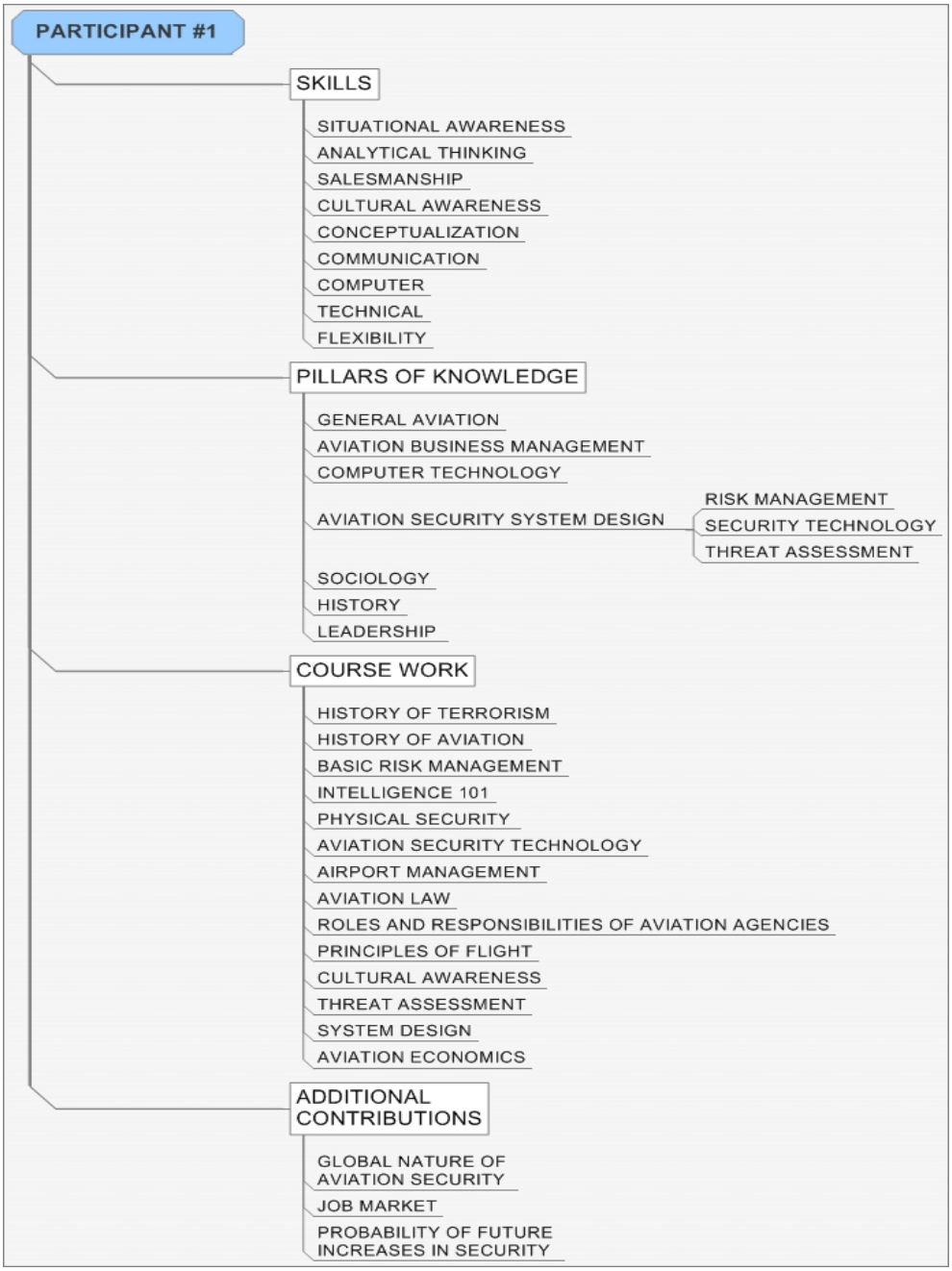

Figure 5. Participant #1 Overview

Participant #2

Participant #2 is originally from Ireland but has been living and working in England since 1984. He has over 20 years of experience with the United Kingdom (UK) police forces. He was initially assigned to the Anti-Terrorism Unit before being transferred to the Counter-Terrorism Intelligence Group. During his 15 years experience in that field, he attended numerous training courses including the UK Defense Intelligence and Security School. His most recent experience includes service in the British Aviation Security Office. He also publishes a regular aviation security bulletin read worldwide.

Skills

Participant #2 believed that the primary skills needed in aviation security revolve around leadership and communications. When asked, as an employer what he would consider of most practical value, he stated: "I would want somebody who has the ability to take control of a situation....it is good leadership, good communication…it all boils down to more than anything."

The implementation of decisions requires people skills and the ability to communicate clearly and effectively. When asked about key skills needed by personnel in the aviation security field Participant #2 said, "I would say that number one is good communication skills…". The ability to communicate encompasses not only oral communications, but writing and presentation skills, as well. Written procedures must be clear, concise, and easily understood if they are to ensure proper application and the desired result.

Participant #2 believed that leadership, communications, and the skills inherent to those two key elements are critical to those seeking to make a career in aviation security. His experience with a wide variety of threats has ingrained in him a very strong belief that people are the source of solutions not technology.

The ability to collate information from a wide variety of sources, analyze that data quickly and make situational appropriate decisions without over or under reacting requires a host of skills. Participant #2 pointed out that one of the most important skills needed is the ability to separate fact from media hype. He believed that, "anybody working in that sort of environment needs to be able to look at threat assessments based on the exact information they have in front of them, and not over-react to it. Security personnel must be resistant to media influence: "…you need somebody who is going to look at what exactly the threat is, not what the media tells you it is."

Analytical skills are essential to making reaction appropriate decisions. However, that analysis must be based on a deep situational awareness. Participant #2 emphasized the need for aerospace security personnel to have the deductive skills needed to use general historical information coupled with specific local facts to obtain a clear view of what is actually unfolding. It is that clear understanding that will allow efficient and effective security decisions to be made and ultimately implemented.

Knowledge Bases

Participant #2 believed that effective aviation security is dependent upon the ability to draw and coordinate information from a wide variety of knowledge bases that fall into three general categories; information, analysis, and behavior. Information

provides the raw data necessary for analysis which concentrates and makes information usable, while behavior dictates how and if that information will be used.

Information comes from a wide variety of sources. When one thinks *information* in the world of security, the first thing that comes to mind is intelligence. Participant # 2 believed that there is a basic misunderstanding and overprotection of what has been termed intelligence information. He pointed out that, "Intelligence in many cases is overrated and it tends to be something that is highly protected unnecessarily… there is a huge reluctance to share intelligence between government and the private sector."

Students should be exposed to basic knowledge concerning intelligence and the fact that most useable intelligence information is not classified. To the contrary, Participant #2 stated that while there is a tendency to disregard open source information, "90% of the intelligence we want is out there, available on the Internet to anybody who finds it." An understanding of the basic nature of information and how it can be obtained is essential for potential aviation security personnel.

Participant #2 believed that teaching students to be intelligence analysts is not a realistic goal since the production of good intelligence products takes "a team of analysts, and researchers." However, it is possible to provide an understanding of how information is obtained, classified, shared, and used in decision making.

Participant #2 also believed strongly that technology is an important element of the information gathering process, but it does have its limitations. He pointed out that technology can not take the place of a human being with knowledge of human behavior. Technology simply does not have the ability to pick up the nuances that signal nervousness, guilt, or apprehension and then be capable of connecting those behaviors to

the present environment to determine appropriateness. Knowledge bases dealing with behavior, technology, and the human/technology interface are critically important to future security personnel.

A final aspect of information that Participant #2 believed strongly about was history. He pointed out that historical information is critical to understanding current threats, and determining risks. He reiterated that most, if not all, the security measures now in place can be traced to historical events. He stated,

> "In the UK … the counter terrorists policing of airports was introduced following the rash of Palestinian hijackings in the late sixties and seventies. Our carrying of large weapons was in response to Rome and Vienna in 1985. Even…100% baggage screening was introduced in the UK following Pan Am 103 in 1988…"

An historic knowledge base helps to bring perspective to current issues and problems.

Analysis, as with the entire field of aerospace security, is a process affected by many variables. Policies, both foreign and domestic have a major impact on the field of aviation security. To understand threats, one must understand the source, which is often a policy. Any analysis of aviation security issues must take into consideration the policies that influence the aerospace industry both directly and indirectly. Participant #2 specifically mentioned the need for understanding foreign policy which is a knowledge base many have never been exposed to.

Effective analysis can only be attained if personnel possess base knowledge in the areas of risk analysis, threat assessment, and ultimately, decision making. Students must have foundational knowledge in these areas to be successful in the aviation security field.

Participant #2 was adamant that security personnel be able to analyze situations based on facts, not on emotion, public hysteria, or media interpretation.

The final behavior category involves human behavior. Participant #2 pointed out several aspects of behavior on both sides of the equation. He mentioned the psychology of both perpetrators and victims, the need to think as terrorists in order to become proactive, and the need for security personnel to understand and be capable of interpreting suspect physical behavior.

Students should be exposed to the knowledge base of victimization and understand how different individuals and groups react to being attacked. Participant #2 pointed out that due to the United Kingdom's long experience with terrorist type attacks from a variety of sources, they have developed a different national mind set. He stated, "we have had terrorism in the UK from international groups coming from the middle east, coming from North Africa … we've also had IRA attacks back to the late 1960's." He explained that due to their long experience, they have adjusted to more appropriate levels of response.

They and other nations with similar experience, such as Israel, react differently to attacks than do less experienced nations. They strive individually, and as a group, to return to normalcy as quickly as possible. This approach denies attackers extensive media attention, which many crave, and sends a clear message that the country refuses to be defeated. Students must understand how their respective nations will respond to attacks and why.

Finally, Participant #2 discussed the threat to aviation posed by the mentally ill. He stated that "…some of our biggest threats come from people who are mentally ill…".

These threats run the entire spectrum from minor to critical but security personnel must be exposed to knowledge bases that prepare them to deal with the mentally ill. It is critical that students have at least a basic understanding of these issues.

Recommended Course Work

The knowledge bases identified open the door to numerous courses. This participant's focus on leadership and communications skills would dictate an emphasis on courses in that arena. Basic leadership courses allow students to grasp the fundamentals while advanced leadership could focus on the development and refinement of skills needed by leaders to effectively coordinate operations, motivate others, and accomplish needed security tasks that result in a safer environment. Follow-on courses in decision- making, threat analysis, and risk assessment help hone those skills.

Participant #2 emphasized the need for appropriate reaction based on sound situational awareness of both the global and local environment. This awareness can be provided by coursework in the areas of history, foreign policy, and analysis. Situational awareness allows security personnel to react with the balanced approaches that best meet the needs of the industry as a whole.

Participant #2 pointed out the economic realities of aviation security stating that most aviation businesses see security expenses as "dead money" or funds that do not produce a profit. While this is a very constricted view of reality, it is one to which many aerospace managers subscribe. Courses in the business and economics of aviation can help aviation security personnel develop balanced systems that match the security needs with the business reality.

The fuel that fires a leader's decision-making engine is information. Courses in the basic concepts of intelligence, technology, computer systems, and information processing provide all security personnel with skills they will need to be effective in an ever changing environment. These classes coupled with courses on the history of aerospace and threats to aviation help round out information knowledge bases.

Participant #2 emphasized the need for communications skills which can be developed by specific courses focused on oral and written communications. The skills evolving from this broad communications knowledge base can also be enhanced by teaching techniques that require students to practice these skills on a regular basis. These skills are essential regardless of the position held in the aviation security field. Participant #2 concluded that, "in my view, anybody working aviation security needs good communication skills."

Participant #2 spent considerable time discussing the need to develop a broad behavior knowledge base. That knowledge base requires course work in the areas of deviant behavior, mental illness, and victimization. These and similar courses will add to the behavior knowledge base and aid in developing skills that security personnel will find essential in dealing with complex behavioral issues.

Additional Contributions

Participant # 2 made several observations that should be considered by those seeking to improve the field of aviation security. These observations in brief are:

- Current aviation security efforts are almost entirely reactive in nature.
- Aviation security is often viewed as cost ineffective by aviation managers.

- Aviation security personnel are not well paid, and do not enjoy a great deal of prestige in the industry.
- Critical intelligence information held by governmental agencies is often not shared with the private sector responsible for aviation security.
- The key to successful aviation security is the ability to coordinate many disciplines and quickly assess information from a wide variety of sources.

Participant # 2 brought to the project an international perspective that was both interesting and insightful. Aviation security is very much a part of a shrinking world which requires a global effort to attain success.

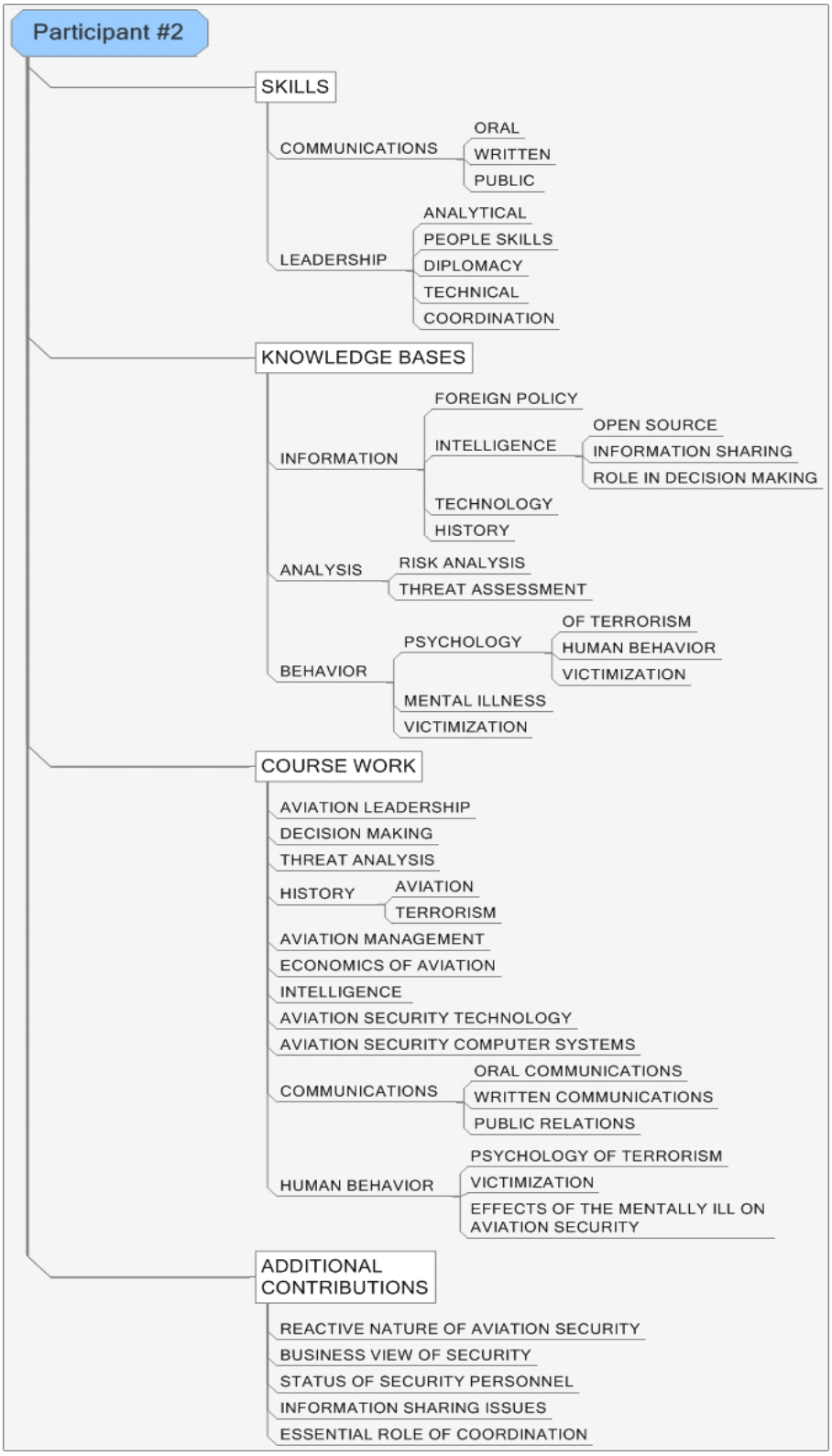

Figure 6. Participant #2 Overview

Participant #3

Participant #3 has an extensive military background having retired as a Special Forces commander. His post military service has included world-wide experience in a variety of assignments. He has taught in the field of security, worked for several governmental agencies including the U.S. State Department and the Federal Aviation Administration, and for the past several years has been involved directly with aviation security in the private sector. His broad base of experience on the international stage brings a rich source of information to the study.

Skills

Participant #3 focused more on general knowledge bases and coursework than on specific skills. He began the interview by pointing out the need for an aviation security collegiate program saying that, "There is no school that will teach you the skills that you need to be an adequate aviation security expert." He believed that the field is currently occupied by ex-law enforcement officers and federal officials who have had a few classes and are for the most part, "checklist checkers." He believed that there are very few true security professionals now working in the field of aviation security and that the door is open for a major university to step forward and fill the void.

Participant #3 believed that analytical skills and the ability to be flexible in one's thinking are critical. He also placed a great deal of importance on security personnel having the skill to prioritize and, thereby, spend finite resources wisely. Cultural and observational skills are needed to avoid causing incidents through misunderstandings and to allow security personnel to make proper assessments of behavior.

He pointed out that modern airports have many agencies represented within the overall organization and that communication and coordination skills are needed to bring focus to efforts put forth by those agencies. He provided an example of an airport in Pakistan where airport security is broken down into four primary parts: outside terminal, inside terminal, aircraft, and perimeter security, with each sector being controlled by a different entity and no communications between the various groups. This is especially important in the development of crisis plans.

Participant #3 believed that organizational skills in planning how to react to crisis events are critical. The ability to organize people, communicate, handle tactical placement of equipment, assemble assets, recognize the need for contingencies, and coordinate efforts can mean the difference between success and failure. He provided an example of a mass casualty planning session at a major motor speedway where planners had decided to use helicopters to evacuate casualties but had no contingency plan for bad weather.

Knowledge Bases

Participant #3 believed that security is the seminal knowledge base that must be created first. Once that knowledge base is established, other foundational knowledge bases can be moved into place. The overarching security knowledge base includes such areas as physical security, procedural security, and principles of general security that apply to all security situations including aviation security. He also believed that an overview of the whole system is critical, especially as it pertains to rules and regulations, He stated, "You've got to know not only the current regulations but you have got to know the rulemaking process and how that can change literally over night." Additional

knowledge bases directly related to security deal with threat assessment, recognition, and risk management, each of which is a knowledge base unto itself.

Participant #3 believed that students must have a clear understanding of the business realities of aviation. He stated, "The way to assure absolute security in an airport is don't let any airplanes fly, so there has to be some middle ground." That middle ground can only be found if security personnel understand the business aspects of aviation that allow them to find reasonable solutions to security issues compatible with business needs.

Concerning the role of intelligence, Participant #3 believed there is a need for overall understanding of intelligence, what it is, how it is gathered, the agencies involved and how information should flow. Students should be taught how to develop "essential elements of information" and how those elements change based on the situation and world conditions.

He believed that those involved in intelligence analysis must have an aptitude for such work and that it may be very difficult to train those who do not have those instincts. He also believed that knowledge in the area of technology is important, but there must be an emphasis on the human interface to technology and a clear understanding that technology is, "…an observation device…" and "…unless there is a human behind it, it is useless to you…".

Course Work

To develop the needed skills and knowledge bases Participant # 3 recommended courses in the following areas; security, analysis, intelligence, crisis planning, risk

management, and airport management. As with the knowledge bases Participant #3 believed the place to begin is with security.

He recommended a course in principles of security, which educates the students on security procedures and techniques that are applicable across the entire field of security including aviation. More specific courses on physical security and procedural security would round out the student's understanding of the mechanics and personnel issues involved with security. Participant #3 also believed that classes on organizational design would help students avoid problems described in the Pakistan example mentioned earlier.

While he believed analysis and the ability to correctly assess situations and issues are important, Participant #3 did not believe that courses in statistical analysis would be of particular value. Courses in threat recognition, threat analysis, pattern recognition and information processing would be of greater practical use. It is essential that security personnel be able to extract, "nuggets of information that you need to build a pattern."

To insure that aviation security students understand the need for balanced security measures, Participant #3 suggested classes in airport management that cover the business aspects of aviation essential to making a profit. Also, in the management arena, he stressed the importance of learning how to properly develop crisis management teams.

Participant #3 emphasized the need for students to understand diverse cultures. He believed course work in the area of cultural diversity and behavioral analysis would allow students to avoid unnecessary incidents and more accurately interpret behavior. These courses become even more important in an ever-shrinking world with increasing cultural contact.

Additional Contributions

Participant #3 pointed out early in his interview that in the United States there are no laws or regulations requiring a set standard for security personnel. Therefore, very few true security personnel exist. He was clear that while a growing need exists in this area, no major university had stepped forward with a curriculum to meet that demand. He stated, "… what you see is a sort of ad hoc organization, that to me, doesn't go from the very basics … through the ability to design a security system."

He recommended a "staged" approach to curriculum design similar to the military system where levels of increasing responsibility have corresponding educational requirements. Participant #3 emphasized the need for students to understand the layered approach to security and strongly recommended heavy emphasis on practical exercises through the curriculum. He also pointed out that regardless of how well a system is designed, it will fail. Students need to understand how to recognize and develop systems that fail well. Practical exercises will aid in that learning process.

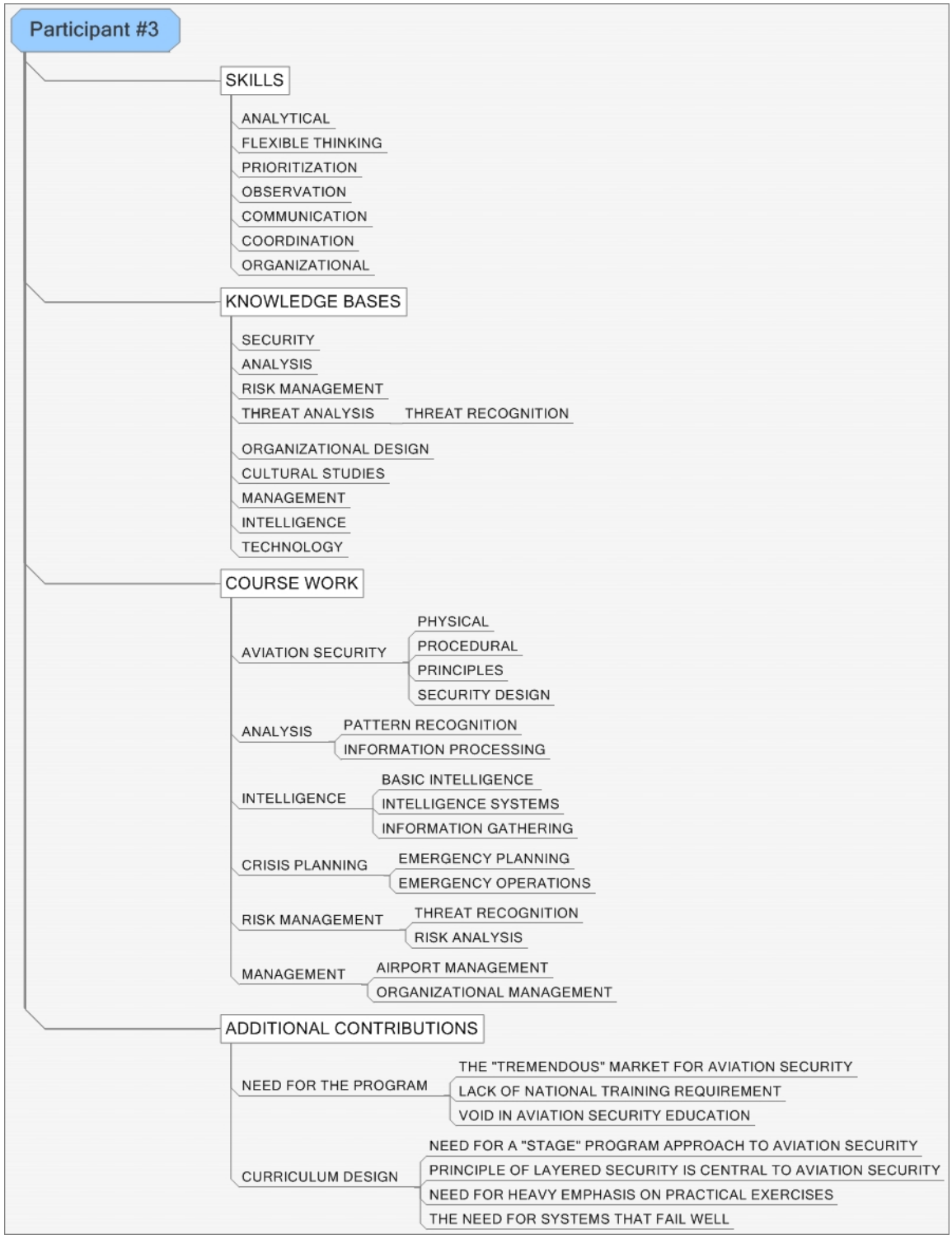

Figure 7. Participant #3 Overview

Participant #4

Participant #4 holds a doctorate in sociology and is a professor at a major research university in the United States. He has extensive experience in the field of criminal justice education. He has chaired criminal justice programs, lectured extensively on a wide range of subjects at both the undergraduate and graduate level, and has published on a wide range of topics. He has authored five books on topics ranging from terrorism to community policing and has many years of experience in academic administration and curriculum design. He has years of experience as a major university chair and has traveled and lectured world-wide.

Skills

Participant #4 did not respond directly to the questions concerning skills that those going into the aerospace security field should possess, but the knowledge bases he discussed, and the course work he suggested were indicative of skill sets needed in the aerospace security arena. Analytical skills, communications skills, critical thinking skills, and people skills are all common to the areas mentioned by Participant #4.

Knowledge Bases

Participant 4 discussed security, cultural studies, psychology, intelligence, and business knowledge bases as being relevant to aerospace security programs and provided some unique insights regarding how they might apply. His extensive world travel and global understanding of issues contributed greatly to the discussion. Due in part to his international experience, Participant #4 postulated that understanding security techniques of other parts of the world is a needed knowledge base.

During any discussion of aviation or aerospace security, the Israeli security system will inevitably arise, usually early in the conversation. Participant #4 pointed out that the difference between the United States and Israeli systems is, "not so much in the culture as a stand alone concept … the difference is in the positions that their cultures put on how to resolve the problem." He referred to the security problem as a disease and explained that the Israelis believe it is essential to deny the terrorists as much of the media attention they desire as possible. He said, "It sends a moral message. The Israelis found out that one way to overcome the disease, if you will, is by getting back to normal as soon as possible."

Participant #4 believed that experience has played a key role in the development of the Israeli aerospace security system, and that should the United States experience the same level of threat, our systems would substantially change. While the Israeli system has become an icon, there are many other systems around the world from which students could benefit. The study of international security systems will provide a valuable knowledge base for students, especially when coupled with cultural studies.

Understanding different cultures is key to understanding why people and groups act or react as they do. Participant #4 has had extensive experience with cultures from around the world and believes that this knowledge base will aid students in understanding threats and planning appropriate responses.

While cultural studies provide an understanding of groups and cultures at large, psychology is of great assistance in understanding how individuals react within those groups or cultures. Specific courses in the area of psychology and even criminal justice could provide foundational knowledge bases that will aid aerospace security students.

Participant #4 believed intelligence is a viable knowledge base but was quick to point out the need for caution in the use of instructional materials. An overall view of intelligence from the proactive standpoint where, "intelligence is trying to identify indicators of potential damage before it actually happens" is acceptable and would be beneficial.

Participant #4 also saw the need for a business knowledge base that would include areas such as cost-benefit analysis and organizational studies. These knowledge bases will provide students with a deeper understanding of the business realities of security and aid them in the development of security systems that can accomplish security goals while allowing business to continue. Industrial relations will also increase the student's ability to understand the business aspects of aviation and relate to management in a positive manner making acceptance of security proposals more likely.

Course Work

In an aviation security program security courses are central. Participant #4 believed that we begin our work on future programs by examining the past. He recommended a course in the history of aviation security to be followed with more specific security courses that cover the principles of aviation security including such topics as, "rings of security" and how layered security systems are established and function. A course on proactive intelligence would provide students with an understanding of how intelligence can help prevent events.

Participant #4 recommended courses in security technology that will provide students with an understanding of available technologies, how those technologies are currently being applied in the field, and what future advances may bring. Finally, in the

area of security, he recommended course work that would expose students to world-wide approaches to aerospace security. This course would cover the Israeli systems but also other systems that are using new and innovative approaches to security.

Cultural courses might include approaches to combating terrorism and cultural reactions to threats. While many other courses could be added that contribute to overall understanding, it is important that these courses remain focused on security and cultural effects relevant to security concerns and not digress into cultural appreciation events. Understanding how other cultures approach their security issues will allow students to broaden their understanding of security in general and assist them in dealing more effectively on the world stage.

Psychology of terrorism will help students understand not only why people commit terrorist acts but also how those acts affect victims and, ultimately, shape reaction. The more students are aware of the psychological aspects of terrorism, the better prepared they are to react to and, hopefully, prevent such acts. Again, courses in this area need to focus specifically on the problem under consideration.

Participant #4 recommended that a cost analysis course, and, more specifically, a course in cost-benefit analysis of security, would be very beneficial. Those courses coupled with an aviation management course and a course on organizational design could help students understand the business aspects of aviation and design effective, affordable, systems that are palatable to management.

Additional Contributions

Participant #4 was unaware of any degree producing programs in the United States in the area of aviation or aerospace security, but he pointed out that if there were a

demand in any given area with sufficient growth potential then, "higher education will go there." He was aware of one university-based program in Italy but did not recall the name of the university. Given the current world environment, it would appear that the demand for aviation security programs does exist.

Participant #4 noted that there are two major concerns when developing a new academic program. First, what is "the natural academic home for the program," and second, where is the academic home that will best guarantee the nurturing development of the program?" He went on to relate his experience in the field of criminal justice.

Participant #4 was chair of a criminal justice department for 13 years when it was shut down for reorganization. He was provided the opportunity to find a new academic home and his research and experience led him in what many might think an unexpected direction. Most criminal justice programs reside in the realm of arts and science or liberal arts. But after study with the deans of various departments, Participant #4 arrived at the conclusion that the best fit would be in the area of health and human services.

Participant #4 pointed out that when building a new program one should search for the one that has the practical orientation for that degree program. For example, an aviation program could be a natural fit for a degree program in aviation or aerospace security and thus meet Participant #4's requirement for a nurturing environment.

Participant #4 also pointed out that creating a new program is not easy, particularly one that is fairly new and involves new concepts. In order to be successful, he believed that you must develop, "…what I would call a social movement whereby a university program with a certificate or degree is one component in building… the production of people who can work in this industry."

He believed the involvement of stakeholders is a key element in the development of this social movement. He stated, "You probably want to line up stakeholders…who are your potential partners in making this happen." That is exactly what this study is designed to do.

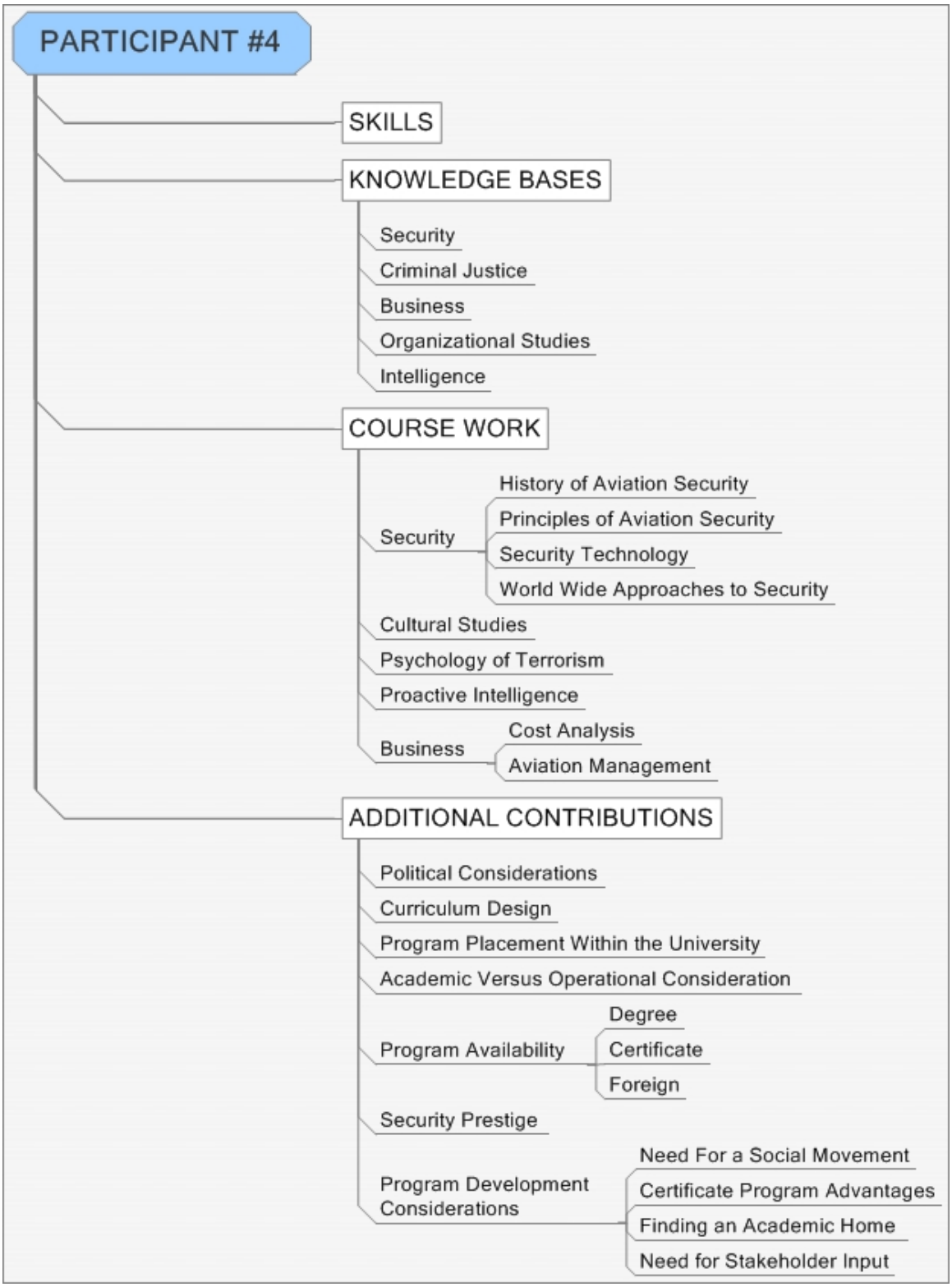

Figure 8. Participant #4 Overview

Participant #5

Participant #5 also has a distinguished academic background having served both as a professor and departmental chair. She has extensive experience with all levels of the criminal justice community and has conducted program and management assessments for numerous local, state, and federal organizations including the Federal Bureau of Justice Statistics of the U.S. Attorney General's Office. She has also been active on the international stage leading several academic missions to China and has been involved with democratization of policing in Eastern Europe.

She has authored and co-authored several texts and book chapters with numerous published articles and technical reports to her credit. During two leaves of absence, she served as the head of planning and research for a state corrections department and as a special assistant advising a state attorney general. She continues to hold the position of Chair of the Justice Administration at a major United States university.

Skills

Participant #5 saw a cross over in many of the skills and knowledge bases found in criminal justice and law enforcement to those needed in aviation or aerospace security. Certainly both fields need to have thinking skills, communication skills, computer skills, as well the ability to network, perform research, lead others, and understand administrative issues.

Thinking skills including problem solving, analytical thinking, and critical analysis are essential to both criminal justice and security practitioners. Even though the day to day duties of security and police differ, the development of those skills is central to both programs. The application of thinking skills may provide a means for both

enforcement and security to be more proactive in the prevention of incidents and certainly will provide personnel with the ability to react more effectively when events do occur.

Participant #5 also believed that communications skills are critical. She pointed out that as we apply more technology to any given field of endeavor, there is a tendency to lose our ability to communicate well. She reiterated that, "it is really important that folks in the more technical areas have good writing skills … good verbal communication skills…". Without these skills and the ability to understand group dynamics, it is often difficult to develop solutions to real world problems where everyone must understand both the technical and people issues necessary to develop optimal solutions to problems.

While technical and computer skills are needed, Participant #5 emphasized the need for networking and leadership skills. Without those skills, it becomes extremely difficult to accomplish complex tasks especially under adverse circumstances. The development of administrative and research skills provides balance and the ability to understand the business aspects of security and enforcement.

Knowledge Bases

Participant #5 supported an inner disciplinary approach saying, "…it is important to bring in broad based information and … let the experts present the curriculum." She commented that such an approach makes your degree stronger. Again, many of the knowledge bases applicable to the field of criminal justice are also applicable to aerospace security. She suggested that general knowledge in the area of criminal justice and law are important foundational building blocks for the program.

The development of thinking skills can be enhanced through several knowledge bases such as psychology and the problem solving aspects of management. Liberal arts studies, sociology, cultural studies, and global economics all provide the student with a broad base of knowledge helpful in understanding the situational awareness critical to effective decision making and planning.

On the more technical side, Participant #5 believed that knowledge in the areas of computer science, architecture, and global economics would also be beneficial. Participant #5 noted that there were no specific courses on intelligence gathering and use in the criminal justice curricula. However, it is touched on in several of the courses and is a needed core knowledge.

Course Work

Participant #5, who has a strong background in organizational issues, suggested that courses in organizational culture, organizational change, and administration would be appropriate for the program. She also advocated emergency preparedness and courses in homeland security dealing specifically with its structure, functions, and enabling legislation.

Participant #5 suggested that courses in terrorism and counter terrorism are important and could be made more meaningful by offering courses in cultural studies and global economics. Such courses would provide a deeper understanding of why events occur and the motivations behind terrorist activities. These courses also aid in risk assessment but specific course work in threat assessment, risk mitigation, and vulnerability assessment should be included in the program.

The roles of intelligence, computerization, and security related technology are also fertile ground for meaningful coursework. Participant #5 stressed the need for technical expertise but emphasized how important it is that communications skills be maintained so that the technical contributions can be understood by all. Therefore, communications skills such as writing and public speaking should be incorporated throughout the coursework.

Additional Contributions

Participant #5 suggested that the first question that should be answered in the development of any degree program should be, is there a need? She stated, "The question is whether or not this is an area where you really need a unique degree, or whether it is an area in which what you need are additional skills and knowledge you place on top of … another degree." In her own development efforts, Participant #5 used a very similar strategy to the one employed in this study. In the development of a new degree program in the area of computer forensics, she outlined the following process: "We put together a list of, if someone is going to be a digital forensics examiner, what knowledge do they need and what skills do they need, and then from those….we are trying to identify courses…" .

She also used stakeholder input to aid in curriculum development. In discussing the development of a certificate program on homeland security, she stated: "…we pulled together a big group of folks who were all doing some kind of work in homeland security and talked about the generic skills and knowledge that they would apply across the area." The procedures may vary somewhat but the essential elements of using stakeholders to

determine knowledge bases and skills, then working to determine appropriate course work, are constant and add validity to the study.

Since the direct and indirect costs of creating a new degree program can be substantial, Participant #5 believed that the economic realities will be a consideration in course development. Will there be enough demand to justify the universities' expenditures? Does the industry want or need the programs being considered? Is a degree program needed, or could the demand be met with a certificate program being layered on top of existing degrees? These are all valid questions that must be considered.

Participant #5 believed that online courses are highly beneficial and add to the availability of learning. When asked about the loss of one on one contact, she related that she often has extensive contact with students via email and, thus, may actually have more interaction with online students than those in a conventional classroom. The development of programs that can be remotely accessed opens up the economic potential and the educational reach of the university. Whether the program developed is a degree program or a certificate program, there should be a major online component present.

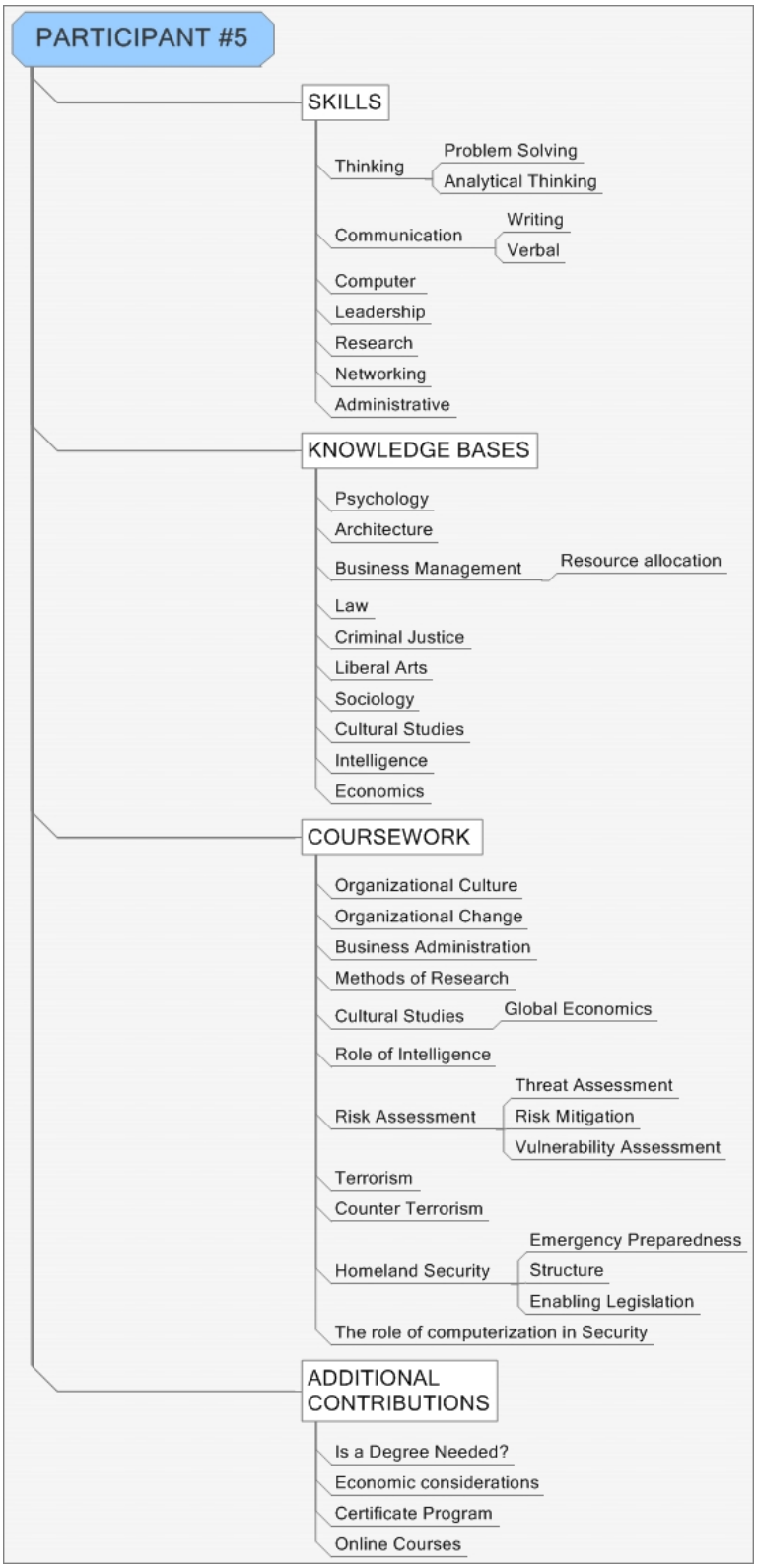

Figure 9. Participant #5 Overview

Participant #6

Participant #6 holds a Doctor of Philosophy degree, and has spent over 24 years in federal law enforcement, where he rose to the rank of Assistant Director of the Federal Bureau of Investigation. After retiring from that position, he became involved in the security field and was in charge of security for a major American company doing business in over 100 countries world-wide. His extensive experience in the world of academia, law enforcement, and private security provides a rich source of data and invaluable insight.

Skills

Participant #6 knows the value of leadership and how important it is to every endeavor, therefore he considers the development of leadership skills critical in the field of security. Communications skills are essential to good leadership and should be developed in potential security personnel. These skills could also aid in the development of training skills which are becoming more and more critical in the industry. Training of security personnel, the presentation of security programs to management, and dealing with the public, all demand both leadership and communications skills.

As head of security for a major corporation, Participant #6 has been called upon many times to justify programs to management and suggested that people skills such as salesmanship and collaboration are extremely important to security managers. Viable security plans that are cost effective and attractive to management are the result of specialized skills in the areas of research, planning, and analysis. These skills enable security professionals to not only create effective plans and have them accepted by management but also have them accepted by employees.

Participant #6 was the head of security for a company with over 55,000 employees and only seven security professionals. The ability to get midlevel managers, first line supervisors, and virtually all employees involved in security issues is a major concern. Technology and computer skills can aid in the process and should be developed but the ability to deal with people is paramount.

Knowledge Bases

Due to the complex nature of security and the fact that security touches virtually every aspect of the organization, Participant #6 strongly recommended a broad approach to knowledge bases. He believed that a wide base of knowledge in many areas provides a solid security foundation. The first knowledge base he recommended is security which encompasses several major subdivisions. Once a basic understanding of security has been established Participant #6 believed that it is essential for security personnel to understand the organizational theory and how organizations function.

One of the key tools for security professionals is risk management. Risk management has many facets and should be the driving force behind security planning and the implementation of security programs. Unfortunately, that has not always been the case, and Participant #6 believed that a thorough understanding of risk management and the processes involved are essential.

In order to accurately apply risk management principles, many questions must be answered. A good foundational knowledge of intelligence, how it is gathered, analyzed, and distributed, along with a clear understanding of cultural differences, are critical to security personnel. Participant #6 has a deep appreciation for cultural differences and

how they affect security operations. He strongly encouraged the establishment of a strong cultural understanding.

He also advocated a strong analysis knowledge base in general and specifically in the areas of risk, systems, and cost. Understanding the principles of analysis provides aviation security personnel with the ability to make more effective and efficient decisions which can increase credibility, prevent loss, and enhance security.

Since the vast majority of the world's infrastructure is in the hands of private industry, an understanding of business and business practices is also a valid knowledge base for students seeking to enter the aerospace security field. Participant #6 believed that security integration into the business will provide the balance between the sometimes conflicting needs of security and business.

Course Work

Regardless of the endeavor it is difficult to attain a successful outcome without good leadership. Participant #6 stated that leadership is a critical element of security, and courses designed to enhance leadership skills should be included in the curricula. Since communications is a key element of leadership, courses on effective communications should also be included. Requirements for effective writing and speaking should be incorporated into all course work.

To develop skills and knowledge bases in the thinking areas, Participant #6 recommended coursework in the areas of decision making, critical thinking, and analysis. These courses could provide students with skills they can use in many areas of security and enhance their ability to perform under pressure.

As previously mentioned, Participant #6 recommended a broad-based approach to the study of security. He recommended a basic course in the principles of security followed by courses on physical security, personal security, information, and security management. Security, when it functions properly, is driven by risk management and integrates into the fabric of the organization.

Courses on intelligence should be included, or at least sections in existing courses, should outline the role of intelligence in security and how security professionals can access and use intelligence to aid them in their work. Since security is such an integral part of the organization, Participant #6 suggested that a course on organizational integration would also be appropriate.

The centerpiece of security is the prevention of loss, be it economic or human in nature. Participant #6 believed that courses in risk management and associated topics would provide the basic skills necessary to enter the field of aerospace security and would assist them in meeting that primary goal. These courses combined with those previously mentioned, such as analysis, should aid students in becoming effective risk managers adept at planning, developing, selling, and implementing meaningful programs that can prevent losses and save lives.

Based on his years of experience in private security, Participant #6 fully appreciates the need to understand the balance between business and security. Therefore, he recommended a course on business which would include aspects of decision-making, business economics, and policy making. It is essential for students to understand the business realities as they work through security issues.

Finally, Participant #6 suggested that courses that provide cultural awareness are essential to the development of a well-rounded security professional. The company he worked for had interests in over 100 countries and he quickly became aware that culture can have a direct effect on security. In an ever-shrinking world, students can expect to work with people from many countries and face threats from foreign cultures. Understanding cultures other than our own is the first step toward solving many complex issues both in business and security.

Additional Contributions

Participant #6 provided many interesting perspectives, many of which have already been mentioned. However, some bear repeating for emphasis, particularly his belief that due to its nature, a degree program on security, must take a broad-based approach. There are few topics that cannot find an application in the field of security, and curriculum designers should remain open-minded and consider the multiple facets of security.

Participant #6 was adamant that cultural understanding is critical now and will only become more important with time. He believed that to be successful, security must incorporate into the organization, achieve buy-in from all levels, and be seen by management not as a cost center, but as a loss prevention center. In other words, security must not only be cost effective but profit producing.

Finally, Participant #6 pointed out the primary mission of security is loss prevention and that the only way to accomplish that primary directive is to base your plans on solid risk management principles. It is critical that security reactions be level appropriate. Too strong a reaction hurts business and causes a loss of credibility; too

weak a reaction results in loss and failure to meet the prime directive. Every skill and knowledge base mentioned, plus some, are needed to assure that proper response.

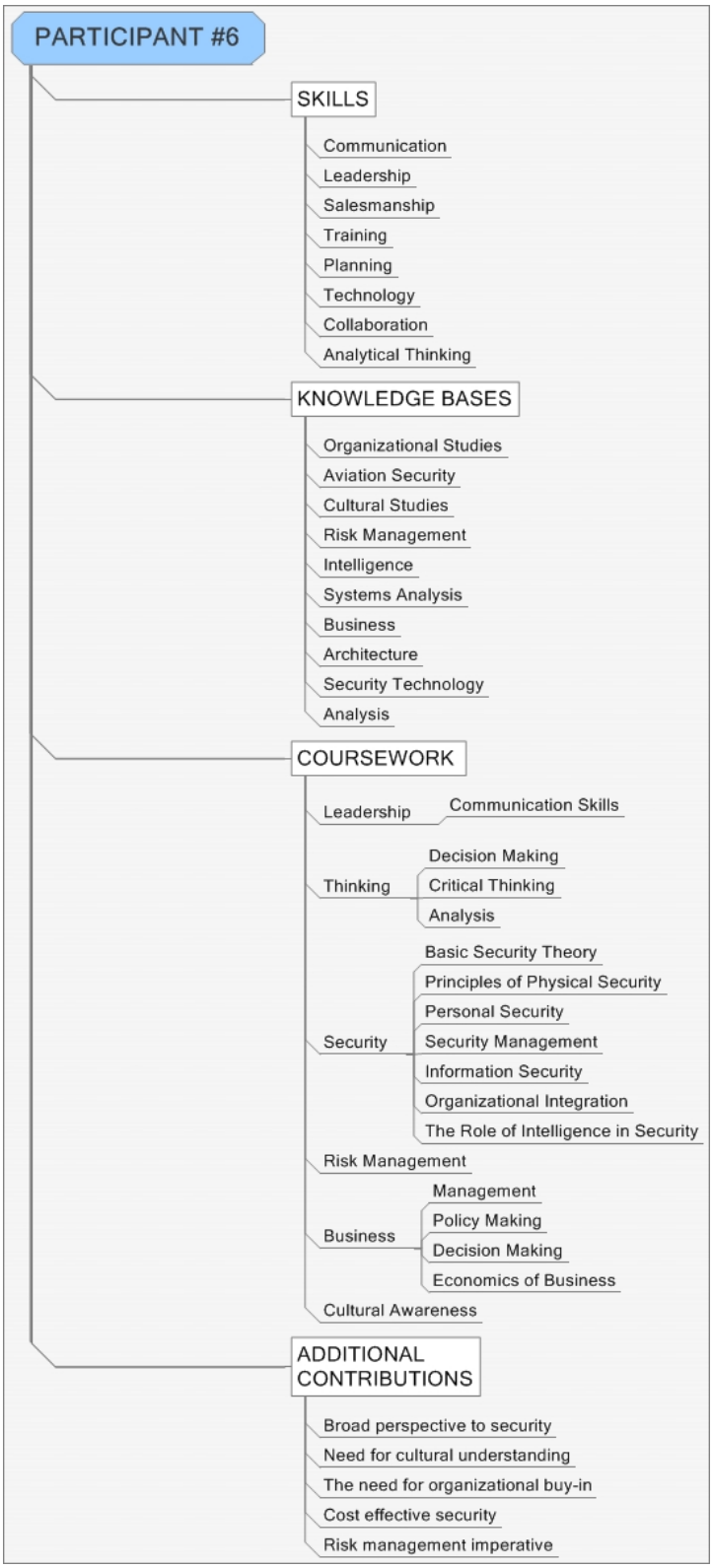

Figure 10. Participant #6 Overview

Participant #7

Participant #7 has over 25 years of experience in the field of law enforcement with the vast majority of the time being spent in administrative positions. She has many positions in the field of law enforcement and is a past president of an international organization for chiefs of police. She has a wide range of experience in the area of law enforcement accreditation and has served in several capacities with a major international law enforcement accreditation body. Her experience in the field of law enforcement, exposure to world cultures, and extensive background in accreditation establish her as a rich source of information applicable to the field of security and curriculum design.

Skills

Participant #7 focused on four primary skill areas, communications, inter-personal skill, analytical skills, and technological skills, all of which encompass several subordinate skills. Her vast experience in dealing with individuals from different cultures and socio-economic levels no doubt influenced her emphasis on interpersonal skills.

She also believed in the need for communications skills such as oral communications, effective writing, and the ability to make meaningful presentations. She stated, "You are dealing with people all the time so you have to be able to communicate and express yourself, both in writing and orally." All these skills aid in effective collaboration, facilitate team work, and enhance the ability to solve complex problems.

Participant #7 has seen a vast increase in law enforcement technology world-wide and strongly encourages skill development in that arena. The development of computer skills and the ability to effectively use the Internet and other informational sources is essential in the world of enforcement and security. Once information has been obtained,

analytical skills are essential to develop that information into a useable format for people working at the level of execution, whether it is a patrol officer or an aerospace security professional.

Knowledge Bases

Participant #7 emphasized the need for a firm ethical base upon which to build professionalism. From that solid foundation, knowledge bases in communications, technology, global studies, risk management, terrorism, and intelligence can be explored. Law enforcement and security are two different fields with many common areas of concern. One of those common areas is the need for effective communications.

Participant #7 believed that a key knowledge base deals with communications in general and more specifically personal inter-communications. In the realm of security and law enforcement, the primary threat will always be people. The ability to effectively and clearly communicate with others is an absolute necessity. The establishment of this knowledge base may require several courses, but it also necessitates the acceptance of a base philosophy that these skills should be incorporated in all classes throughout the curricula. Such a practice insures those skills are solidly established at the completion of the program.

Participant #7 has met and worked with law enforcement officials both nationally and internationally. She believed that the key to success is relationship building which begins with understanding. The more we know about one another's political systems, religions, economies, and cultures, the more likely we are to establish strong relationships resulting in cooperation and more effective security for all. Global studies are, therefore, a key knowledge base according to this participant.

Having such a strong law enforcement background, Participant #7 believed in risk management. She pointed out the connection between accreditation and risk management, and stated that since only 700 of the thousands of agencies in the United States are accredited, there is, obviously, much to be accomplished in this area. She believed that the establishment of risk management as a knowledge base would reduce liability and lead to more effective professional security services.

She also takes the global approach to other knowledge bases such as technology, terrorism, and intelligence. Participant #7 recommended that knowledge bases in these areas be established on a more global perspective allowing students to gain knowledge from the expertise of others from around the world. As an example, she cited the current practice of bringing Israeli experts to the United States to teach terrorism and terrorist tactics.

Participant #7 suggested that technology is a central knowledge base, especially with the advent of the Internet and the rapid transmission of information. Understanding security technology and information sharing systems is essential to law enforcement and security forces. The ability to use technology, and understand how those attempting to breach security are using it, is critical. These systems and technology support and enhance the final knowledge base of intelligence.

Participant #7 suggested that an understanding of the intelligence system would provide students with knowledge they need to insure that information gets from those who collect and analyze it to those who need it at the lowest level. She stated, “We are still struggling with how to use all the information, and to transfer it on a two-way basis.”

Providing students with a base understanding of the intelligence system may aid in developing more effective information sharing systems.

Recommended Course Work

Participant #7 strongly believed that interpersonal communications is a key element leading to success and recommends coursework in that area to aid students in developing new skills and enhancing existing skills. She reiterated that the ability to develop and maintain relationships with those, both directly and indirectly related to security, is essential to being successful and building networks that will aid in developing secure environments. Courses that aid students in learning to effectively communicate and network would greatly enhance their potential for success.

Having traveled extensively, Participant #7 also sees great benefit in global studies that will prepare students to be effective in an ever-shrinking global community. To enhance the ability to work and network effectively with others worldwide, Participant #7 suggested course work in the areas of global economy, religion, international law, world political systems, and global conflicts. These courses would aid in cultural awareness, which in turn, could assist in understanding events as they unfold.

As a law enforcement executive for many years, Participant #7 fully understands the essential role of leadership and ethics in the emerging field of aerospace security. Having held numerous leadership positions and being heavily involved in law enforcement accreditation, she strongly supported courses in ethics and leadership, which could prepare students to lead effectively and do the right thing even when working in the grey areas where no black or white answer exists.

Participant #7 has witnessed an increasing dependence on technology in law enforcement and recommended course work in this area for those entering into the security arena. She pointed out that due to the broad nature of aerospace security, the role of technology may even be more critical to security personnel than their law enforcement counterparts. She believed that courses in computer science and security technology would be beneficial in preparing future security professionals.

When asked how she viewed the need for intelligence in aviation security, Participant #7 stated, "…it is huge…". While providing a comprehensive education in intelligence gathering, processing, and distribution may be beyond the scope of an aviation security program, Participant #7 believed some course work in this area is needed. A basic course that informs students how the intelligence community is organized, how information is obtained, and how it is designed to flow to the end users, would allow students to more effectively receive and transmit information as needed. Timely and accurate information is essential to the risk management process.

Again, due to her involvement with international law enforcement accreditation, Participant #7 understands the need for risk management and feels that students would benefit from risk management courses. Course work in this area could provide students with the processes they need to make quick and accurate decisions. The fact that such decisions must often be made under great pressure only enforces the need for a good educational foundation that includes sound risk management principles.

Additional Contributions

Participant #7 postulated that the focus of any aerospace security program should be on communications with a strong emphasis on relationship building on both a local

and international level. She pointed to the current trend of having Israeli security personnel instructing United States security personnel on lessons they have learned as a prime example of how valuable such relationships can be. To be an effective networker, students must have communications skills, a base knowledge of how to establish networks, and a cultural awareness that allows them to relate to those with other perspectives and values.

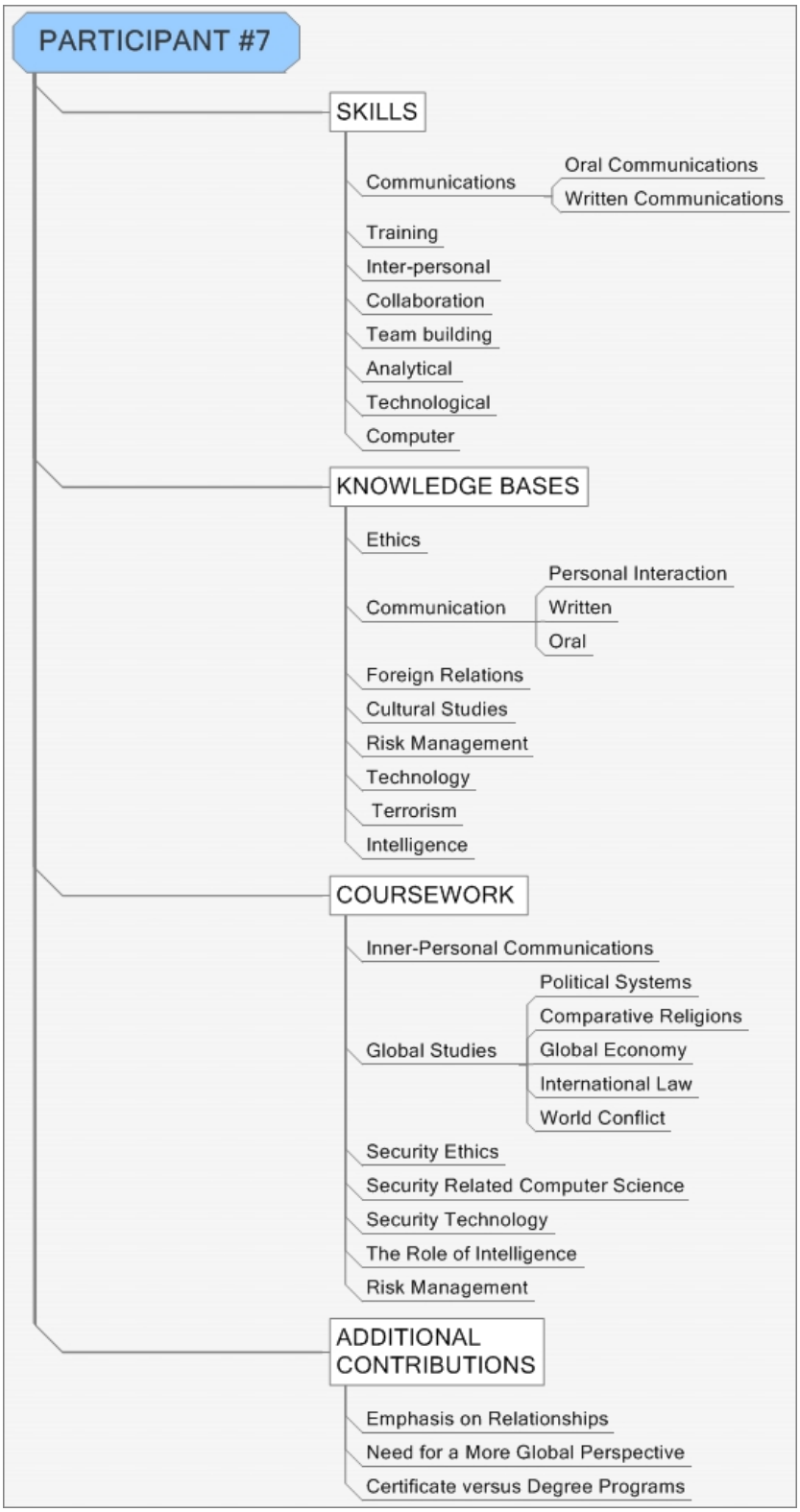

Figure 11. Participant #7 Overview

Participant #8

Participant #8 served over 30 years as a law enforcement professional. During his tenure in law enforcement, he was awarded a teaching credential and earned a Masters Degree in Safety and Systems Management. He subsequently earned a Juris Doctor degree and at the close of his law enforcement career practiced law focusing on areas involving risk management. In recent years, he has emerged as a premier speaker, in both the public and private sectors, speaking on a wide range of topics including organizational and operational risk management, civil liability, and ethical decision-making.

He excels as a trainer and has developed an effective risk management training program focusing on Solid Realistic Ongoing Verifiable Training (SROVT). He has made over 3,000 presentations world-wide and brings to this study a unique perspective on risk management and security, and how the two topics should become one. His law enforcement background, understanding of the legal system, insight into effective methods of training, all combine to provide a rich source of information for this study.

Skills

Because of his risk management background, Participant #8 believed that those skills associated with risk management such as recognition, prioritization, mobilization, and decision-making are foundational to those wishing to enter the aviation security field. The development of those and associated skills could enable students to perform the tasks necessary to insure security in a quick and efficient manner.

Participant #8 believed strongly in the theories of probabilistic thinking which deal with cause and effect relationships. Critical thinking skills needed to apply

probabilistic principles are essential for aviation security students. Course work leading to foundational knowledge in the areas of decision-making, statistics, and visioneering can lead to the development of such skills.

Participant #8 theorized that, in general, American students are woefully short in language skills. He believed that the development of language skills is extremely important to those wishing to go into aviation security. He was particularly concerned about the shortage of American security personnel fluent in Arabic and Chinese. He believed that, if a country posess a significant threat to the United States, it is important that security forces have the capability to speak and understand those languages.

Participant #8 knows the power of networking and collaboration. Skills in those areas will allow students to leverage their knowledge and become more effective problem solvers. The ability to set and achieve realistic goals is also an essential tool for security professionals at all levels.

Knowledge Bases

Participant #8 was adamant that future aviation security professionals have a sound foundational understanding of some key areas. He mentioned risk management, probabilistic thinking, cultural studies, terrorism, decision-making, and statistics. While the list is not exhaustive, it does represent many of the pillars of knowledge essential for security professionals.

Participant #8 stated that risk management is the key to effective security. He was so convinced that he recommended the name of the program reflect a strong risk management influence. He stated, "I would love to see risk management built into the name of your program. You know, 'Aviation Security, A Risk Management

Perspective." He believed that this would set the tone for the program putting everyone on notice that the program is about determining what the true risks are to the aerospace industry and finding effective ways to mitigate that risk.

Participant #8 strongly asserted that students preparing for careers in security must understand the principles of risk management and be steeped in the probabilistic approaches, constantly searching for cause and effect relationships, and finding effective ways to mitigate threats before they become life-threatening incidents. Without these two elements, any program in aerospace security or security of any type would be fatally flawed.

Participant #8 stressed the importance of knowing your enemy. Drawing on his past law enforcement experience, he recommended that students be encouraged to think like "the bad guys." He stated, "…in the area of aviation security, we have to not only think about actuarial, how we have been hit before, but if I was a terrorist, how would I be planning future events." In order to accomplish this task, there must be foundational knowledge of world cultures. In many cases, security personnel do not speak the language of potential enemies nor understand the way they think. Years after the September 11 attacks, our key enforcement and intelligence agencies are still woefully short of bilingual agents capable of fluently speaking threat languages.

He believed that cultural awareness, beginning with understanding of world religions, is critical to thinking like the enemy. At a bare minimum, students need to have a base knowledge of the five principal religions, their origins, beliefs, and tenets. This aspect of cultural awareness is essential to understanding how other people think, reason, and react.

Participant #8 believed that foundational knowledge in both domestic and international terrorism is also critical to future security professionals. Threats can and do come from many directions. He believed that education and training of security personnel must take a more holistic approach moving from simply examining what crimes occur and how they occur to "… what are the risks that we face in a given community, and how can we put control measures up front?" Students must have a clear foundational understanding of both the history and future trends of domestic and international terrorism.

Participant #8 rounded out his view of foundational knowledge by pointing out the need for students to understand the decision- making process. Security personnel are constantly called upon to make decisions, large and small; and to be successful, they must have a base knowledge of how good decisions are made. Since having and understanding pertinent information is critical to the decision-making process, Participant #8 stated that students must have an understanding of statistics and the analysis of statistics. He stated, "They must understand the value of statistics."

Recommended Course Work

Participant #8 emphasized course work that will help establish the risk management foundation essential for security personnel. He believed that an effective aerospace security curriculum must include courses in threat assessment, risk recognition, prioritization of risk, actuarial risk management, probabilistic risk management, and critical decision-making. These courses lay the risk management foundation upon which the remainder of the curricula can be established.

Courses in religion and language, enhanced by history of international relations and world geography, would provide students with a basic understanding of other cultures and provide the basic cultural awareness needed to understand world events. Situational awareness would also be enhanced by course work in practical statistics which provides students with a basic understanding of how to interpret statistics and apply statistical principles to real world situations.

Participant #8 recommended course work both in international and domestic terrorism. Those basic courses should be supplemented with courses in the history of terrorism and the psychology of terrorism to provide students with a deeper understanding of the threats faced in this multifaceted area.

Additional Contributions

Participant #8 emphasized the need for risk management as the central theme in the aerospace curricula. The need for proactive action should drive all those who would seek to keep our nation and its citizens safe. He believed that students must be encouraged to become visionary in their thinking processes, and that security personnel must become proactive by looking through the enemy's eyes and thinking as they think. Students must learn to be probabilistic thinkers, understanding cause and effect, and finding ways to interject solutions to problems that have not yet surfaced. In his words, students must become aggressive and avoid "lawyer think," which he described as the process of fixing things that have already gone bad. He believed we must develop a passion for prevention.

Participant #8 recommended that a strong continuing educational element be established where security professionals are constantly being pulled back into the

educational process. He suggested that full advantage be taken of distance learning opportunities to pull professionals back to a virtual class environment for constant exposure to the best and brightest instructors and latest developments in the field. Only by constant upgrading of personnel within the system can security education programs hope to stay ahead of those who would pose a security threat.

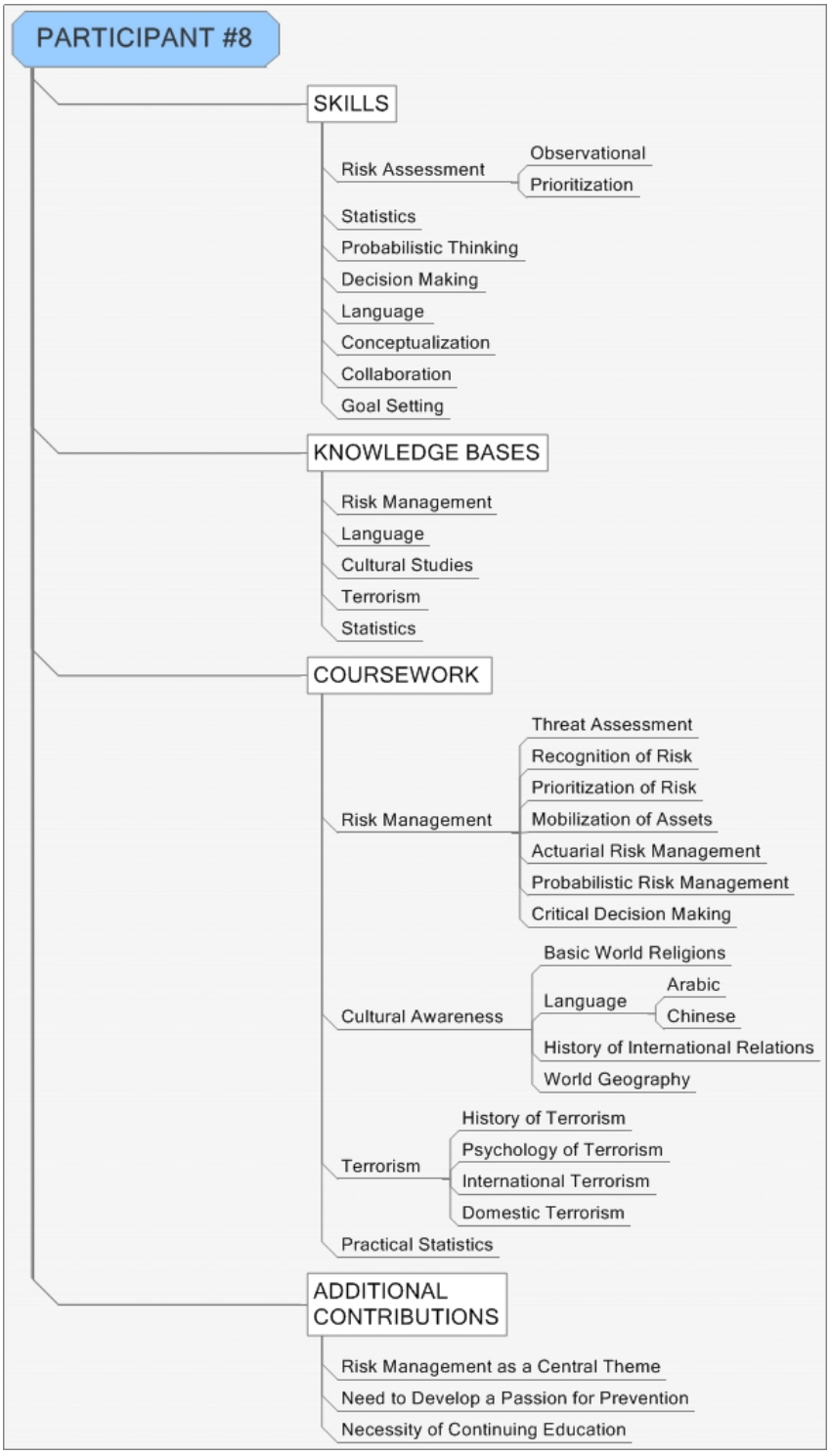

Figure 12. Participant #8 Overview

Participant #9

Participant #9 serves as a Security Intelligence and Counter Terrorism Officer at a major international airport. He has studied terrorism for over 20 years and is the publisher of a daily international open-source briefing document, with hundreds of subscribers, which deals with terrorism, international conflict, crime, and aviation matters.

Participant #9 has lectured to thousands of law enforcement, military, and aviation officials at all levels of government. He is also an explosives expert with extensive expertise in bombs, bomb-making, and threat recognition. He has extensive knowledge of terrorist financing operations, and he teaches students to recognize the difference between terrorist financing and standard money laundering. He brings to the study an international perspective based on years of aviation security experience.

Skills

Participant #9 believed that an essential element of security is the ability to work within the system. To accomplish that, students need to develop people skills and the ability to collaborate with and work with many different elements that make up modern aviation. He suggested that planning, team-building, training, communications, and analytical skills should be required skills for students who expect to succeed in the aerospace security field.

Planning is essential to the development of systems that meet the needs of specific airports and aviation programs. Planning skills permit future security managers to make the most of finite resources as well as limited human resources. Planning skills could

also aid in the development of facilities that are conducive to enhanced security, while maximizing aviation business opportunities.

Participant #9 described the modern airport as, "…a microcosm of multiple agencies and multiple jurisdictions." New aviation security personnel can find themselves overwhelmed by the complexity of the system. Collaboration and team-building skills are essential to success. Security personnel must quickly adapt to the system and learn to work closely with many different elements with varying missions and agendas.

Having worked directly in the field for well over 20 years, Participant #9 understands the financial limitation put on security personnel and reiterated the importance of sharing knowledge. Skill in making presentations and conducting training is of great value to security personnel. With limited training budgets, the ability to share information in an effective manner helps to maintain a high level of expertise within the workforce at minimal cost.

In addition, security personnel may be called upon to brief executives and provide training to non-security personnel. During emergency situations, security personnel could be called upon to make clear and concise presentations on complex data, on short notice, with limited information. These skills cannot be developed overnight and should be developed throughout any aviation security degree program.

Participant #9 understands the need for analysis and suggests that students develop analytical skills. These skills may be used to aid staff in making accurate cost-benefit analysis, in assessing threats, and determining associated risks. Whatever the venue, analytical skills would be essential to aerospace security personnel of the future.

According to Participant #9, one of the most important skills for security personnel is balance. Security personnel must understand both the security and business aspects of the industry and balance those aspects against opposing interests to provide a system that can meet the needs of both.

Knowledge Bases

Having worked in the aviation security industry for years, Participant #9 fully appreciates the need for security personnel to have a strong foundational knowledge of applicable laws, regulations, and policies. Due to the nature of the aviation industry, the knowledge base must be international in scope. Security personnel must be aware of international laws, regulations, policies, and practices since they can all have a direct impact on local systems and operations.

Continuing with the international theme, Participant #9 also believed that security personnel must have a base understanding of international aviation security. The knowledge of systems, procedures, and techniques used in other countries around the world can contribute greatly to the ability of students to plan and implement successful security measures in their local jurisdictions. That knowledge, coupled with and tempered by knowledge of international laws and policies, could aid students in the development of effective security systems.

Participant #9 believed a basic understanding of the business aspects of aviation is absolutely essential for those entering the security field. He expressed his concerns about new security personnel by saying, "…they are not used to the business perspective, and the airlines are on that huge fine line where they are trained to operate a business…" . Security personnel must understand the business aspects in order to develop reasonable

security programs and systems that can meet security goals, while allowing business to operate.

Participant #9 has experienced firsthand the conflicts that arise between security personnel who do not have a basic understanding of business needs, and he strongly encourages the development of the business knowledge base. He believed that students must understand aviation management, cost-benefit analysis, marketing, and similar topics if they are to be effective as the security managers of the future.

Participant #9 understands that threats to the aerospace industry come from many venues. Criminal activity, the mentally unstable, and disruptive passengers all pose threats that must be addressed by security personnel; but in the post 9/11 world, terrorism looms heavy on the horizon. Security personnel must have a base knowledge of world history in general, and the history of terrorism, in particular. They must understand the diverse political systems around the world and how those systems contribute to or inhibit the spread of terrorist activities.

He believed that students should also have a basic understanding of the psychological and sociological implications of terrorism and terrorist activities. Such knowledge could broaden the base of understanding and allow future security personnel to understand their adversaries more completely and to plan more effectively to defeat their efforts.

Participant #9 believed that security personnel must have a basic understanding of law enforcement practices and procedures. He also believed that effective security should be focused on prevention. To that end, he suggested that students develop crime

prevention knowledge bases that would encourage security personnel to be more proactive.

His experience in the field of law enforcement and aviation security has reinforced his belief in information sharing. He believed students should have a basic understanding of intelligence, especially concerning open sources and how they can be utilized to glean information for security purposes. He commented that the United States Central Intelligence Agency has people who do nothing but search open sources. Security students need to understand the value of such information and learn how to quickly and efficiently mine that data.

Recommended Course Work

To develop skills and establish the recommended knowledge bases, Participant #9 recommended course work in the areas of aviation law, business, history, communications, terrorism, analysis, criminal investigation, intelligence, and crime preventions. The course work listed in this section is not all inclusive; but if arranged and taught effectively, could establish the basis of an effective aviation security program.

The topic of aviation law is sufficiently broad to cover several related areas. Participant #9 believed that students should have courses in international aviation law which would necessitate the examination of several major treaties and international agreements. He also recommended course work on aviation regulations, especially as they pertain to the handling and transportation of dangerous materials. An entire course could be designed around United States Federal Air Regulations. Participant #9 concluded that course work on laws and security regulations are core topics to which all students should be exposed.

Participant #9 was equally adamant that business courses such as cost-benefit analysis, aviation management, and aviation economics be included to provide students with a respect for the business concerns of aviation. He stated that security students, "…have an understanding of the airline industry from a business perspective…"; they must understand "…how business functions." A Business Administration 101 type course could provide that understanding.

Participant #9 stated that he was not particularly fond of history and political science courses when in school, but he considered them critical for aviation security personnel working in a global environment. Courses in world history and international political systems would contribute to the aerospace security student's situational awareness and give them a much clearer perspective on world events.

Participant #9 made the point that security is rarely a high priority for funding. That being the case, security personnel need to be able to share their knowledge with colleagues. He believed that the development of communications skills should be a key part of the curricula and that students should have course work on methods of instruction that would prepare them for their dual role of security personnel/instructor. Participant #9 believed that the ability to make effective presentations is going to become even more important in the future. In his words, "We are going to see less and less money available to afford staff training … and it is going to be security that people run to for knowledge…" .

Participant #9 believed that courses in terrorism are fundamental. The history of international terrorism linked to courses in aviation terrorism can provide the student with the basic knowledge. He believed that courses in the psychological and sociological

aspects of terrorism would be needed to round out the student's knowledge in the area. The study of terrorism must be an ongoing process; new risks and threats are constantly emerging.

Participant #9 recommended course work in analysis both from a theoretical and practical perspective. He believed that students should have courses in cost-benefit analysis to help understand the business aspect previously mentioned, but he also believed that students should be exposed to course work that emphasizes practical exercises. In his opinion, the best way to learn to analyze a criminal case is by working a "cold case" where analytical skills are given a practical application.

He also believed that all potential security personnel should have a basic course in criminal investigation so they understand from a law enforcement perspective what is needed to make a case. At the same time, he emphasized the need to focus on prevention. Participant #9 believed that course work in crime prevention, coupled with the role and use of open source information, would be very beneficial to those entering the aerospace security field.

Additional Contributions

The most significant additional contribution that Participant #9 brought to the study was his practical approach to aviation security based on years of experience in the field. From his perspective, to be effective upon entering the field, students must be: team players, good communicators, able to play on a world stage, and business minded. These attributes, however attained, are essential.

He believed that course work, especially at the certificate level, must be available on-line. Those already active in security, and aviation management, usually have very

busy schedules and little time to attend classes in a conventional setting. Participant #9 encouraged continuing education thus allowing both students and practitioners the ability to constantly update their knowledge on new trends and techniques.

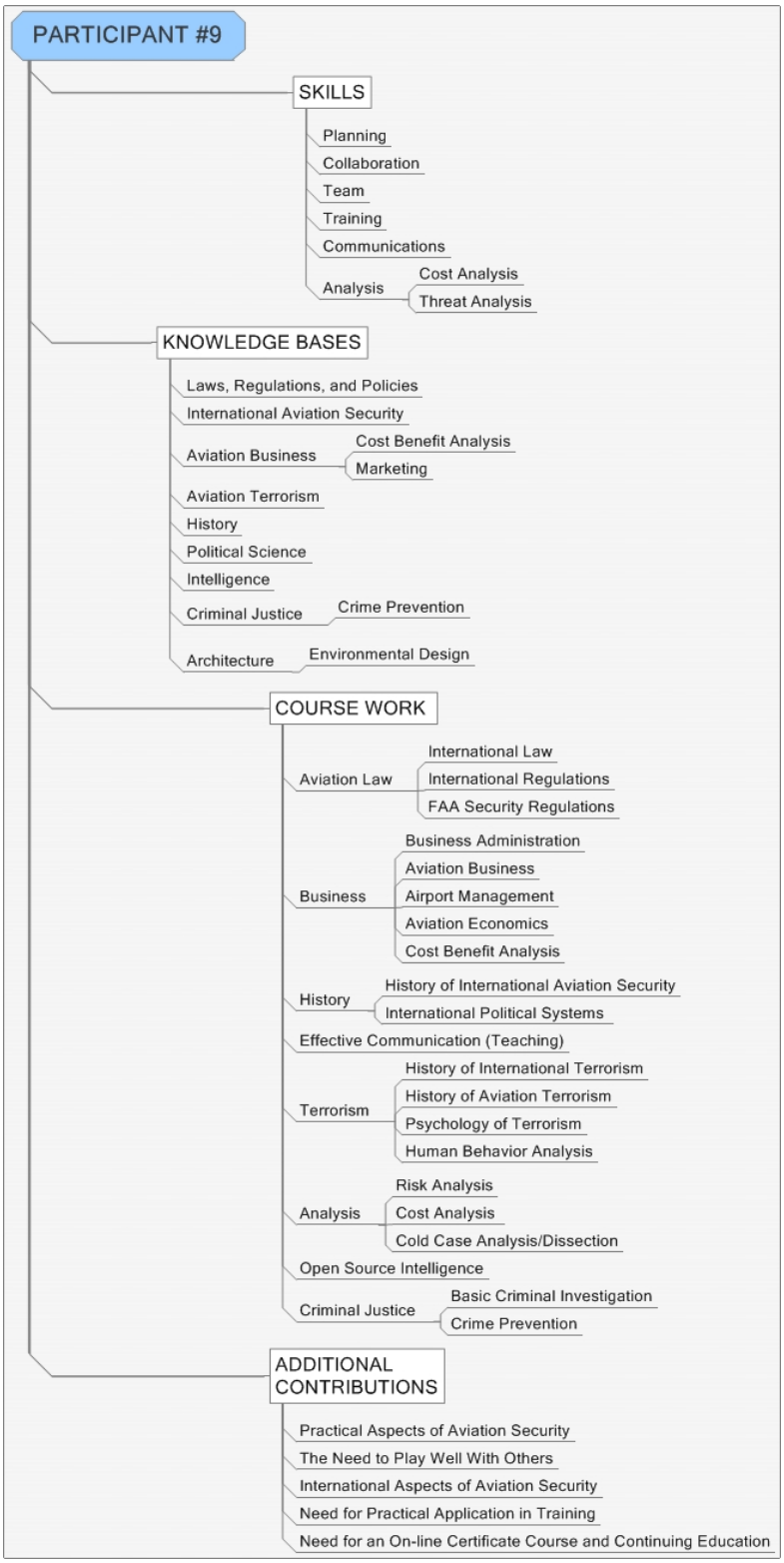

Figure 13. Participant #9 Overview

Participant #10

Participant #10 brings over 30 years of general aviation experience to this study. He has owned and operated one of the top ten flight operations businesses in the United States and currently is the President of an aviation security firm focusing on meeting the needs of general aviation concerns nationwide. He has conducted extensive research in the area of aviation security, specifically in the field of general aviation. He served on local, state, and national committees, as well as commissions on aviation security, and has been published in several aviation journals on a variety of topics. His unique combination of aviation business experience and security expertise makes him a rich source of pertinent information.

Skills

Participant #10 believed that students seeking to be future aviation security personnel should seek to develop business, people, analytical, and planning skills. These four primary areas include many subordinate skills such as effective communications, critical thinking, and decision-making.

Coming from a business background, Participant #10 knows firsthand the importance of business skills and believed that students who possess aviation management skills would be better equipped to understand how to effectively and efficiently incorporate security measures into the overall operation. The skills that insure success as an airport manager will be needed by security personnel.

To effectively deal with a wide variety of entities that come together to form a modern flight center, Participant #10 believed people skills are essential. Students must develop the ability to work with, and coordinate the efforts of many different groups, all

of whom may have differing agendas. Participant #10 stressed that security solutions often must include input from customers, tenants, and vendors, as well as airport management. Those seeking to develop security solutions must be able to work with all those groups to establish a balanced program that provides a secure environment in which the business can flourish.

To develop such programs, students must have analytical skills that enable them to quickly and efficiently assess data and develop solutions based on their analysis. Students must develop the ability to examine a huge volume of information coming from a wide variety of sources and technologies and develop effective solutions quickly. Participant #10 believed that students would have a significant advantage if they make accurate assessment of the data using their analytical skills, then combine those assessments with input gained through the application of people skills.

Participant #10 deals with general aviation concerns nationally and understands the need for effective planning. To be effective, students must develop planning skills that insure they have the ability to understand all aspects of security including the ripple effects of security measures. Participant #10 used the example of lighting to illustrate the need for attention to detail in planning. He stated that pole barn lighting might give general illumination to an area; but to be effective, the planner needs to view the area at night and determine how to provide lighting in specific high priority areas. That attention to detail can make the difference between an effective lighting system and one that simply "…draws bugs…".

Knowledge Bases

Participant #10 believed that a foundational knowledge should begin with a clear understanding of the aviation industry in general, followed by established knowledge bases on the specific segments of the industry. Participant #10 has spent more than 30 years in the general aviation field and believes that future security personnel must have a clear understanding of this very significant portion of the industry. According to Participant #10 there are very few security professionals, at any level, who understand general aviation.

Once students understand the industry, Participant #10 suggested they should establish foundational knowledge in the various elements that make up security as a whole. Knowledge bases must be established, at a minimum, in the areas of physical security, security technology, personnel security, security assessments, and security planning.

Participant #10 emphasized the fluid and ever changing nature of all elements of security but stated that security technology is especially susceptible to rapid change. This may require students and faculty alike to be constantly vigilant for new innovations and applications of technology to security problems. This is a knowledge base that is in constant flux and must be continually monitored.

Participant #10 stated, "….you assess risk to know what the security environment is." A foundational understanding of risk assessment is essential to all security personnel. To adequately and effectively complete risk assessments, Participant #10 suggested students must have a basic knowledge of analysis and how to design systems based on that analysis.

Recommended Course Work

Participant #10 recommended courses in aviation, security, airport design, and airport operations. These broad categories of course work encompass several additional related courses. To establish skills and provide basic knowledge, Participant #10 believed the curricula must begin with basic courses on the aviation industry.

Once that basic knowledge has been established, follow-on courses covering general aviation, aviation management, and airport operations could be used to round out the student's basic aviation knowledge. With that knowledge established, Participant #10 believed that course work on the various aspects of security should be considered.

Participant #10 suggested aviation security course work should include physical security to include lighting, security system development, and trends in security technology. He emphasized, that due to the multi-faceted nature of general aviation, there are many challenges to security that may not be present in other aviation facilities.

In order to meet those additional challenges, Participant #10 believed that a course in general aviation airport operations would be of great assistance to future security personnel. Without such course work, students may not understand the challenges they face at smaller airports nor be able to develop realistic security plans for those facilities.

Many security issues can be avoided through good initial design. With the number of aviation facilities that will be upgraded in the next few years, students need to understand how basic design and security principles can be merged. Participant #10 knows the importance of airport design as it pertains to security and suggested that a course in the security aspects of airport design be included in the curricula.

Additional Contributions

Participant #10 had several noteworthy ideas on a wide range of relevant topics including the need for on-line programs, the demand for different levels of degrees, the importance of speed and flexibility in program design and implementation, the potential demand for security programs, marketing approaches for aviation security programs, and funding issues faced by general aviation practitioners. His years of experience as an executive in both fields add credibility to his suggestions.

Participant #10 believed that certificate courses, if properly marketed, would be extremely popular. Many supervisors, managers, executives, and even aviation customers, acknowledge the need to be more informed on security matters and would be very interested in a certificate course to enhance their understanding and build their resumes. Participant #10 believed the key to a successful program is to develop meaningful curricula that can be fully presented in an on-line format catering to the needs of non-conventional students. He suggested that there are many aviation-related associations whose members are looking for aviation security educational opportunities. There are numerous aviation associations with thousands of members who can be reached through the association web sites.

Participant #10 believed the demand for aviation security degrees exists at every level from bachelors through doctorate. He pointed out that those wishing to enter the security field at the state and federal levels would be interested in bachelor level programs and there may well be some cross over interest from those in the law enforcement profession. He believed that masters programs would appeal to those

currently in the profession who are wishing to advance to the executive level, and that the doctoral program would appeal to those seeking executive positions in the state or federal systems. In summary, Participant #10 was convinced that there is sufficient market share available to support aviation degree programs at all levels, if those programs are properly marketed.

Participant #10 strongly believed that aviation degree programs must be flexible, constantly upgraded, and highly adaptable to both conventional and non-conventional students. If programs meet those criteria, they can be very effectively marketed through the various aviation groups and associations, possibly with the support of state and federal aviation agencies with an interest in security. He concluded that funding through state and federal agencies would be a possibility to aid general aviation concerns in attaining certification and possibly even degrees.

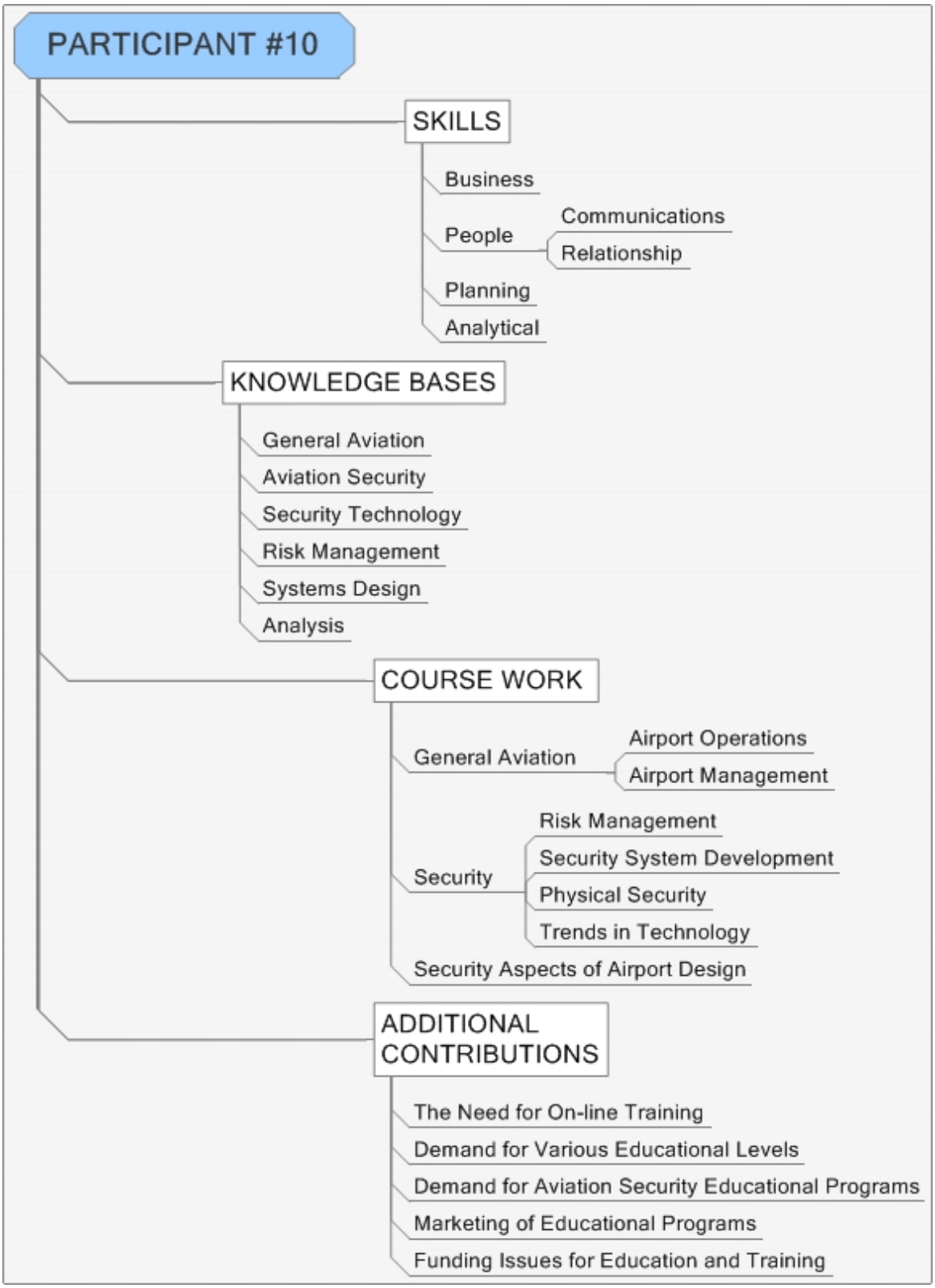

Figure 14. Participant #10 Overview

Participant #11

Participant #11 has over 30 years of experience in the field of aviation including several years of experience as airport manager of a small to midsize general aviation airport. He holds a position with a state aeronautics commission which has afforded him the opportunity to personally examine hundreds of small airport operations and he has reviewed dozens of their security plans. He is familiar with state and federal regulations concerning safety and security and brings to the study a small airport perspective on security.

Participant #11 did not specifically address skills in his interview and mentioned only a few foundational knowledge bases that he believed should be established along with the corresponding course work. Although this participant did not go into academic requirements in depth, he did provide valuable insight into the urgency of maintaining security at our smallest, most numerous, and arguably, most vulnerable aviation sites. As such, this interview was included in the study. It is essential that the needs of all segments of the aerospace industry be considered in any well-rounded discussion of security, particularly those related to airports and/or the potential use of small aircraft for terrorist activity.

Skills

Participant #11 did not address specific skills during his interview. There were several implied skill sets such as management skills, people skills, and design skills that should be developed concurrently with the knowledge bases mentioned.

Knowledge Bases

Participant #11 believed that base knowledge in the areas of general aviation, small airport operations, applicable regulations, and airport design should be established. Participant # 11 stated that security personnel need a basic understanding of general aviation and how small airports function. This knowledge coupled with a clear understanding of state and federal regulations concerning the operations, safety, and security of small airports would assist students in understanding the unique challenges faced by small airports and their managers.

Participant #11 has personally visited hundreds of small airports and understands the need for effective airport design. While most small airports do not have the funding needed for extensive renovation, knowledge of effective design is an important tool for future security personnel to possess. Participant #11 believed that many security issues could be avoided through proper planning and design.

Recommended Course Work

Participant #11 believed that courses in physical security, proper use of available technology, basic airport design, and risk assessment would be appropriate for future security personnel. Based on his experience, Participant #11 understands the need for physical security and believed that students should be aware of the impact on such simple measures as perimeter fencing and signage. He believed that students should understand and take advantage of security technology, but they must also understand that financial and other limitations do not always allow small aviation concerns to implement the best solution.

Participant #11 believed that many people currently involved with small airports, including City Managers and other public officials "…have no clue what they are supposed to have on an airport as far as safety and security are concerned." He suggested that students should be exposed to course work that would provide them with a clear understanding of safety and security regulations. This course work could aid them in their daily work and provide them with the skills to educate others.

Participant #11 pointed out that every airport is different and each has its own unique set of challenges and needs. Students seeking careers in security should be exposed to course work that can prepare them to make accurate risk and needs assessments.

Additional Contributions

Participant #11 focused on the fact that a huge segment of the aviation community has been basically overlooked in the rush to provide higher levels of security to commercial aviation. He pointed out that most small airports have little security, limited resources, and a great deal of exposure. He believed that even those few small airports that have viable security plans stand little chance of actually being able to fully implement those plans.

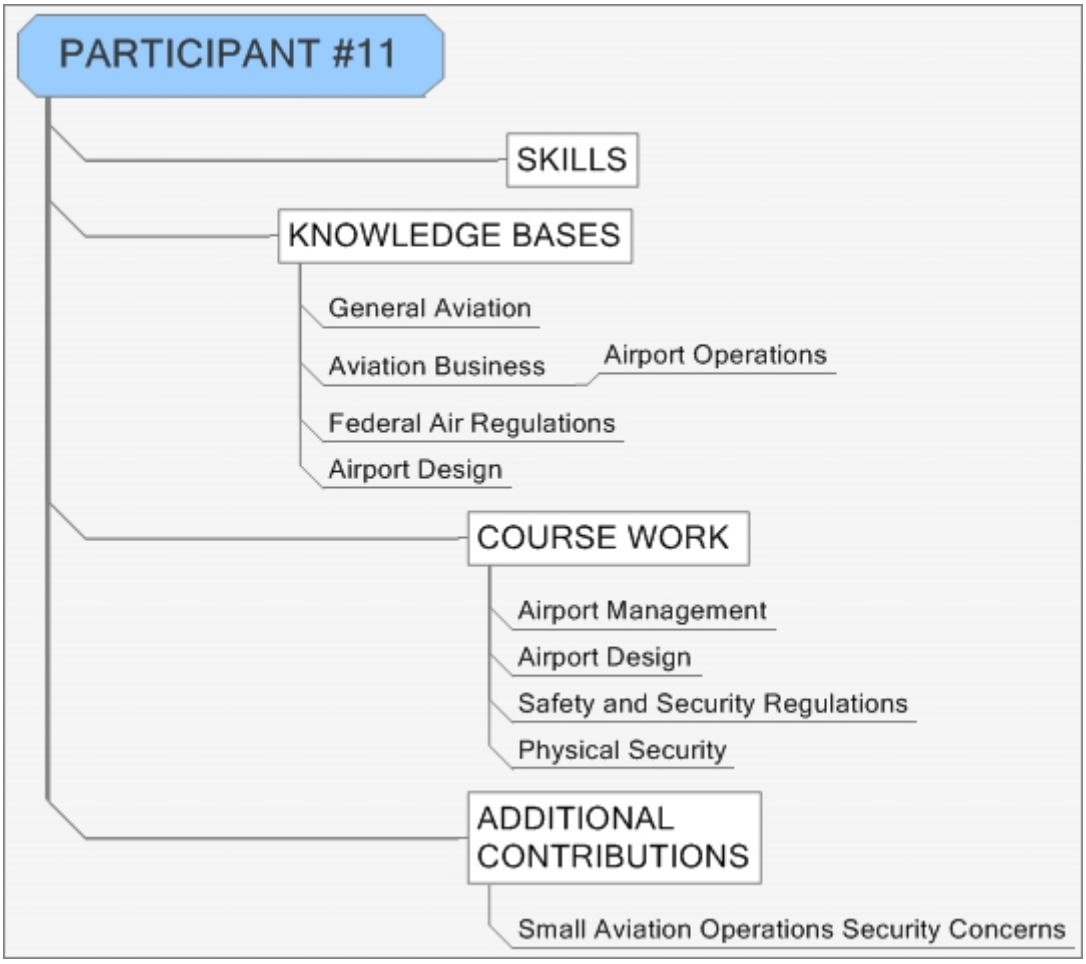

Figure15. Participant #11 Overview

Participant #12

Participant #12 holds a Bachelor of Science degree in Criminal Justice and has spent over 20 years in law enforcement both as a civilian, and in the military. His military experience has included commanding aviation security forces in the United States and in Iraq. Having served in both a peace time environment and a combat zone, Participant #12 has an appreciation for all the elements that make up an effective aviation security system. Participant #12 is currently commanding security forces at a major United States Air Force installation and brings an added military dimension to the study.

Skills

The skills that Participant #12 believed to be essential fall into the two broad categories of people skills and technical skills with several significant sub-sets. People skills include leadership, relationship building, teaching, and interpersonal communications. While these skills are inter-related, each requires focus, development, and practical application to be effective.

In the area of people skills, Participant #12 listed leadership as the most critical. He suggested that leadership skills are primary to the successful completion of any security mission. Without effective leadership, even the most routine security tasks, such as mounting a guard post, can prove ineffective. Leadership includes the ability to build and manage strong relationships with both subordinates and superiors and the ability to de-escalate tense situations.

Participant #12 believed that interpersonal communications skills are also paramount to security personnel. The ability to quickly and effectively communicate, both orally and in writing, is essential for security personnel who are routinely called

upon to brief each other and superiors on rapidly changing security situations. Good communications skills provide security personnel with the ability to give decision-makers the information needed in a clear, concise manner facilitating their ability to make the right decisions in a timely manner.

Participant #12 also believed that communications skills significantly contribute to the ability of security personnel to train others. Security personnel are called upon to train each other, brief leaders, and educate the public. Communications skills allow them to accomplish that mission.

In the area of technical skills, Participant #12 believed that basic law enforcement skills are important for all security personnel. Tactical skills in firearms, arrest procedures, interviewing, and interrogation could aid future security personnel in the completion of their assignments.

The ability to apply the various forms of security technology is also important to those entering the security field. Participant #12 viewed technology as a force multiplier designed to provide additional protection to assets, but this can only be accomplished by personnel who have the necessary skills to implement the technology in the most effective manner. To make the most effective use of both human and technological resources, future security personnel should possess exceptional planning skills.

Knowledge Bases

Participant #12 believed aviation security to be a very broad-based endeavor requiring many categories of knowledge including: leadership, security, technology, risk management, law enforcement, cultural studies, interpersonal communications, system design, and statistical analysis. Each of these areas of foundational knowledge has sub-

divisions which may require emphasis depending on the particular security environment in which the student works. Regardless of the security specialty, some base knowledge is needed in all the mentioned areas.

Participant #12 firmly believed that leadership is a prerequisite to effective security. A foundational understanding of both the practical and theoretical aspects of leadership should be considered an essential part of any security curricula. Participant #12 considered ethical standards to be an inseparable part of leadership, and as such, should be included in leadership training.

Under the broad heading of security, Participant #12 believed several specific knowledge bases should be established, beginning with a basic understanding of law enforcement. He recommended that security personnel be capable of understanding the laws pertaining to security and law enforcement procedures, including basic investigative techniques. This knowledge would aid security personnel in the completion of their duties and make them more effective in assisting enforcement personnel with their investigative and apprehension duties.

Participant #12 used the military terminology of operational risk management to refer to standard risk management procedures. He believed that security personnel must be well versed in the principles of risk management which includes the need to establish a knowledge base in the areas of decision making and analysis. To make effective decisions based on their analysis, security professionals need to understand the technologies available and how to design flexible systems to maximize all available resources.

Participant #12 believed that interpersonal communications is an irreplaceable element in the persona of an effective security professional. Every person seeking entry to this field should have a clear understanding of how to communicate effectively with peers, other segments of the industry, and with those outside the industry. Having served on foreign soil, Participant #12 also believed that future security personnel must have foundational knowledge in world cultures. Failure to attain such knowledge puts students at a severe disadvantage when working in a global environment.

Recommended Course Work

Participant #12 recommended course work in three broad categories of leadership, security, and cultural studies. He believed that course work in these and the supporting courses would establish knowledge bases and start the development of skill sets needed for students to be successful in the security field.

Participant #12 believed that leadership can be taught and that such courses are essential for security personnel. The ability of a leader to take charge, calm, or de-escalate emotional situations is critical for security personnel who are often first on the scene in stressful situations. In addition, Participant #12 pointed out the need for leaders to be able to recognize the capacity for learning in other people and be able to take advantage of their abilities. Course work in interpersonal relationships, specifically focusing on communications, and the ability to establish and maintain relationships, could be an effective supplement to basic leadership training.

Participant #12 has seen the result of learning by trial and error about other cultures. Inability of security personnel to understand the customs and mores of a country in which they are working can cause major misunderstanding, leading to critical

situations. Participant #12 believed course work in world cultures and international relations would provide students with at least a basic understanding of the importance of cultural studies and lay a basic foundation upon which they can build.

The major area of concern in an aviation security program is security; and, Participant #12 believed that course work in this area should begin with a basic course in law enforcement procedures specifically covering investigative procedures. A closely related course in aviation security regulations could provide students with a basic understanding of laws, regulations, and policies currently in place that have an effect on aviation security.

Participant #12 believed that course work in what the military called anti-terror force protection would be a meaningful addition. Terrorism courses should provide a basic understanding of terrorist motivation and methods of operation along with a historical perspective of terrorist activities. Additional courses could be provided as needed on specific threat groups or trends.

Course work in risk management should include threat assessment, analysis, and security planning. In addition, security personnel need a basic understanding of statistical principles and how statistics can aid in effective security planning and the development of effective systems. Participant #12 offered that the ability to design security systems based on sound risk management principles is essential and that course work in security design should be incorporated in the curricula.

Having used intelligence information first hand, Participant #12 understood the need for students to be well-versed in how intelligence is received, processed, and distributed. A general course on the role of intelligence would provide students with the

basic understanding they need to use information more effectively and the understanding of how to forward pertinent information to the right sources.

Additional Contributions

Participant #12 was able to differentiate between a peace time security environment and the security environment in a combat zone. In a combat security environment, there is never enough time to prepare, enough personnel to cover the assets, enough technology to leverage the manpower, nor enough intelligence to allow for adequate planning.

Unfortunately, that is often the same circumstance security personnel face in non-combat areas. However, students in security programs must understand that the lack of resources does not imply a lack of responsibility. Programs must instill a sense of urgency in students and encourage the ability to apply creative solutions to difficult problems.

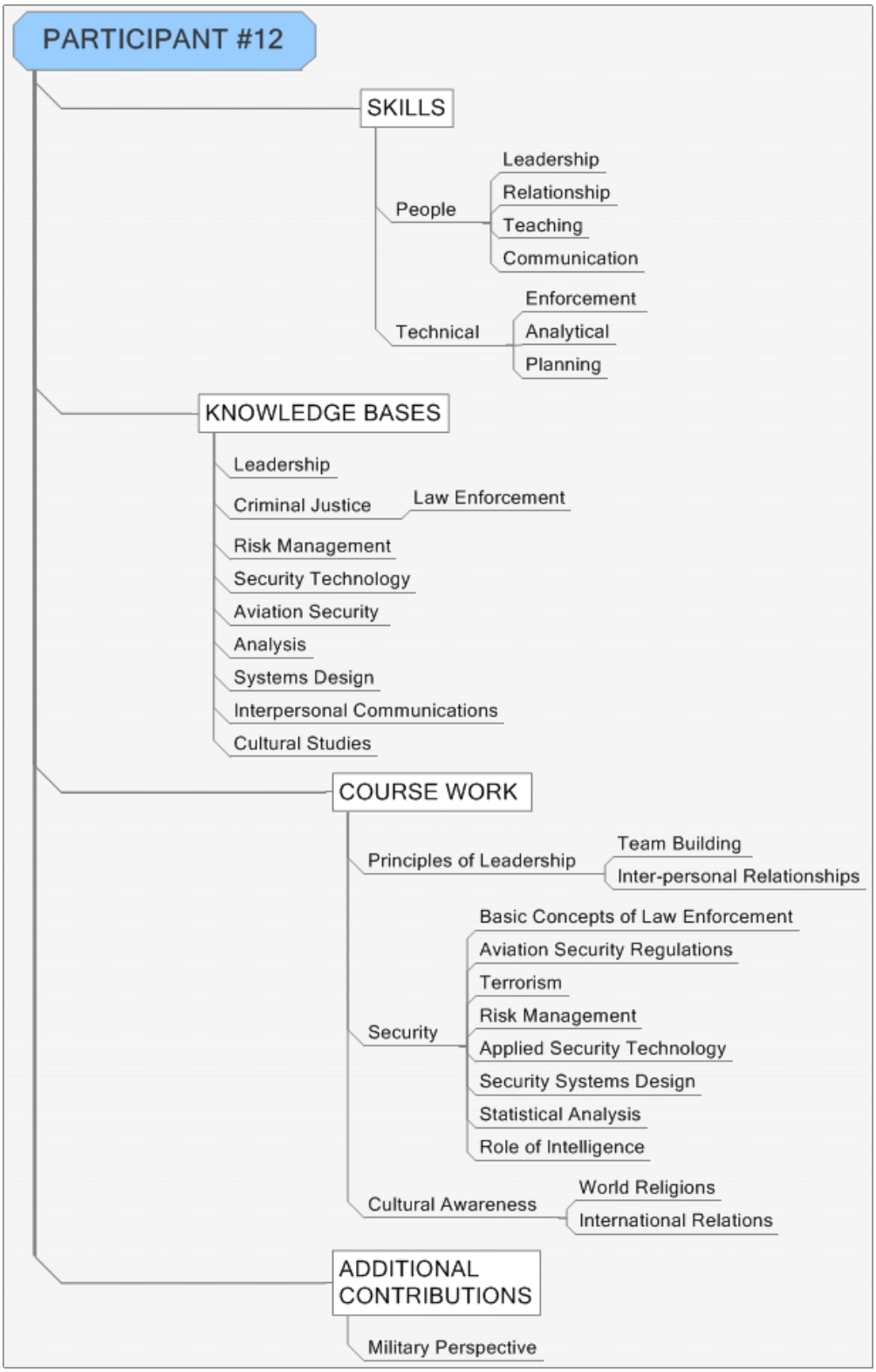

Figure16. Participant #12 Overview

Participant #13

Participant #13 has over 30 years of experience in the aviation field and has been recognized for his outstanding contributions to the field of aviation. He spent 25 years in the United States Air Force as a pilot and instructor pilot flying a variety of missions worldwide. During his last few years in the military, he was charged with establishing airport operations around the globe.

Upon retirement from the military, Participant #13 returned to civil aviation where he accepted a position managing some of the busiest commercial service airports in the country. He is currently managing a major airport in the Midwest and continues to contribute to the field of aviation. He is highly experienced in security matters having established airport operations in some of the most hostile environments around the globe.

Skills

Participant #13 believed that management skills are important for those entering the aviation security field. The ability to write well, communicate orally, and above all, think analytically are essential. As a Chief Executive Officer interviewing potential employees, and as an adjunct instructor in the field of aviation, Participant #13 recognized the need for these basic skills.

Knowledge Bases

Participant #13 believed that basic knowledge about the aviation industry is a foundational knowledge base that is essential for personnel going into aviation security. He pointed out that the industry is very complex, with the various types of aviation, commercial, corporate, and general aviation, all being very different enterprises with a common root. Students need to have a clear understanding of the industry as a whole as

well as the unique security requirements of each sector as it relates to their particular agenda.

Having worked in both commercial and general aviation, Participant #13 understands the need for security but realized that businesses cannot be so tightly controlled that they are unable to operate. He stated, "I need somebody who understands risk, is going to protect me from that risk, but also understands the importance of being able to do business." He believed that a foundational knowledge of the business aspects of aviation is critical for security personnel, and that students must understand the balance between security and business needs.

To achieve the balance between business and security, Participant #13 believed students must have a basic understanding of threat recognition and risk analysis. Security personnel, armed with both business and security backgrounds and the ability to recognize and assess risk, would be equipped to develop security plans and implement security measures capable of meeting the requirements of both business and security.

Participant #13 has experienced the value of intelligence information and believed that students should have a basic understanding of the role intelligence plays in aviation security. He stated that students need, "…an understanding of what our capabilities are; who the agencies are; and how they work together, or do not work together." This basic understanding would aid students in their risk assessment and planning processes.

Participant #13 also believed that students must have a basic understanding of applicable laws, regulations, and policies. That knowledge would allow them to make proper decisions and aid in the avoidance of lawsuits based on inappropriate actions.

Recommended Course Work

Participant #13 emphasized the need for balancing the security and business concerns of aviation and believed that course work should be designed to enhance the understanding of these two sometimes opposing interests. He recommended course work in the two broad categories of aviation and security.

Beginning with aviation, Participant #13 suggested that a course that provides a broad overview of the entire aviation industry should be required. Building on that knowledge, he recommended that students be exposed to the business aspects of aviation, including aviation economics, which would provide them with insight into how aviation businesses function and remain solvent.

He strongly believed that students should have an understanding of the business/security relationship and how it interfaces with each segment of the industry. He suggested that classes on those relationships, by sector, would provide students with a deeper understanding and prepare them to deal with real world challenges.

In the area of security, Participant #13 advocated that general security courses should be supplemented with courses that discuss the role of technology in security. He also proposed that course work dealing with the laws and regulations that govern aviation security concerns should be included in the basic curricula. These classes should cover both the criminal and civil aspects of aviation security.

Having worked in the international aviation community, Participant #13 believed that understanding other cultures could be an indispensable aid to students trying to assess threats and develop security measures to mitigate those threats. He also

recommended that students understand how the intelligence system works and what they can expect from that system.

He pointed out that the system works very differently depending on the aviation sector. Students need to understand that facilities with commercial airlines are often treated very differently from general aviation concerns and students should be prepared to deal with those voids or shortages of information. Course work that explains how the intelligence community is structured, and the role of those agencies as it relates to aviation, would be of value to future security personnel.

Additional Contributions

Participant #13 believed that both certificate and degree programs in aviation security are feasible. He expressed concern about the major differences in the security challenges and security requirements of the various sectors within the aviation community. He suggested that an education track be implemented where certificates or degree minors could be offered in specific areas such as commercial aviation security, general aviation security, or airlines aviation security.

Participant #13 also pointed out, as others have in the study, that general aviation has received relatively little attention in the wake of the September 11 attacks. Even though there has been a lack of emphasis in addressing general aviation needs, this sector remains, "…under the microscope…". University programs can help meet the needs of the general aviation sector by educating students about the unique challenges facing this major segment of the aviation industry.

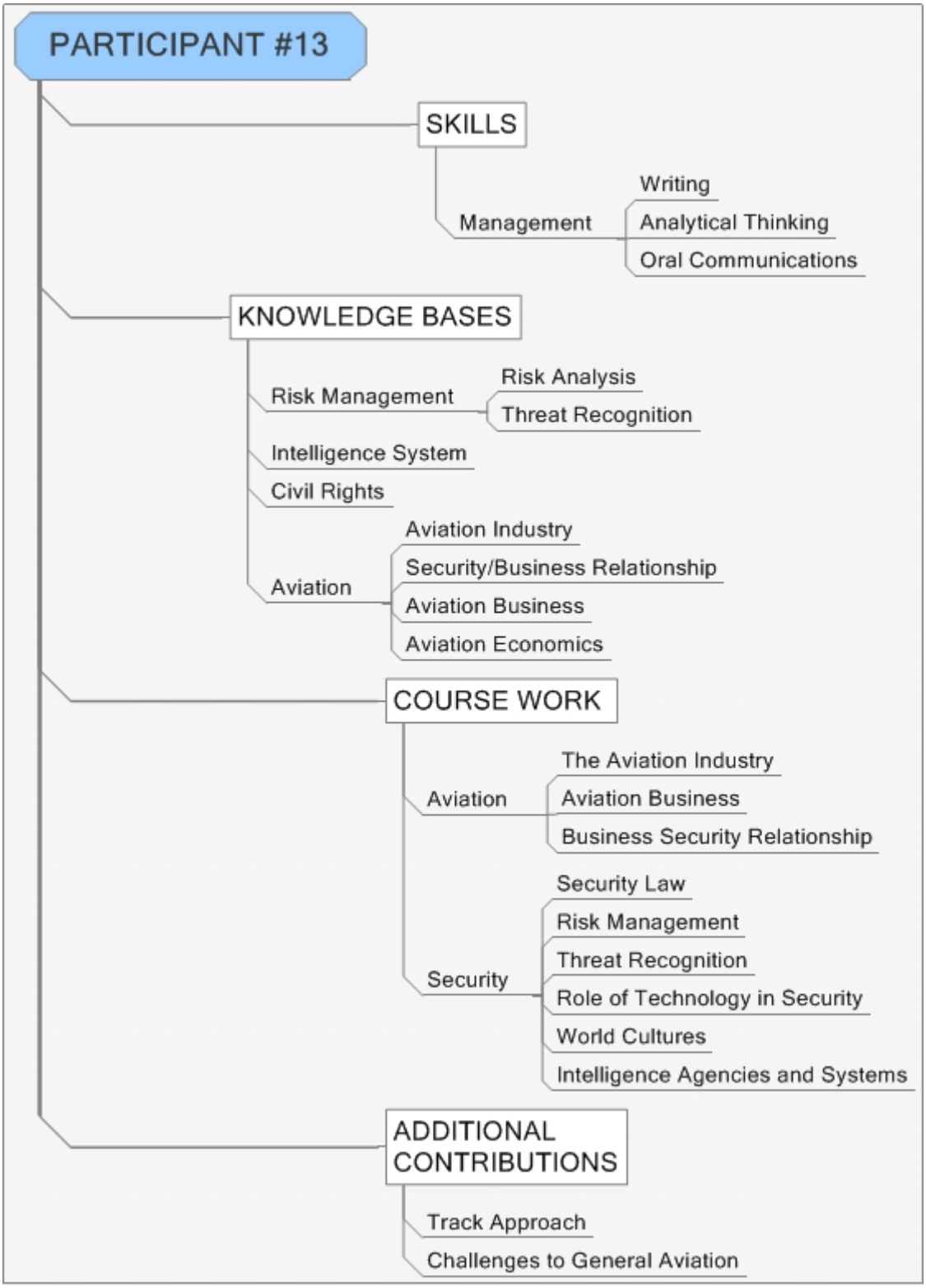

Figure 17. Participant #13 Overview

Participant #14

Participant #14 is an internationally recognized expert in field of human factors and pilot performance. He has authored five books on pilot performance and has numerous awards to his credit in the fields of research and program management. Participant #14 holds a Masters Degree in Public Administration and Military History, as well as a Doctor of Education in Higher Education. He is a retired Air Force command pilot and former Professor and Director of Military History at a major United States university.

He is currently the President and Chief Executive Officer of his own consulting company with a staff of experts who consult internationally on a wide variety of topics. He brings to the study a wealth of knowledge in aviation and aviation-related topics and a deep understanding of the practical aspects of designing an educational program.

Skills

Participant #14 spent little time discussing the area of skills. However, he did specifically mention the need for communications skills, especially the ability to deliver bad news quickly. He described this skill set as essential, particularly in large organizations, where there is a need for information to move quickly and accurately in all directions. Individuals with the ability to effectively communicate would have significant operational advantage in the aviation security field.

Knowledge Bases

Participant #14 has conducted extensive research in the area of human error and recognized that a very high percentage of unfavorable actions occurring in any field could be avoided through the use of an effective error management program. He

suggested that an understanding of error management principles would be beneficial to aviation security as well.

Understanding the psychological and physiological causes of errors, linked with a basic understanding of the ethical and compliance elements of professional discipline, is important. He believed that knowing what is right and having the courage to do what is right, even in the face of great opposition, has direct relevance to the field of aviation security. Foundational knowledge of these principles would equip students with the necessary knowledge to guide them through difficult decision-making processes that often occur in fast moving security situations.

Participant #14 believed that fundamental knowledge in the area of communications is a major prerequisite for security professionals. Not only do they need to be able to clearly and concisely communicate with each other; they must be able to propel information throughout the organization quickly and effectively. He also suggested that knowledge pertaining to media relations is important to future security personnel. Security professionals need to deal with the media to educate the public, aid in meeting security challenges, and inform the public in the wake of any serious security incident.

According to Participant #14, students should understand threat assessment that not only applies to external threats but also includes internal threats. Base knowledge in threat assessment is essential to security personnel. Future security professionals must understand that internal threats such as threats to profits, threats to customer satisfaction, and threats to the economic well being of a company, can be as critical as the external threats of criminal activity or terrorism.

Threat assessment also requires a basic understanding of technology and the relationship between technology and human resources. Students must understand how to use technology but not be used by it. Along with threat assessment is the planning element of risk management. An effective understanding of planning is critical since the ultimate goal of assessment is action, and a plan is the roadmap for that action. Foundational knowledge in threat assessment, planning, and risk knowledge is indispensable for students entering into the field of security.

Participant #14 believed that base knowledge concerning the intelligence system is important for students but emphasized the need for students to understand the need to be suppliers of information as well as consumers. He stated, "…from a professional aviation security standpoint, they have to be a source point of information; they have to know how to feed the intelligence cycle as well as how to be fed by it."

The aviation industry is a complex body comprised of multi-layered systems. Participant #14 believed that security personnel should have foundational knowledge in both systems design and integration. It is not sufficient to create an effective system alone. That system must be capable of interfacing with all the other systems within the industry and the security community.

Participant #14 works in the world-wide environment and is fully aware of the need to understand other cultures. However, he cautioned that cultural awareness classes for security personnel must be conducted with close adherence to the objective of increasing the student's cultural awareness. He pointed out that many cultural development workshops or classes tend to gravitate to one viewpoint and lose their objectivity.

Participant #14 believed that expertise from other departments, such as psychology, could aid in the development of foundational knowledge. Industrial psychology could provide base knowledge in interface issues and situational awareness. Base knowledge in the field of behavioral sciences would also be of great benefit to security personnel.

Security of aviation facilities could be enhanced by including input from those in the field of architecture. Few modern aviation facilities built prior to September 11, 2001, were built with security in mind. They were constructed primarily from a customer service standpoint. University architecture departments could be a valuable resource for establishing fundamental knowledge in how to build for security and convenience.

Participant #14 believed that all security measures should be tempered by the principle found in the Hippocratic Oath that states, "First, do no harm." Many security systems, programs, and plans actually create problems that are often more serious than the ones they solve. Students must learn to think completely through security measures and understand all the potential ripple effects. Having a sound knowledge base about these security measures could aid students in understanding the ramifications of making decisions that have the potential to affect different areas of security.

Recommended Course Work

Participant #14 believed professional discipline is an important element in any endeavor. Course work on professional discipline should include an ethics component, which provides guidance to students on how to know the right thing to do, as well instruction on compliance and understanding how to do the right thing, even in the face of opposition.

Participant #14 spent years researching the causes of human error and how those errors can be limited. He believed that potential security personnel could benefit from coursework on error control. Courses should examine the causes of errors including psychological and physiological factors and provide students with techniques for controlling errors in their work environment. Students should be made aware of error reduction programs that, "…will allow people, peer to peer, to hold each other accountable."

While not always thought of in the context of communications, Participant #14 believed that course work on Career Resource Management that discusses the organizational flow of information, and the role of such characteristics as assertiveness, would be beneficial. He also pointed out that prioritization of communications is an important ingredient in the risk management equation and should be included in risk management courses. Media relations and the ability to communicate with the public through the media are often overlooked in discussions about security. However, Participant #14 encouraged course work in this area to prepare students to deal with and even use the media to assist in security endeavors.

In the area of security planning, Participant #14 recommended courses in change management, systems design and integration, along with practical applications similar to what the military calls war gaming. He also advocated instruction in the area of situational awareness which might be taught by someone with a strong industrial psychology background. He emphasized the need to understand how systems integrate by saying, "It is pretty easy to build a security program that actually makes things less

safe, if you are not careful." Course work that provides students with knowledge and skills in integration and design could help avoid that situation.

Participant #14 believed that course work in the areas of intelligence and cultural awareness is needed but he recommended caution. In the area of intelligence, he recommended that students be provided with a basic understanding of how to receive and use intelligence information, but they should also be taught how to supply information to the system.

Participant #14 suggested that cultural awareness classes be presented in a survey format, allowing students the opportunity to gain basic information while affording those more interested in specific areas to drill deeper into the subject matter. He believed an option in this area might be a class on comparative religions that informs students about the tenets of religions and their core beliefs.

Additional Contributions

Participant #14 advocated that, "…you can train and educate in anything, given the right instructional design and enough time." He recommended that the instructional design begin by determining the process to be used, followed by an examination of the current body of knowledge and resources available. Then a primary objective should be established which basically states, "…what you want this person to look like when they graduate." Once the vision of what a perfect program would look like if resources were unlimited is established, the application of actual resources available could shape the program and determine the final product.

Participant #14 also recommended that strong consideration be given to the operational relevance of the program. Does the program effectively meet the needs of the

students and industry? He emphasized this point by saying, "I think far too often, we hand over curriculum design to academic geeks like myself, and what you end up with is the course taught for teachers." Participant #14 believed the way to avoid that situation is to find people you trust in the industry to evaluate the curricula and tell you if the different elements deserve to be there.

Participant #14 recommended that any curricula include what he referred to as, "white space" or open area where additional course work can be included on short notice to take advantage of new and emerging trends. Inclusion of 10 to 15% white space would allow the program to remain vibrant and flexible. Change is never easy in the world of academia. He stated that, "…it is easier to move a small town graveyard than it is to change somebody out of an existing curriculum."

Since the aviation industry is so diverse and the needs of the various sectors are not always interchangeable, Participant #14 suggested consideration of a track system. Tracks could be established in the degree programs for commercial aviation, general aviation, and airlines security. Such a plan would allow students to gain the knowledge and skills necessary to function effectively in their specific areas of interest.

While he did not elaborate, Participant #14 touched on an idea previously mentioned in the study of a lifelong learning component. A lifelong learning component would be a program element allowing former students to stay connected to the university through specialized courses, seminars, and programs, while at the same time allowing the university to benefit from constant input from the field where actual challenges are being faced. This is an idea worthy of further examination.

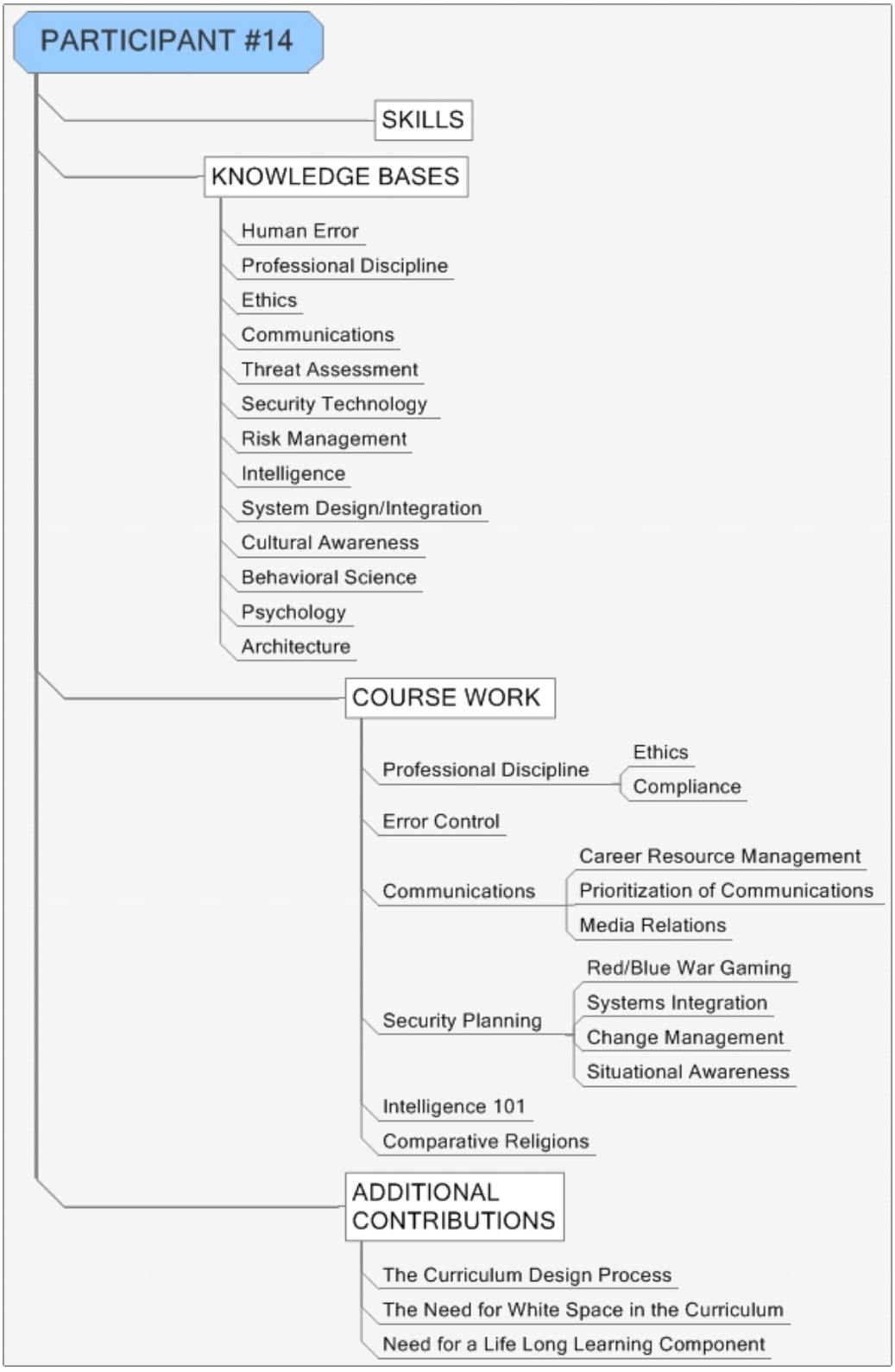

Figure 18. Participant #14 Overview

Discussion of Findings

The findings in this study involved an examination of the selected stakeholders' input related to the research questions listed in Chapter One. The three primary areas of concern dealt with stakeholder opinions in the areas of skill set development, the establishment of foundational knowledge bases, and recommended course work important to the development of those skills and knowledge bases.

In addition to the core areas of concern, each participant also provided additional contributions based on their unique perspectives. These contributions included ideas on marketing, curriculum design, finance, and requirements. Many of the ideas have direct application; others simply form the basis for additional research. However, all were worthy of mention.

Recommended Skill Sets

The participants' opinions on skill sets that aviation security collegiate programs should develop are reflected in Table 6. Eleven of the 14 participants responded to the topic of skill sets; the remaining three elected not to comment on skills and reserved their comments for other areas. Analytical thinking, communications, and collaborative relationship skill sets were the most often recommended skills.

One hundred percent of those responding believed that analytical thinking skills were important for future aviation security personnel. The ability to analyze information quickly and efficiently is a key skill needed in risk management, threat assessment, and decision-making. Analytical thinking skills included, but were not limited to, skills such as decision-making, threat analysis, statistical analysis, risk management,

conceptualization, and design. Following closely, 90.9%, or 10 of 11 participants, emphasized the importance of communications skills.

Communications skills included skills in areas such as oral communications, writing, salesmanship, making presentations, and instructional skills. Participants strongly believed that such skills were essential in aviation security careers. Several specifically mentioned the diverse nature of the aviation industry and the need for personnel to be able to communicate clearly and concisely not only with peers, but also with other sectors within the aviation community and the general public.

The third prioritized skill set concerned the ability to collaborate and build relationships. Eight of the participants, or 72.7%, believed such skills were highly desirable for security professionals. Again, many believed these skills were important due to the diverse nature of the aviation security field, and the fact that security personnel must work well with many different groups sometimes competing agendas.

Four participants, or 36.3%, suggested leadership, planning, and training skills as important skill sets for aviation security professionals. While communications skills are certainly necessary to be an effective trainer, other skills are sufficiently important to warrant being considered as a separate category. Likewise, as with planning and leadership where many other skill sets overlap, these are sufficiently important to warrant their own categories.

Three participants, or 27.2%, identified computer skills and administrative or management skills as important to future security professionals. The remaining skill sets were mentioned by only one or two respondents and most could be considered subordinate skills to those previously mentioned.

All the skill sets mentioned could fall into one of three broad categories: thinking, communications, or relationship skills. Any aviation security collegiate program should consider course work that develops skills in these key areas of concern.

Table 6.

Skill Set Development Recommendations

	Participant														
Skills	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Totals
Analytical	X	X	X		X	X	X	X	X	X		X	X		11
Communications	X	X	X		X	X	X		X	X		X	X		10
Col/Relationship		X	X			X	X	X	X	X		X			8
Leadership		X			X	X						X			4
Planning						X			X	X		X			4
Training						X	X		X			X			4
Computer	X				X		X								3
Adm/Mgmt					X					X			X		3
Conceptualization	X							X							2
General Technical	X	X													2
Salesmanship	X					X									2
Flexibility	X		X												2
Observational			X					X							2
Team Building							X		X						2
Prioritization			X					X							2
Cultural Awareness	X														1
Situ Awareness	X														1
Decision-making	X														1
Organizational			X												1
Problem Solving					X										1
Research					X										1
Networking					X										1
Statistical							X								1
Language							X								1
Goal Setting							X								1
Enforcement												X			1

Recommended Knowledge Bases

The 14 participants provided a total of 115 responses identifying 32 knowledge bases they believed were important for future aviation security personnel. The

knowledge bases were divided into aviation, security, and related knowledge bases. Aviation knowledge bases accounted for 11, or 9.5%; security responses accounted for 56, or 48.6%; and related responses accounted for 48, or 41.7%, of the 115 responses received.

Aviation related knowledge bases included the aviation industry, aviation business, and aviation economics. The aviation industry knowledge base includes an overview of all segments of the industry including airlines, commercial, corporate, and general aviation. The focus would be to provide students with a good general understanding of the aviation industry and the role of each of the industry's subordinate parts.

The most suggested knowledge base in the aviation category was aviation business with 5, or 4.3%, of the total responses. Several of the participants focused on the business aspects of the industry and were particularly concerned about the need for aviation security personnel to understand how important it is for balance to exist between the security and business needs of aviation. They believed that students who understand how aviation businesses actually function would be in a much better position to develop and implement security measures that could satisfy the needs of both areas. The ability to build such balanced systems would be highly prized by future employers.

While economics in general is a closely related field to business, two of the 14 participants mentioned the need for specific knowledge in the area of aviation economics. All industries have unique economic challenges that impact their ability to maintain a favorable financial picture. Those participants believed that students who understand the

economics of aviation and how difficult it is to achieve a positive financial status would be far more likely to design realistic security programs.

There were 56 responses accounting for 48.6% of the total responses recommending nine security-oriented knowledge bases. Ten, or 8.6%, of the total responses dealt with risk management followed closely by nine responses, or 7.8%, referring to the need for base knowledge in the area of intelligence. The need for a pillar of knowledge in security technology elicited eight responses, or 6.9%, of the total. Aviation specific security and systems design accounted for six responses each, or 5.2%, respectively.

Terrorism and threat assessment both received five, or 4.3%, of the total recommendations, followed by criminal justice with four recommendations, and law/regulations knowledge with three, or 2.6%. The terrorism knowledge base included such topics as international terrorism, domestic terrorism, history of terrorism, and counter-terrorism. The recommendations for a criminal justice knowledge base centered on the need for general knowledge of the criminal justice system and how that system interfaces with security. Three of the responses indicated the need for at least a basic understanding of the laws and regulations that affect security personnel and the development of security systems.

Participants identified 20 related knowledge bases they believed relevant to the development of aviation security curricula. The knowledge bases fell into four groups according to the number of responses. Group one contained those with four to seven responses, group two had three responses, group three had two responses, and those in group four had only one response each.

Group one included cultural studies with seven, or 6% of the total responses, analysis with five, or 4.3%, and general business with four, or 3.4% of the total responses given. Due to the global nature of both the aviation business and the threats to the industry, participants believed that future security personnel should be well versed in other cultures in order to more fully understand the overall security environment.

Participants also believed that it was important that students not only understand the business aspects of aviation, but also general business principles as well. These principles include management, cost-benefit analysis, and organizational design. It was believed that students with such knowledge would be more effective members of the management team able to blend the needs of security with those of business.

Group two consisted of six general knowledge categories with each knowledge base receiving three responses. The categories included history, leadership, organizational studies, communications, psychology, and architecture. Participants believed that a foundational knowledge of history would be instrumental in helping future security personnel avoid the pitfalls of the past while building on past successes.

Participants identified leadership, communications, and organizational studies as knowledge bases needed by future security personnel. They believed that an understanding of leadership theory and principles along with a foundational understanding of corporate communications and how organizations function would greatly assist students entering the aviation security field.

Participants also believed a general knowledge of psychology, especially in the areas of the psychology of terrorism, victimization, and behavior analysis, would provide students with needed information. That knowledge could aid students in making accurate

and timely decisions, more accurate threat assessments, and perhaps avoid embarrassing misunderstandings.

Participants also believed that some foundation knowledge in the area of architecture and building design would be of significant benefit to security personnel. In the wake of the September 11, 2001, attacks, many airports and aviation facilities have either been renovated, or will be in the not too distant future. Participants believed that security personnel should learn how architecture can be used to minimize risk and enhance business opportunities.

Group three consisted of knowledge bases in the areas of foreign policy/relations, behavioral science, and ethics with each knowledge base being identified by two participants. Group four consisted of eight knowledge bases that were mentioned by only one of the participants. Those knowledge bases were political science, liberal arts, computer technology, sociology, statistics, human error, professional discipline, and languages. Table 6 illustrates the knowledge bases by participant and Figure 19 provides a graphic view of the knowledge bases categories.

Table 7.

Knowledge Base Recommendations

	Participant														
Knowledge Bases	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Totals
Risk Management	X	X	X			X	X	X		X		X	X	X	10
Intelligence		X	X	X	X	X	X		X				X	X	9
Security Technology	X	X	X			X	X			X		X		X	8
Cultural Studies			X		X	X	X	X				X		X	7
System Anal/Design	X					X				X	X	X		X	6
Aviation Security			X	X		X			X	X		X			6
Aviation Business	X		X						X		X		X		5
Threat Assessment	X	X	X										X	X	5
Terrorism	X	X					X	X	X						5

Table 7. (continued)

Knowledge Base Recommendations

Knowledge Bases	Participant 1	2	3	4	5	6	7	8	9	10	11	12	13	14	Totals
Analysis			X			X			X	X		X			5
Aviation Industry	X									X	X		X		4
General Business				X	X	X					X				4
Criminal Justice				X	X				X			X			4
Communications	X											X		X	3
History	X	X							X						3
Leadership	X	X										X			3
Laws & Regulations					X				X				X		3
Psychology		X			X									X	3
Architecture				X	X									X	3
Organizational Studies			X	X		X									3
Foreign Pol/Relations		X					X								2
Behavioral Science		X												X	2
Economics					X								X		2
Ethics							X							X	2
Political Science									X						1
Liberal Arts					X										1
Statistics							X								1
Human Error														X	1
Sociology	X														1
Professional Disc														X	1
Computer Tech	X														1
Language							X								1

To instill the needed skills sets and establish the knowledge bases students require to be successful in the aviation security field, robust curricula must be developed. The participants in this study made numerous course work recommendations aimed at achieving those goals. Appendix G lists the course work recommendations made by the participants with the numbers depicting multiple recommendations. These recommendations provide a deep pool of courses from which curricula could be established.

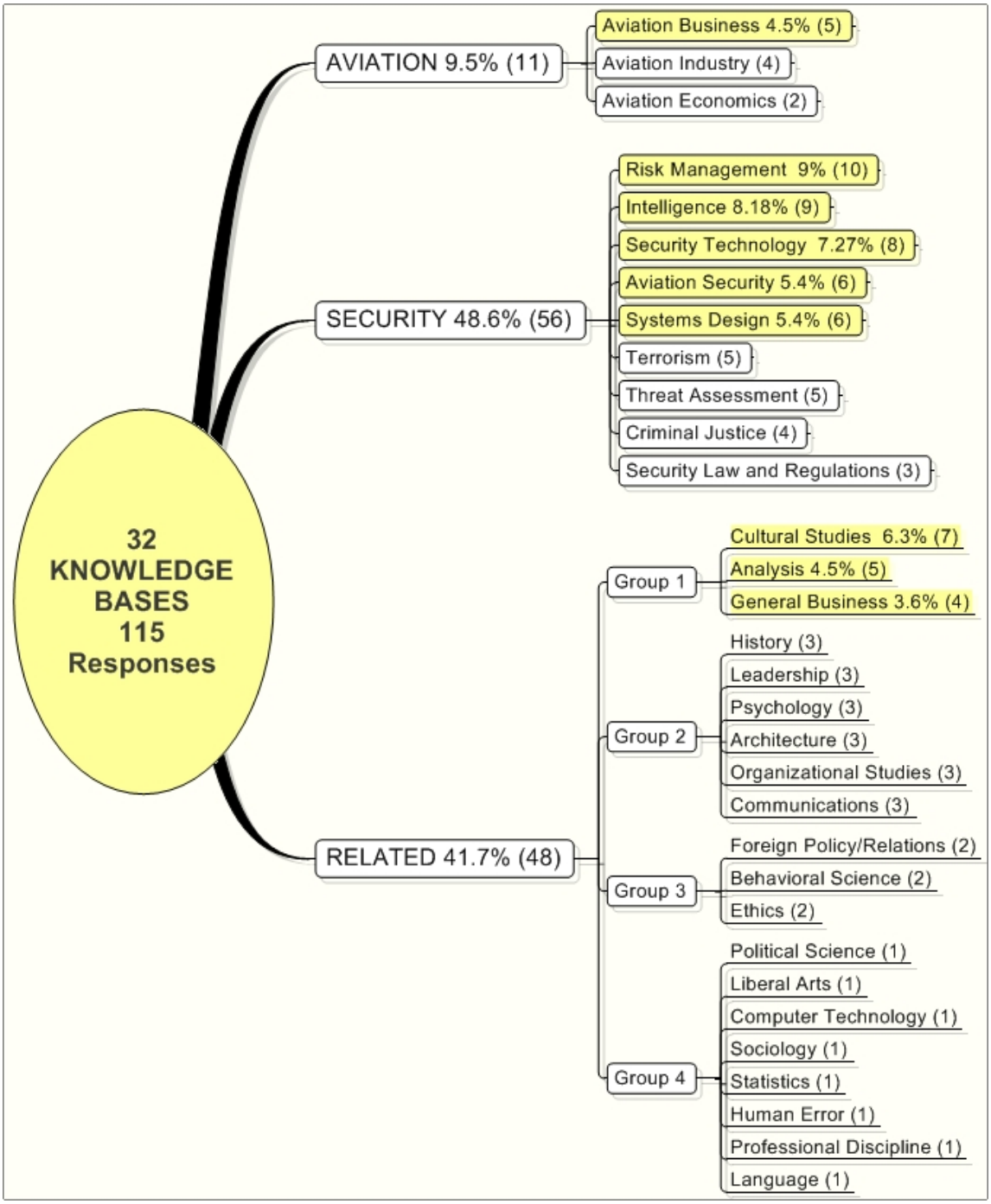

Figure 19. Knowledge Bases Categories

CHAPTER V

CONCLUSIONS AND RECOMMENDATIONS

Introduction

The purpose of this study was to develop a set of stakeholder driven recommendations for aviation security curricula based on stakeholder input to the following three research questions;

1. From a multi-discipline approach, what skill sets do stakeholders consider essential to enhancing aviation security?
2. From a multi-discipline approach, what core knowledge bases are essential for students entering the aviation security field?
3. What specific course work should be incorporated into collegiate aviation security programs to provide students with the knowledge and skills needed to meet current and future aviation security challenges?

The conclusions that follow are meant to be used to enhance the development of future aviation security programs. They are universal in nature and designed to be applied throughout all program levels. They discuss the need for security programs, outline areas of emphasis, and delineate several key design considerations.

The value of research has long been gauged by the validity and reliability of the study. In Chapter 3, the vital role of validity in qualitative work was established and triangulation recognized as a primary method of measuring validation. In an effort to

insure validity, each of the following conclusions was based on the triangulation of data from three or more participants.

Conclusions

Throughout the study, several recurring themes surfaced that warrant consideration in program design. Many of the themes will be covered in specific course work but all should be incorporated into the fabric of the individual programs. Topics such as risk management, leadership, communications, and cultural diversity should not be limited to an individual course but should be incorporated into all courses and become a part of the overall academic environment.

Participants pointed out the likelihood that the future will bring the need for more security not less, the fact that thousands of security jobs now exist, and that there are very few true aviation security professionals available to fill the void. A national search of major universities yielded only one aviation security degree program. Reference Appendix F. Even though the search was not exhaustive, and other programs may exist, it was indicative of a shortage of university programs in this discipline. It would be reasonable to conclude that sufficient need exists to support the creation of collegiate aviation security programs.

Areas of Interest

Risk Management – Many of the participants agreed with Schneier's (2003) concept of risk management where security programs are designed around analysis of real versus perceived threats with careful consideration being given to the impact of any security plan on the overall operation. Risk management course work should be included in the curricula, but beyond that, risk management principles must be interwoven into

every course to the point that risk management and aviation security principles become inseparable. Participant #8's recommendation to name the program: *Aviation Security, a Risk Management Perspective,* has merit.

Interpersonal Communications – Another major concern of most participants was interpersonal communications; most participants believed that communications skills were fundamental to aviation security work. Therefore, classes should be designed to insure students develop good writing, oral communication, and presentation skills. Regardless of class orientation, students should be required to complete projects that will create and enhance those skills.

Concepts of Business – Numerous times during the course of this study, participants elaborated on the need for security personnel to understand aviation in general, and the business aspects of aviation, specifically. Programs from Certificate through Masters Degree must include course work that prepares students to understand the business aspects of aviation. Central to this understanding is the economics of aviation and aviation management.

Several participants emphasized the need for security personnel to balance security planning and measures with the reality of making a profit. Balance, coupled with realistic threat evaluations, must become the standard for security planning and must be emphasized throughout any established program.

Global Perspective – Participants reiterated the global nature of the aviation industry and the need for all aviation security programs, regardless of level, to prepare students to work in an international environment. Aviation, by its very nature, covers the globe with the threats to the industry knowing no international boundaries. Based on

stakeholder input, programs must provide students with a basic understanding of the world environment and some appreciation for the complexity of international relations.

Cultural Studies – Closely related to the global concerns and equally important is the need for students, who become players on this international stage, to be culturally aware. They must understand not only the source of threats, but also the cultural and nationalistic motivations that create and drive those threats.

Graduates of aviation security programs must possess an understanding of world geography, international policies, global economics, world religions and languages. Regardless of the segment of industry, such knowledge can provide future security personnel with the ability to more clearly understand the threat and design realistic programs to mitigate that threat. Students must also be exposed to international security systems and understand how security issues are addressed around the world.

Analytical Thinking – Throughout this study, participants made numerous references to the need for students to be well-versed in analytical thinking skills and techniques. They believed that such skills were critical for effective and efficient threat analysis used by security personnel on a daily basis. In addition, analytical skills aid students in understanding technical studies, in the development of cost effective security programs, and the interpretation of data critical to security planning.

Students should be required to take course work that provides base knowledge in the area of analytical thinking and use that knowledge in projects and assignments throughout the various aviation security programs. The use of practical exercises with immediate after action reviews was cited as an excellent technique to give students experience in using and developing analytical skills. Whenever the opportunity presents

itself, practical exercises should be incorporated into the course work with as much realism as possible to provide not only analytical thinking opportunities, but also leadership development.

Leadership – Participants used terms such as: taking charge, team building, and collaboration skills that all referred to leadership. Leadership is critical to development of effective security systems, building relationships, and implementing programs that meet the needs of a very complex aviation industry. Nothing can take the place of leadership when things go wrong and decisions must be made quickly with limited information under extreme stress. The need for leadership development is basic to all aviation security programs.

Program Design Considerations

During the study, several recurring themes emerged concerning how programs should be designed and implemented. Participants voiced strong concern about issues such as flexibility, accessibility, and the need for a strong lifelong learning component. The following conclusions were based on those concerns and the participant's ideas on how those concerns might be addressed.

Flexibility – There was a very strong consensus that all programs must have the ability to adapt quickly to changes in the industry. Participants currently involved in both the general aviation and air carrier sectors emphasized the need for programs to remain current in light of the rapidly changing security environment. New threats arise quickly and propagate new security solutions. New technologies in the field are emerging almost daily with worldwide security techniques constantly evolving. Programs must find new and innovative ways to stay current and bring the most current knowledge to the students

involved; failure to do so will result in security personnel who are constantly fighting the last war.

Accessibility – Participants from every category: academia, security, and aviation all believed that the effectiveness of aviation security programs would be directly affected by the accessibility of the programs. They strongly urged that maximum use be made of on-line learning, distance learning, and teaching techniques that provide both traditional and non-traditional students with learning opportunities.

Participants believed that such programs could be marketed through aviation associations and possibly financed with government sponsored programs making them accessible to many who would otherwise be denied learning opportunities. This is especially true in the general aviation sector where training and educational funds for small aviation concerns are extremely limited.

Lifelong Learning Component – Another recurring theme was the need for a continuing education component. Some participants called it a staged program; others, continuing education, and still others referred to it as the need for a lifelong learning component. The latter would seem most appropriate, but all concluded there was a strong need to create a method of keeping those with certificates and degrees in aviation security current. Specific techniques will be discussed in the recommendations section of this work.

Recommendations

Future Demand for Aviation Security Education

The findings of this study related to demand versus current supply in the field of aviation security education support a recommendation that academic institutions increase

their offerings in the field of aviation security. In order to bridge the current gap between supply and demand of intellectual capital in that field, it is imperative that academic institutions address the current deficit as well as projected future requirements. A number of comments by participants in this study supported this recommendation.

Early in the study, Participant #1 stated his belief that the future would require more, not less, security and that the demand for security professionals would only increase in coming years. Others reinforced the need for security education programs, pointing out that few true security professionals exist today, and no major university has stepped forward to meet current needs or future demands. This comment was consistent with the findings outlined in Chapter IV and Appendix F of this study where an Internet search of over 100 major universities nationwide found only one aviation security degree program.

Participant #10 expanded on the concept of demand with his projections that many supervisors, managers, executives, and aviation customers also have identified a need to be better informed on security matters. This would constitute a large potential customer base for all security programs, especially the certificate program.

In order to address projected demand for aviation security education, this study obtained sufficient stakeholder input to develop recommended curricula for aviation certificate and degree programs. Program recommendations were divided into Certificate, Bachelors Degree, and Masters Degree programs. Additional recommendations were also made by stakeholders related to overall emphasis, marketing, and methods for implementing a lifelong learning component.

Aviation Security Certification Program (Langley Model)

Certification programs with curricula imbedded in degree requirements are an excellent tool for addressing intellectual capital needs of a volatile industry in that they are flexible and easy to adjust to the rapidly changing technology and threat environments. In addition, certificate programs facilitate the ongoing continuing education requirements of the aviation and security industries. The following recommendations related to Certification Program development were gleaned from stakeholder opinions.

Certification as Foundation – The Certificate Program should be the foundation for development of intellectual capital in the field of aviation security education. It is recommended that the findings of this study be incorporated into well-developed certificate curricula which are fully accredited and applicable to a degree program. Participants in the study with academic backgrounds emphasized that certificate programs were easier to initiate than degree programs, could be used to gauge the needs within the discipline, and tend to be much easier to adjust than degree curricula. The certificate program should be consistent with degree programs with course work being applicable to higher degrees.

The findings of this study further indicate that a Certificate Program would appeal to both undergraduates just starting their higher education careers and to those already working in the industry who have a need for basic aviation security knowledge or periodic updates. This Certificate Program should be designed to meet the needs of both groups while laying the foundation for advancement into the degree programs. The courses required to attain a certificate in aviation security will fit into the bachelor's

degree program allowing students to build on their previous work without loss of momentum.

Hybrid Course Delivery – It is recommended that all but three hours of the aviation security certificate program be available on-line with the final three hours of the program offered as an annual on-campus seminar. The on-line format would allow for a much wider market base giving the program an even greater chance at success. On-line marketing and close coordination with aviation associations and organizations could provide the best opportunity for maximum participation.

Grants and Financial Aid – It is recommended that avenues for financial aid to students specializing in aviation security and aviation research should be pursued with political and industry entities. Just as law enforcement incentives in the 1960s and 1970s raised the level of professionalism in that field, incentives in the aviation security field can raise the level of professionalism. Programs offering financial incentives to students conducting research or pursuing degrees in the field of aviation security could undoubtedly lead to more effective security and a safer aerospace environment.

Since the September 2001 attacks, a great deal of emphasis has been placed on airline security while many other vital sectors of the aviation industry, such as general aviation, have struggled with the development and implementation of security programs. Lack of funding and governmental emphasis on general aviation, commercial non-passenger, and corporate aviation has resulted in little progress in assessing the real threat and implementing realistic solutions in these areas. Therefore, the possibility of federal or private grant funding for new and innovative programs is a very real possibility.

Certificate Program Description – The Certificate Program is composed of 18 hours of core courses and a three-hour lifelong learning component. The core courses are common to the Bachelors Degree Program and include the following:

- Risk Management
- Principles of Security
- Threat Analysis and Assessment
- Security Technology
- Aviation Economics
- The Role of Intelligence in Aviation Security

Lifelong Learning Component – The final three hours of the program should be attained through an annual on-campus seminar. This seminar should include guest lecturers from the various sectors of the aviation security industry around the world with the focus on new trends and developments. Successful completion of the seminar would complete the course requirements for new certificate holders and re-certify current certificate holders.

The seminar approach has several major advantages. It would provide an avenue for certificate holders to remain involved, updated, and in touch with the university; and it would encourage them to pursue higher degrees in the field. It would provide a setting for networking and establishing vital working relationships with colleagues both nationally and internationally. In addition, the annual seminar would provide an excellent opportunity for graduate students to present their research findings, thereby gaining experience and needed academic credentials. The university would benefit not only financially from increased participation, but also academically, by a constant

refreshing of essential aviation security knowledge bases. Appendix H provides a schematic of the Langley Aviation Security Certification Model based on stakeholder input.

Aviation Security Bachelor of Science Degree (Langley Model)

The Aviation Security Bachelor Degree model described here is a direct reflection of stakeholder input contained in this study. Some aviation security specific needs would require coursework development, but the remainder of the curriculum is comprised of course work common to most major universities making the model highly adaptable. Universities with strong aviation departments would have a decided advantage in implementing the model, but such implementation would not be outside the realm of possibility for any university with a passion for prevention.

General Education – All students begin their higher education career in the general education domain. There students are expected to gain knowledge common to those with a college degree, but it is also the formational point in a student's intellectual growth at which time they are most pliable. The general education curricula provides an excellent opportunity to set the tone for the degree program and establish long term learning interests.

This degree model places heavy emphasis on courses that develop analytical thinking and communications skills while establishing political and cultural knowledge bases needed to be effective in an ever-shrinking world. The English composition and oral communication, the social and behavioral science, and analytical and quantitative thought segments all provide options. Those options offer students flexibility but assure

the program retains the ability to address issues stakeholders considered critical. The 42 hour General Education requirements are:

9 hours of English Composition and Oral Communications

- Freshman Composition
- Critical Analysis and Writing (or)
- Technical Writing
- Introduction to Speech Communication

9 hours of History and Government

- World History
- Introduction to International Relations
- Comparative Politics

6 hours of Arts and Science

- Computer Proficiency
- Abnormal Psychology

12 hours of Social Science and Behavioral Science

- Racial and Ethnic Relations
- Religion, Culture and Society (or)
- Culture, History and World Systems
- Introduction to Psychology
- Abnormal Psychology (or)
- Conflict Resolution

6 hours of Analytical and Quantitative Thought

- Introduction to Quantitative Risk Analysis

- Statistical Methods (or)
- Introduction to Statistical Analysis

Core Course Work – The 45 hours of required courses in this model directly address the establishment of knowledge bases and skills participants in this study believed critical for those entering the field of aviation security. They are listed in priority order with risk management being the primary course followed closely by course work defining the role of intelligence, security technology, world cultures, and systems design.

Risk management should not only be *a course,* it should be, *the course.* The idea of using analytical thought processes and risk management approaches must permeate the program with such emphasis that the application of those principles become as automatic to security personnel as running a preflight checklist is to a pilot. It is the pathway or course leading to more effective and efficient security consistent with the beliefs of stakeholders and authors such as Slovic (2000), Thomas (2003), and Schneier (2003) listed in the review of the literature.

Thomas (2003) stated, "The most powerful weapon against terrorists and criminals is intelligence" (p. 208). The vast majority of participants in this study agreed with the importance of intelligence. The prevailing belief was that students need not have an extensive knowledge of intelligence processes, but they must leave the program with a clear understanding of the role of intelligence in security work. They need to understand how information is gathered, by whom, and how that information can be obtained from and provided to agencies responsible for its processing.

The need for students to understand and be capable of exploiting technology was also a priority with stakeholders. Few would argue with either the importance or evolutionary speed of technology. The Internet provides a vast amount of information to friends and foes alike, and a means of communicating that information with lightning speed. Only through the use of all aspects of technology can security personnel meet the challenges of the information age. The required security technology course would provide the student with foundational knowledge upon which to build a career technology superstructure.

No industry is more global in nature or more challenged by international security issues than aviation. To meet those challenges, future security personnel must be prepared to work in the world community. The required world cultures course brings to the curriculum the groundwork needed for students to understand other cultures, which is the first step in building working relationships essential to security personnel. This knowledge could aid understanding foreign threats, avoiding misunderstandings, and developing effective security systems both at home and abroad.

The modern world is an incredible maze of systems layered upon systems. Aviation security study must understand how systems are designed, how they function, and perhaps most importantly, how they fail. The required systems design course provides the underpinnings needed for students to understand systems and how to design systems that work and fail.

The remaining required course work is designed to build the skills and establish the knowledge bases identified by stakeholders. Collectively, the knowledge bases create the ability to understand the industry, balance business and security needs, make realistic

assessments, and develop effective plans in a global environment. These courses could increase the professionalism of aviation security personnel and ultimately result in a safer aviation environment for all. The core courses are:

45 hours of Core Courses

- Risk Management
- The Role of Intelligence in Aviation Security
- Security Technology
- World Cultures
- Security Systems Design
- Principles of Security
- Aviation Business
- Threat Analysis and Assessment
- Dynamics of Analytical Thought
- History and Trends in Terrorism
- Aviation Economics
- Security Organization and Management
- Airport Security and Operations
- Aerospace Industry Overview
- Aviation Security Law

Recommended Electives – The 12 hours of recommended electives continue to guide students in stakeholder desired directions. These courses continue to build knowledge of the aviation industry, provide needed background on aviation-related issues, help establish the global mindset, and provide the tools for effective leadership.

This segment of the program must remain flexible with courses being added or deleted as needed depending on the changing world security environment. Participant #14 emphasized the need for what he referred to as "white space" in the curriculum. White space is an area deliberately left blank to insure programs can rapidly adjust to a rapidly changing world. The Slovic model found in Chapter Two clearly demonstrates how social impact can affect security. Universities must be able to quickly adjust as new needs are identified.

Other participants, particularly from the business sector, emphasized that one problem with current programs is their inability to shift quickly to meet new real world demands. Reevaluating and replacing courses in this section each year, with minimal red tape, could insure the program stays abreast of challenges and issues in the field. This requirement could provide ten percent white space and add immeasurably to the viability of the overall program. Initial Recommended Electives are:

12 hours Recommended Electives (Change Annually as Needed)

- Ethics
- Principles of Flight
- Aviation Leadership
- World Regional Geography
- Decision Making
- Introduction to Criminal Investigation

Contextual Learning – This segment of the curriculum offers another opportunity for flexibility. Students may choose to participate in a capstone program, a practicum, or an internship which would afford a wide range of learning opportunities. A capstone

project directly ties to a specific course that allows the student to apply learning. A practicum is a course that involves supervised practical application of previously studied theory. An internship involves a paid or unpaid opportunity to apply all learning acquired during the degree program in a contextual environment. Such opportunities serve dual purposes by allowing students exposure to the aviation security field, while allowing potential employers to evaluate their potential as a future employee.

Interdepartmental Studies – A major strength of the university system is the ability to draw the highest quality knowledge from a wide range of disciplines. The inter-departmental studies portion of this curriculum is specifically designed to capitalize on that strength. By taking advantage of experts in the fields of business, political science, architecture, and philosophy, students would have the dual benefit of learning from experts in the field and viewing issues from a different perspective.

A recurring criticism by those involved in both the security and business segments of the industry was that academia moves too slowly to keep pace with demands. This inability results in what at least two participants in this study called, "fighting the last war." In keeping with stakeholder recommendations, this section should also be subject to change as needed. As previously mentioned by Participant #14, it is often extremely difficult to change curricula due to academic bureaucracy, but failure to do so quickly often leads to an inability to stay on the cutting-edge. The Interdepartmental course work recommendations are:

15 hours of Inter Departmental Studies

- Business
    - Cost-benefit Analysis

    - Organizational Communication (or)
    - Business Report Writing
- Political Science
    - World Political Systems (or)
    - Comparative Politics
- Architecture
    - Security Design (or)
    - Building Systems
- Philosophy
    - Logic and Critical Thinking

Appendix I includes a schematic of the Langley Aviation Security Bachelor of Science Degree.

Aviation Security Master of Science Degree Program (Langley Model)

The Master of Science Degree in Aviation Security is designed to expand the knowledge bases previously established while providing students with new skills in the area of research. The program accomplishes those goals through core requirements, research requirements, program emphasis requirements, and a thesis. The expanded knowledge prepares students for higher levels of responsibility in the aviation security industry.

The new or enhanced research skills could be used to complete a masters thesis requiring students to demonstrate critical thinking skills in the areas of decision making, organization, and analysis. The defense of that thesis allows students the opportunity to hone presentation and communications skills in a realistic setting. In combination, the

Masters Degree requirements meet the concerns identified by stakeholders in this study and prepare both traditional and non-traditional students for greater responsibilities and further studies.

Core Requirements – The core requirements require students to examine two critical areas early in the program. The Aviation Security Executive Development course draws the focus inward. Students are exposed to the unique demands placed on executives in this high pressure, rapidly changing field. Armed with that knowledge, students can assess their abilities, tailor program emphasis hours, and select research topics, thereby receiving maximum benefit from the program.

The remaining core course, Global Issues in Aviation Security, also serves a dual purpose. It raises the student's level of awareness by bringing into clear view the trends and challenges facing the industry at that point in time. Then, it again allows students to tailor their program based on current knowledge. Core requirements are:

6 hours Core Requirements

- Aviation Security Executive Development
- Global Issues in Aviation Security

Program Emphasis – Program emphasis hours are designed to do just that, allow students to place emphasis on selected areas of interest or need. The course pool available for selection covers a broad spectrum of courses relevant to aviation security graduate students. Courses available for program emphasis include:

12 hours Program Emphasis

- Electronic Surveillance Systems
- Biometrics in Security

- Security Challenges in General Aviation
- Information Systems Security
- Perimeter Security Systems
- Layered Security Design
- Advanced Business Plan Formulation
- Public/Private Sector Interface
- Air Cargo Threats and Countermeasures
- World Trends in Airline Security
- Corporate Aviation Security

Research Requirements – The research requirements for the Masters of Science in Aviation Security are also multi-faceted in that they not only impart knowledge but provide students with the tools they need for future work. The emphasis on research by American universities is directly related to the fact that Americans enjoy the highest standard of living on earth. If students desire to advance in their professional or academic careers, they must gain the ability to conduct effective research.

In our high-tech society, an often overlooked but highly critical element of research remains the university library. The library is not simply a repository of dusty books; it is a portal to worlds of knowledge, if the student knows where to find the "port keys." The first research requirement is for students to take an extensive course on library networks and data bases. This information is vital to establishing good research techniques and to unlocking volumes of valuable and relevant information.

Students should be encouraged to select research topics early in the process which allow them to formulate their research questions and determine the methodology for their

research. Based on their decision as to the type of research, students can select either a quantitative or qualitative course which to aid them in their study. Regardless of approach, all students need a basic understanding of the design and methodology of research. Research requirements for the Masters of Science in Aviation Security are:

9 hours of Research

- Library Networks and Data Bases
- Research Design and Methodology
- Introduction to Qualitative Inquiry (or)
- Statistical Methods

Thesis – Many programs have opted to lessen the burden on graduate students by providing research options with less strenuous standards, and some have even removed the research element completely in lieu of additional course work. Based on the emphasis stakeholders in this study placed on critical-thinking, communications, and organizational skills, failure to include a thesis is not a viable option.

6 hours Thesis

- Pre-Approved Topic
- Committee Defense Required

Appendix J provides a schematic of the Langley Model for the Master of Science in Aviation Security Degree.

Final Recommendations

Program Funding – During the late 1960s and early 1970s and due in part to several highly publicized events, the American people, and ultimately the government, saw a need for increased professionalism in the law enforcement profession. Many

programs were implemented under the Law Enforcement Assistance Program (LEAP) umbrella to accomplish that goal. Some programs focused on training; others on equipment, and still others on educational programs.

The educational element provided grants to students pursuing law enforcement degrees. The grants provided full tuition payment and reimbursement for all books and educational materials. This program allowed thousands of police officers to obtain university degrees with the effects still being realized today. This was arguably the most significant step toward the professionalization of law enforcement in history. Nearly all American university level law enforcement degree programs can trace their origins back to this era.

The key to success of law enforcement degree programs was funding. The participants in this study with academic backgrounds emphasized the fact that university programs exist because of funding. Regardless of how worthy or needed a program is, it simply cannot be instituted without financial backing. The need for aviation security education programs, especially in the field of general aviation, is undisputed. Billions of dollars have been spent on security measures while the most effective security device, the human mind, has been neglected. It is therefore recommended that every effort be made to influence legislators to fund educational programs and opportunities in the field of aviation and aerospace security. An historical model exists, and by building on and improving that model it is possible to obtain funding which will directly influence both the professionalism of the aviation security field and the security of the aviation industry.

Future Research – Most research projects raise more questions than they answer, and this study is no exception. Research opportunities in the field of aviation security abound.

1. Research into the development of an effective funding model based on either historical research or an in-depth industry needs analysis would be very beneficial to those seeking funding to develop or enhance aviation security degree programs.
2. The field of aviation has become a part of an aerospace industry that is rapidly evolving and expanding. The aerospace industry is rapidly increasing in size, complexity, with a major economical impact. Research is needed to discover the most effective means of providing a safe and secure environment for the various segments of the industry. Aerospace manufacturing, design, maintenance, and information systems are all potential targets. Effective security systems need to be developed to insure the safety of these vital processes.
3. Research into effective systems integration between private and public sectors could produce systems that leverage and enhance our current ability to process information and distribute it quickly to those with the ability to make a tactical difference. Research is needed to develop systems that balance the need for individual privacy with the need for public safety. These complex issues cannot and should not be successfully resolved without careful consideration of the social and political implications of applied technology.
4. This study indicates a definite need for research to determine the most effective educational methods for imparting knowledge and skills needed in aviation security. During the study participants emphasized the need for practical

exercises, and emergency planning projects. Recommended curricula included opportunities such as internships and capstone projects to expose students to real world scenarios, however further research is needed to expand on the role and effectiveness of other techniques which allow students to obtain practical experience in field.

5. Research is also recommended to ascertain specific needs in the broader field of aerospace security. In this ever expanding field new challenges are constantly arising requiring new and innovative approaches to education. Such research could result in the development of specific minors or tracks being developed to address the needs of specialized segments within the industry.

The ability to succeed in making ourselves and our industry safe resides in the ability to prepare the minds of those who are now in the field and those who take up the cause in the future. Education is fundamental to the development of the intellectual capital required to support the aerospace industry as a whole. Although this study focused primarily on the aviation segment of the industry, continued research is imperative to address manufacturing, maintenance, general aviation, and other segments potentially affected by similar threats to security.

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APPENDICES

APPENDIX A

IRB APPROVAL FORM

Oklahoma State University Institutional Review Board

Date:	Monday, February 05, 2007
IRB Application No	ED078
Proposal Title:	A Qualitative Inquiry of Stakeholder Recommendations for Collegiate Aviation Security Curriculum
Reviewed and Processed as:	Expedited

Status Recommended by Reviewer(s): Approved Protocol Expires: 2/4/2008

Principal Investigator(s

Alvin DeWade Langley
10105 Leads Drive
Yukon, OK 73099

Mary Kutz
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Okla. City, OK 73162

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

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

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

1. Conduct this study exactly as it has been approved. Any modifications to the research protocol must be submitted with the appropriate signatures for IRB approval.
2. Submit a request for continuation if the study extends beyond the approval period of one calendar year. This continuation must receive IRB review and approval before the research can continue.
3. Report any adverse events to the IRB Chair promptly. Adverse events are those which are unanticipated and impact the subjects during the course of this research; and
4. Notify the IRB office in writing when your research project is complete.

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

Sincerely,

Sue C. Jacobs, Chair
Institutional Review Board

APPENDIX B

PARTICIPANT CONSENT FORM

CONSENT FORM

Project Title:

A QUALITATIVE INQUIRY OF STAKEHOLDER RECOMMENDATIONS FOR COLLEGIATE AVIATION SECURITY CURRICULUM

Investigator:

The investigator is pursuing the degree of Doctor of Education, Applied Educational Studies, Aviation and Space Specialization at Oklahoma State University. He is also an adjunct faculty member at Oklahoma State University where he instructs both undergraduate and graduate Aviation Security classes. He is currently the Director of the Oklahoma State Bureau of Investigation a position he has held for the past twelve years.

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Email: drkutz@cox.net

Procedures:

You have been selected to participate in a study because of your status as a key aviation security stakeholder. Interviews will be conducted between January 31, 2007, and May 1, 2007. The investigator will be interviewing several aviation security stakeholders from government, the private sector, and academia, and will be contacting you to arrange a convenient interview time.

The interview should last no more than one hour. However, in the event the interview is interrupted or discontinued for any reason, it may be necessary to reschedule and conclude the interview at a later date.

The interview will include questions concerning your personal background, educational history, and your views on aviation security. With your permission, an audio recording will be made of the interview to aid in data capture and analysis. Audio recordings, interview notes, their transcriptions or transcribed data sets will be assigned a number. Once the number is assigned, no other identifiers will be associated with the audio recordings, interview notes, or their transcribed data sets.

When not being transcribed, analyzed and used for purposes of this study, and until their destruction, the audio recordings and the investigator's interview notes will be maintained and locked in the home safe of the investigator.

The transcribed data sets will be synthesized and analyzed by the investigator. The Oklahoma State University Institutional Review Board has the authority to inspect consent records and data files – data sets to assure compliance with approved procedures. Further, the investigator's faculty advisor, the investigator, and the person transcribing audio recordings and interview notes into data sets will have access to those audio recordings, interview notes and data sets. When not being used for analysis and study purposes and until destroyed as set forth in this consent form, all interview audio recordings, interview notes and transcribed data sets will be maintain and locked in the home safe of the investigator.

Once audio recordings are transcribed and the data synthesized and analyzed, all audio recordings and interview notes will be destroyed by shredding to protect confidentiality. A record of that destruction will be made by the investigator and countersigned by the investigator's faculty advisor. That record shall be maintained and locked in the investigators home safe.

A copy of the final report of the study will be provided to you upon request prior to submission to the graduate college.

Risk of Participation:

There are no known risks associated with this study that are greater than those ordinarily encountered in daily life.

Benefits:

There are no direct benefits to the subjects of the interview. However, since each subject has a role in the aviation security system the research will ultimately benefit them by contributing to an overall increase in the level of aviation security. By providing new generations of graduates who are well versed in

aviation security matters and able to positively contribute to this vital segment of our national security both the subjects and society will ultimately benefit.

Confidentiality:

No foreseeable risks to study subjects have been identified. Measures have been identified above have been initiated by the investigator to ensure the confidentiality of each subject, interview notes, and data sets. A copy of the final report of the study will be presented to you if you so desire prior to submission to the graduate college.

Contacts:

For information regarding this study you may contact Alvin "DeWade" Langley, At 10105 Leeds Drive, Yukon, Oklahoma 73099, email: dewadel@cox.net , phone number 405.324.8005 or faculty advisor, Dr. Mary Kutz, 6108 Winfield Drive, Oklahoma City, Oklahoma 73162, email: drkutz@cox.net, 405.744.9892. For information on subjects' rights contact Dr. Sue Jacobs, IRB Chair, 219 Cordell North, Stillwater, OK 74078 405.744.1676. or irb@okstate.edu

Participant Rights:

Your participation in this study is completely voluntary. You may discontinue your participation in this study at any time without reprisal or penalty. There are no known risks associated with your withdrawal from this study.

Signatures:

I have read and fully understand the consent form. I sign freely and voluntarily. A copy of this form has been given to me.

_____ _____

Signature of the Participant Date

I certify that I have personally explained this document before requesting that the participant sign it.

_____ _____

Alvin DeWade Langley, Investigator Date

APPENDIX C

PARTICIPATION LETTER

PARTICIPATION LETTER

Dear Mr./Ms._____

I am currently working on my doctoral dissertation in the College of Adult Education, Applied Studies Aviation and Space Education, Oklahoma State University, where I am conducting research that will use aviation security stakeholder opinions to develop recommendations for collegiate aviation security programs. You have been selected to participate in the study by virtue of being a key aviation security stakeholder. I will be interviewing a number of stakeholders from government, the private sector, and academia to obtain their unique perspectives on this important issue. I would appreciate the opportunity to interview you in person (or by phone) sometime during the month of _____.

The purpose of this study is to develop recommendations for the establishment of meaningful collegiate programs that will ultimately enhance aviation security nationwide. Because the different segments previously mentioned have unique views, each has the ability to provide valuable insights that will contribute to well rounded programs with a high degree of practical applicability. Your assistance as a member of the _____sector will aid in the development of a balanced approach to aviation security resulting in a more effective aviation security system for all.

Attached are samples of the questions that will be used during the interview lasting approximately one hour. With your permission, an audiotape will be made of the interview to aid in the analysis of the data. Transcriptions of the tapes and notes will be identified by number only. The Oklahoma State University Institutional Review Board has the authority to inspect consent records and data files to assure compliance with approved procedures. Once the tapes are transcribed and the data analyzed, all tapes will be destroyed to protect confidentiality of the person being interviewed. A copy of the final report will be presented to you if you so desire, prior to submission to the graduate college. There are no known risks associated with this project that are greater than those ordinarily encountered in daily life.

I will contact you by phone on (date) to answer any questions you may have and obtain permission to interview. In the meantime, if you have any questions about the project or about me, you may contact me at 405.324.8005.

Thank you in advance for your cooperation regarding my request for assistance with this research project.

Sincerely,

A. DeWade Langley

APPENDIX D

INTERVIEW QUESTION GUIDE

INTERVIEW GUIDE

CAREER DATA:

- Describe your career history highlighting those areas that pertain to education, training, or aviation security.
- Describe your educational history.
- Describe any specific education, training, or work assignments that have dealt with security matters in general and aviation security specifically.
- Describe any experiences with aviation security and how those incidents have influenced your approach to aviation security.

AVIATION SECURITY:

1. Are you currently aware of any degree producing collegiate programs in aviation security? If so please describe the program?
2. Are you currently aware of any certification programs in the area of aviation security? If so please describe?
3. What do you consider to be the key elements of curriculum design?
4. How do those elements relate to an aviation security degree program?
5. What specific skills should be developed in students considering careers in aviation security?
6. What areas of study do you feel appropriate to develop the needed skills and knowledge bases for aviation security students?
7. In your opinion, what specific areas should be included in the core coursework for an aviation security degree program?
8. What coursework do you feel would be appropriate form other disciplines?
9. Based on your experience, what course work has been most valuable in the development of analytical skills?
10. What research opportunities do you feel exist for students studying in the field of aviation security?

11. Describe what you feel is the proper balance between technology and human resources in the field of aviation security? What coursework can aid in the establishment of that proper balance?

12. What role would you see courses in the area of risk management and decision making having in an aviation security program?

13. What coursework do you feel potential employers of aviation security students would consider to be of greatest practical value?

14. How important do you feel courses relating to global political systems and current affairs are to an aviation security program?

15. Do you feel that graduate degree programs in the field of aviation security would be beneficial to students and the industry as a whole?

16. In your opinion, is there sufficient need and interest in aviation security to warrant degree programs in this area?

APPENDIX E

DR. SLOVIC PERMISSION

Dear Mr. Langley,

I am happy to give you permission to use my figure in the ways you describe.I wish you success with your dissertation.

Sincerely,

Paul Slovic

Paul Slovic
Decision Research
1201 Oak St.suite 200
Eugene,Oregon 97401 USA
541 485 2400
www.decisionresearch.org

On Jun 8, 2007, at 7:12 AM, DeWade wrote:

Dr. Slovic,

I am currently working on my dissertation in the field of aviation security. I have found your work on risk and the perception of risk to be extremely helpful. I would like permission to use your figure "Detailed conceptual framework of social amplification of risk" It is Figure 14.2 page 240 in the 2004 reprint of your work The Perception of Risk.

I would also like your permission to adapt that figure with the September 11, 2001 attacks as the "event" and then, using your concept, work thought the amplification, ripple effects, and impacts.

Thank you in advance for your consideration. I will be anxiously awaiting your reply.

DeWade Langley
Director
Oklahoma State Bureau of Investigation

Doctoral Candidate

APPENDIX F

LISTING OF UNIVERSITIES SEARCHED FOR AVIATION SECURITY DEGREE PROGRAMS

UNIVERSITIES SEARCHED FOR AVIATION SECURITY DEGREE PROGRAMS

Alabama

Auburn University*

The University of Alabama

Alaska

The University of Alaska Anchorage

Arkansas

The University of Arkansas

Arkansas State University

Arizona

Embry-Riddle Aeronautical University*

The University of Arizona

Arizona State University*

California

Naval Postgraduate Studies

University of Southern California

The University of California Berkeley

Colorado

The University of Colorado Boulder

Colorado State University

Connecticut

The University of Connecticut

Yale University

Delaware

The University of Delaware

Delaware State University

Florida

The University of Miami

The University of Florida

Florida Institute of Technology*

Georgia

Georgia State University

The University of Georgia

Hawaii

The University of Hawaii

Idaho

The University of Idaho

Idaho State University

Illinois

The University of Illinois at Chicago

Lewis University

Indiana

The University of Indiana Bloomington

Indiana University – Purdue University Indianapolis

Indiana University – Purdue University Fort Wayne

Iowa

The University of Dubuque

Iowa State University

The University of Iowa

Kansas

Kansas State University at Salina*

University of Kansas

Kentucky

University of Louisville

The University of Kentucky

Eastern Kentucky University

Louisiana

Louisiana Tech University*

Louisiana State University

The University of Louisiana

Maine

The University of Maine

The University of New England

Maryland

The University of Maryland

Johns Hopkins University

Massachusetts

North-Shore Community College*

Northeastern University

The University of Massachusetts

Michigan

The University of Michigan

Eastern Michigan University

Western Michigan University

Minnesota

Minnesota State University Mankato

St. Cloud State University

Mississippi

Mississippi State University

The University of Mississippi

Missouri

Saint Louis University

The University of Central Missouri*

Montana

The University of Montana

Montana State University

Nebraska

The University of Nebraska

Nebraska State University

Nevada

The University of Nevada Reno

The University of Nevada Las Vegas

New Hampshire

Daniel Webster College*

The University of New Hampshire

New Jersey

Mercer County Community College*

Rutgers University

New Mexico

The University of New Mexico

New Mexico State University

New York

The University of Albany

New York University

North Dakota

University of North Dakota

North Dakota State University

Ohio

Kent State University

Ohio State University

Oklahoma

The University of Oklahoma

Oklahoma State University

Oregon

The University of Oregon

Oregon State University

Pennsylvania

The University of Pennsylvania

Pennsylvania State University

Rhode Island

The University of Rhode Island

The New England Institute of Technology

South Carolina

The University of South Carolina

South Carolina State University

South Dakota

The University of South Dakota

South Dakota State University

Tennessee

Memphis Tennessee State University

The University of Tennessee

Texas

The University of Texas College of Engineering

Texas Tech

Texas A & M

Utah

Utah State University

The University of Utah

Vermont

The University of Vermont

Norwich University

Virginia

Virginia Tech University

Hampton University*

Washington

The University of Washington

Washington State University

West Virginia

West Virginia University

West Virginia State University

Wyoming

The University of Wyoming

*Indicates institutions offering aviation security related coursework

APPENDIX G

LISTING OF COURSES RECOMMENDED BY PARTICIPANTS

COURSE RECOMMENDATIONS
(Number of Recommendations in Parentheses)

AVIATION

AVIATION INDUSTRY (1)
AVIATION MANAGEMENT (1)
AVIATION BUSINESS (1)
AVIATION LAW (1)
AVIATION LEADERSHIP (1)
AVIATION ECONOMICS (1)
AVIATION HISTORY (3)
AIRPORT MANAGEMENT (1)
AIRPORT OPERATIONS (1)
AIRPORT DESIGN (1)
PRINCIPLES OF FLIGHT (1)
ROLES AND RESPONSIBILITIES OF AVIATION AGENCIES (1)

SECURITY

ACTUARIAL RISK MANAGEMENT (1)
APPLIED SECURITY TECHNOLOGY (1)
AVIATION SECURITY (1)
AVIATION SECURITY COMPUTER SYSTEMS (1)
BUSINESS/SECURITY (1)
CAREER MANAGEMENT (1)
COLD CASE ANALYSIS COUNTER (1)
COMPUTERIZATION IN SECURITY (1)
CRIMINAL INVESTIGATION (1)
CRIMINAL JUSTICE (1)
CRIME PREVENTION (1)
CRISIS PLANNING (1)
DECISION MAKING (1)
DOMESTIC TERRORISM (3)
GENERAL SECURITY (1)
PERSONAL SECURITY (1)
PHYSICAL SECURITY (4)
PROACTIVE INTELLIGENCE (1)
PSYCHOLOGY OF TERRORISM (1)
HISTORY OF AVIATION SECURITY (1)
HISTORY OF TERRORISM (5)
INFORMATION GATHERING (1)
INFORMATION SECURITY INTELLIGENCE (9)
INTELLIGENCE AGENCIES AND INTELLIGENCE SYSTEMS (1)
INTERNATIONAL AVIATION SECURITY (1)
INTERNATIONAL TERRORISM (1)
MENTAL ILLNESS & AVIATION (2)
OPEN SOURCE INTELLIGENCE (1)
PHYSICAL SECURITY (1)
PRINCIPLES OF SECURITY (23)
PROCEDURAL SECURITY (1)
PROBABILISTIC RISK MANAGEMENT (1)
PSYCHOLOGY OF TERRORISM (1)
RISK ANALYSIS (3)
RISK MANAGEMENT (9)
RISK MITIGATION (1)
SECURITY ETHICS (2)
SECURITY LAW (1)
SECURITY MANAGEMENT (1)
SECURITY PLANNING (1)
SECURITY REGULATIONS (3)
SECURITY SYSTEMS DESIGN (6)
SECURITY TECHNOLOGY (5)
SITUATIONAL AWARENESS (1)
TERRORISM (5)
THREAT ASSESSMENT (4)

SECURITY (CONTINUED)

THREAT RECOGNITION (2)
TRENDS IN TECHNOLOGY (1)
VULNERABILITY ASSESSMENT (1)
WAR GAMING (1)
WORLD WIDE APPROACHES TO SECURITY (1)

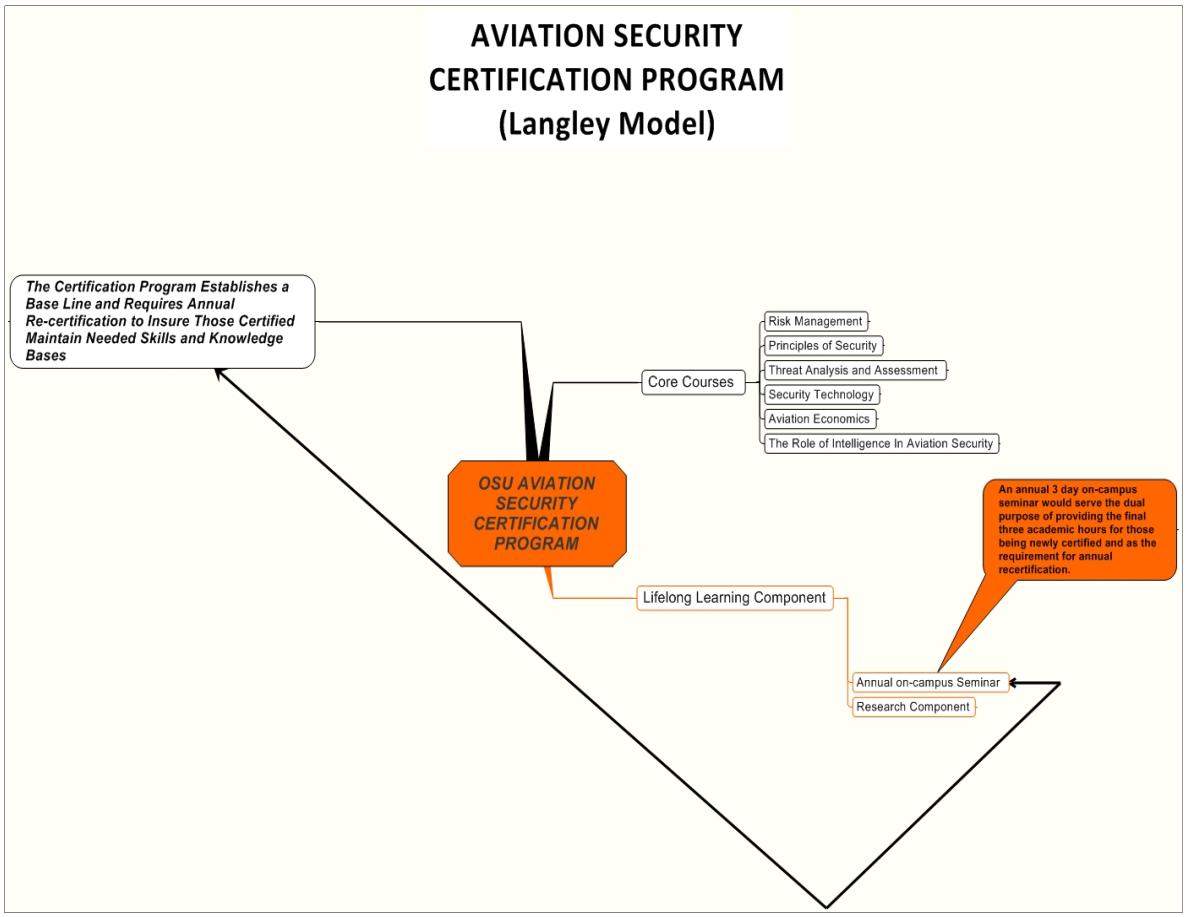
RELATED TOPICS

ANALYSIS (3)
BUSINESS ADMINISTRATION (3)
CHANGE MANAGEMENT (1)
COMPARATIVE RELIGIONS (1)
COST-BENEFIT ANALYSIS (3)
CRITICAL THINKING (3)
CULTURAL STUDIES (6)
DECISION MAKING (3)
ECONOMICS OF BUSINESS (1)
EFFECTIVE COMMUNICATION (TEACHING) (1)
ERROR CONTROL (1)
GLOBAL ECONOMICS (2)
GLOBAL STUDIES (1)
HISTORY OF INTERNATIONAL RELATIONS (1)
HOMELAND SECURITY (1)
HUMAN BEHAVIOR ANALYSIS (2)
INTER-PERSONAL COMMUNICATIONS (4)
INTERNATIONAL LAW (2)
INTERNATIONAL POLITICAL SYSTEMS (1)
INTERNATIONAL REGULATIONS (1)
INTERNATIONAL RELATIONS (1)
INTER-PERSONAL MANAGEMENT (2)1
MEDIA RELATIONS (1)
METHODS OF RESEARCH (1)
ORGANIZATIONAL CHANGE (1)
ORGANIZATIONAL CULTURE (1)
ORGANIZATIONAL INTEGRATION (1)
ORGANIZATIONAL MANAGEMENT (1)
PRACTICAL STATISTICS (1)
POLICY MAKING (1)
POLITICAL SYSTEMS (1)
PRINCIPLES OF LEADERSHIP (2)
PUBLIC RELATIONS (1)
PRIORITIZATION OF COMMUNICATIONS (1)
PROFESSIONAL DISCIPLINE (1)
RELATIONSHIP BUILDING (1)
STATISTICAL ANALYSIS (1)
SYSTEM DESIGN (1)
SYSTEMS INTEGRATION (1)
TEAM BUILDING (1)
VICTIMIZATION (1)
WORLD CONFLICT (1)
WORLD CULTURES (1)
WORLD GEOGRAPHY (1)
WORLD RELIGIONS (3)

APPENDIX H

AVIATION SECURITY CERTIFICATE PROGRAM

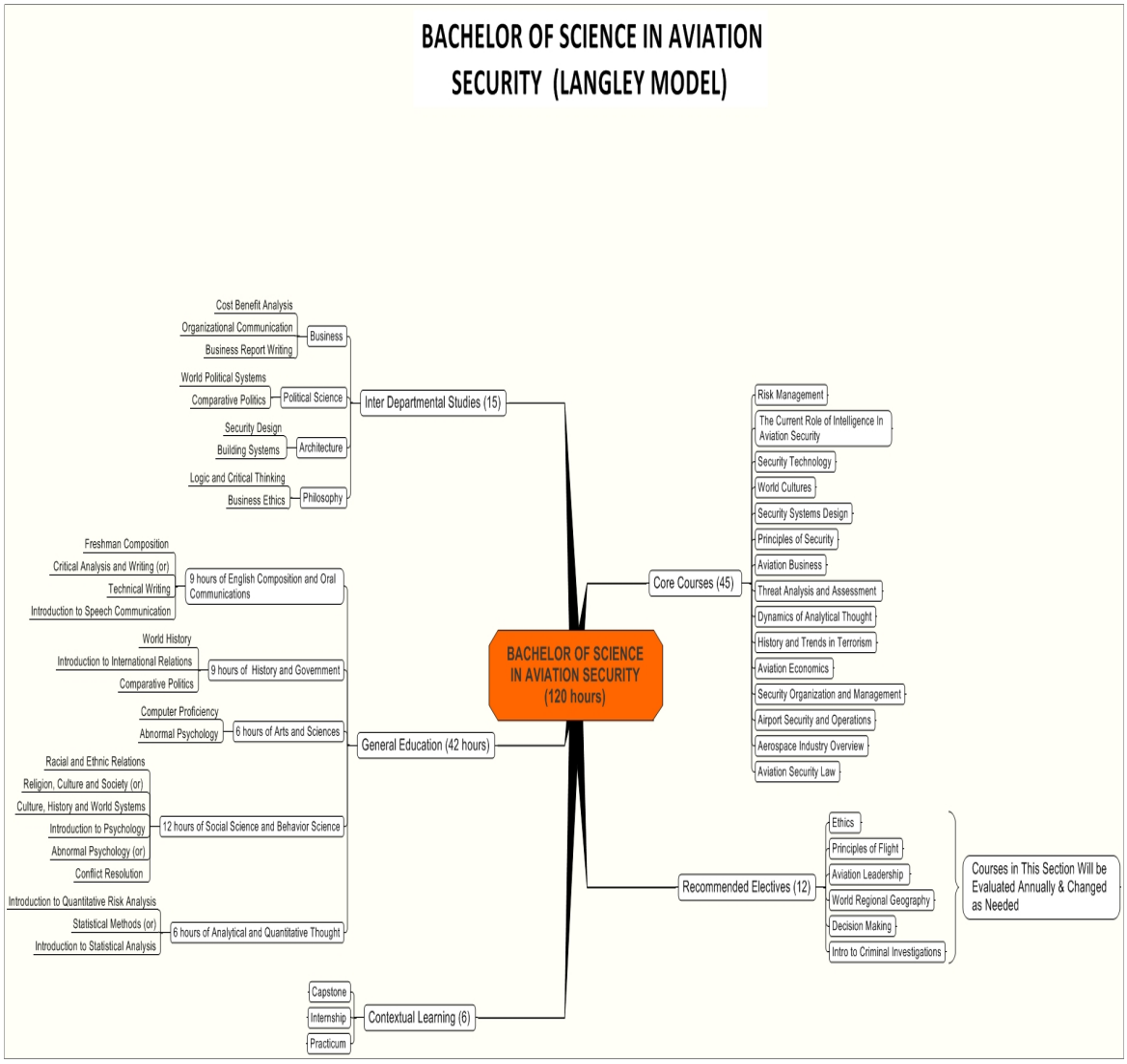
(LANGLEY MODEL)


AVIATION SECURITY
CERTIFICATION PROGRAM
(Langley Model)
The Certification Program Establishes a Base Line and Requires Annual Re-certification to Insure Those Certified Maintain Needed Skills and Knowledge Bases
Core Courses
Risk Management
Principles of Security
Threat Analysis and Assessment
Security Technology
Aviation Economics
The Role of Intelligence In Aviation Security
OSU AVIATION SECURITY CERTIFICATION PROGRAM
Lifelong Learning Component
An annual 3 day on-campus seminar would serve the dual purpose of providing the final three academic hours for those being newly certified and as the requirement for annual recertification.
Annual on-campus Seminar
Research Component

APPENDIX I

AVIATION SECURITY BACHELORS DEGREE

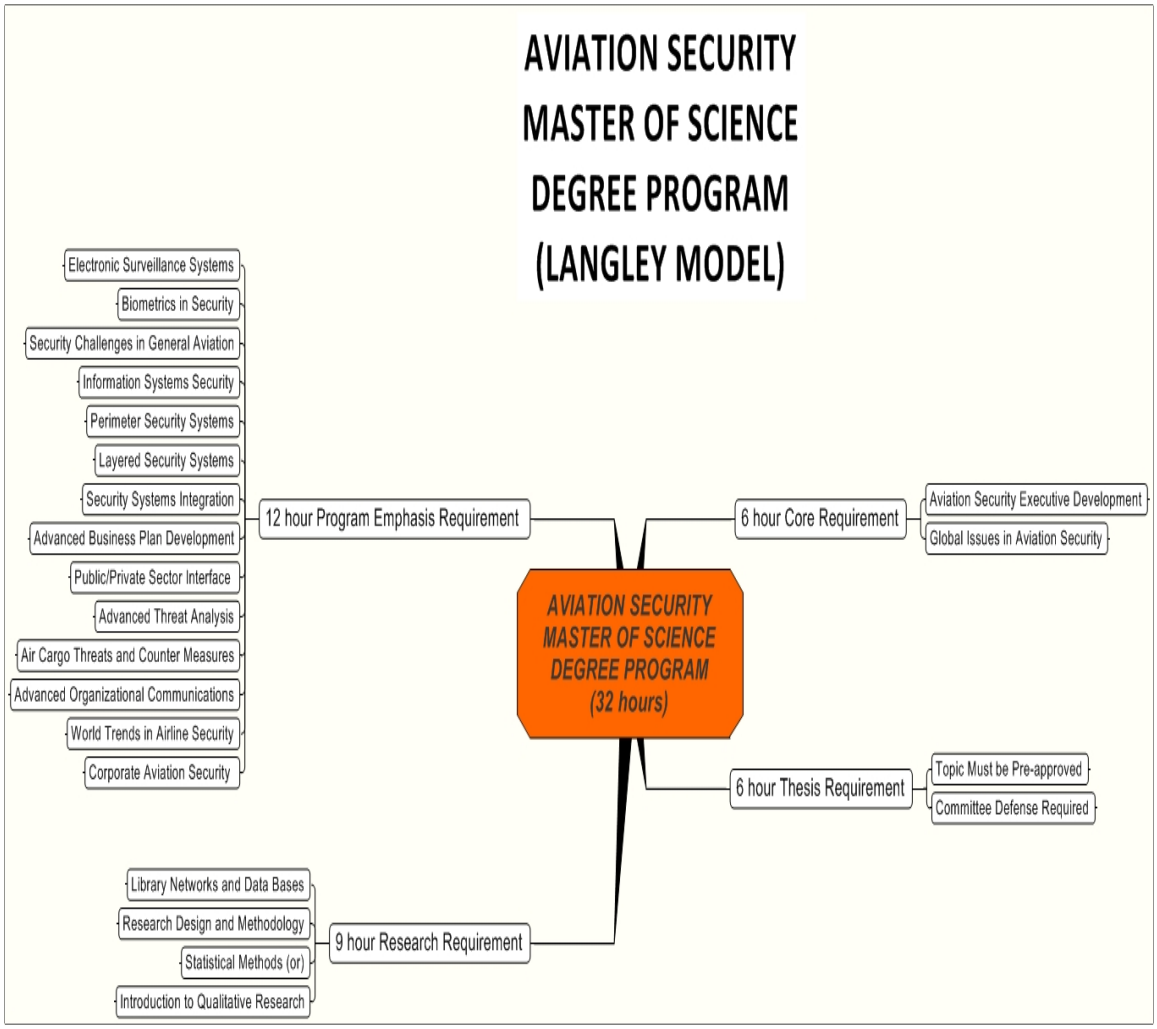
(LANGLEY MODEL)


BACHELOR OF SCIENCE IN AVIATION SECURITY (LANGLEY MODEL)
BACHELOR OF SCIENCE IN AVIATION SECURITY (120 hours)
Inter Departmental Studies (15)
Business
Cost Benefit Analysis
Organizational Communication
Business Report Writing
Political Science
World Political Systems
Comparative Politics
Architecture
Security Design
Building Systems
Philosophy
Logic and Critical Thinking
Business Ethics
General Education (42 hours)
9 hours of English Composition and Oral Communications
Freshman Composition
Critical Analysis and Writing (or)
Technical Writing
Introduction to Speech Communication
9 hours of History and Government
World History
Introduction to International Relations
Comparative Politics
6 hours of Arts and Sciences
Computer Proficiency
Abnormal Psychology
12 hours of Social Science and Behavior Science
Racial and Ethnic Relations
Religion, Culture and Society (or)
Culture, History and World Systems
Introduction to Psychology
Abnormal Psychology (or)
Conflict Resolution
6 hours of Analytical and Quantitative Thought
Introduction to Quantitative Risk Analysis
Statistical Methods (or)
Introduction to Statistical Analysis
Contextual Learning (6)
Capstone
Internship
Practicum
Core Courses (45)
Risk Management
The Current Role of Intelligence in Aviation Security
Security Technology
World Cultures
Security Systems Design
Principles of Security
Aviation Business
Threat Analysis and Assessment
Dynamics of Analytical Thought
History and Trends in Terrorism
Aviation Economics
Security Organization and Management
Airport Security and Operations
Aerospace Industry Overview
Aviation Security Law
Recommended Electives (12)
Ethics
Principles of Flight
Aviation Leadership
World Regional Geography
Decision Making
Intro to Criminal Investigations
Courses in This Section Will be Evaluated Annually & Changed as Needed

APPENDIX J

MASTER OF SCIENCE IN AVIATION SECURITY

(LANGLEY MODEL)


AVIATION SECURITY MASTER OF SCIENCE DEGREE PROGRAM (LANGLEY MODEL)
AVIATION SECURITY MASTER OF SCIENCE DEGREE PROGRAM (32 hours)
12 hour Program Emphasis Requirement
Electronic Surveillance Systems
Biometrics in Security
Security Challenges in General Aviation
Information Systems Security
Perimeter Security Systems
Layered Security Systems
Security Systems Integration
Advanced Business Plan Development
Public/Private Sector Interface
Advanced Threat Analysis
Air Cargo Threats and Counter Measures
Advanced Organizational Communications
World Trends in Airline Security
Corporate Aviation Security
6 hour Core Requirement
Aviation Security Executive Development
Global Issues in Aviation Security
6 hour Thesis Requirement
Topic Must be Pre-approved
Committee Defense Required
9 hour Research Requirement
Library Networks and Data Bases
Research Design and Methodology
Statistical Methods (or)
Introduction to Qualitative Research

VITA

Alvin DeWade Langley

Candidate for the Degree of

Doctor of Education

Thesis: A QUALITATIVE INQUIRY OF STAKEHOLDER RECOMMENDATIONS FOR COLLEGIATE AVIATION SECURITY CURRICULA

Major Field: Applied Educational Studies

Biographical:

Personal Data: Born Clinton, Oklahoma, April 9, 1950, the son of Mr. and Mrs. Woodrow Wilson Langley.

Educational: Graduated from Clinton High School in May of 1969; received Bachelor of Science Degree in Law Enforcement from Northwestern Oklahoma State University, May 1977; received a Master of Natural and Applied Sciences from Oklahoma State University, May 2004; completed requirements for a Doctor of Education degree in Applied Educational Studies, Aviation and Space, from Oklahoma State University, December 2007.

Professional Experience: Director, Oklahoma State Bureau of Investigation 1995 to present; Deputy Director Oklahoma State Bureau of Investigation 1990-1995; Special Agent Oklahoma State Bureau of Investigation 1977-1995; Unit Leader Tri Agency Narcotics Unit 1972-1977; Retired Command Sergeant Major United States Army National Guard.

Teaching Experience: Guest Lecturer Public Safety University, Bejing China, 1991; Leadership and Law Enforcement Management Instructor National Police, Command Staff, Tirana, Albania, 2001. Adjunct Instructor at Oklahoma State University, Stillwater; Oklahoma State University, Oklahoma City; University of Central Oklahoma, Oklahoma City; East Central University, Ada, Oklahoma; and Southwestern Oklahoma State University, Weatherford, Oklahoma.

Name: Alvin DeWade Langley Date of Degree: December, 2007

Institution: Oklahoma State University Location: Stillwater, Oklahoma

Title of Study: A QUALITATIVE INQUIRY OF STAKEHOLDER RECOMMENDATIONS FOR COLLEGIATE AVIATION SECURITY CURRICULA

Pages in Study: 220 Candidate for the Degree of Doctor of Education

Major Field: Applied Educational Studies (Aviation)

Scope and Method of Study: Aviation Security Stakeholder Qualitative Interviews.

The current world environment and the challenges of the future demand an efficient and effective aviation security system. Development of intellectual capital to support that system must be based on strong academic curricula grounded in the life experiences and academic pursuits of its current stakeholders across three distinct disciplines: security, aviation and education. The purpose of this study was to develop a set of stakeholder driven recommendations for aviation security certification, degree programs, and specific curricula. Three broad research questions supported the findings of this study related to stakeholder recommended skill sets, core knowledge bases, and specific course work for collegiate aviation security programs. A purposive sample of 14 stakeholders from a variety of international aviation security professions was selected for interview using an Interview Guide of 16 questions. The data was analyzed using Hyper-Research software. Connections were made between common disciplines, themes, and linkages.

Findings and Conclusions:

Skills sets predominantly identified by the majority of stakeholders fell into one of three broad categories: thinking, communication, or relationship skills. Recurring themes in the study surfaced the importance of incorporating risk management, interpersonal communications, business concepts, global perspectives, cultural studies, and analytical thinking not only to degree programs but to be woven into the fabric of specific coursework. Program design considerations which surfaced in the study included*: flexibility* to maintain currency in the industry; *accessibility* through online, distance learning and hybrid course formats; *lifelong learning* or continuing education components to keep certificates and degrees current in a rapidly changing field.

Recommendations of the study were based on growth in projected demand and included three Langley models: Aviation Security Certification Program, Aviation Security Bachelor of Science Degree; and the Aviation Security Master of Science Degree Program. A number of additional recommendations were offered based on stakeholder comments related to funding, grants, and future research.

ADVISOR'S APPROVAL: _____