

EVALUATING AN ACTIVE SHOOTER CURRICULUM FOR INSTITUTIONS OF HIGHER LEARNING

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Submitted to the Graduate Faculty of
University of Pittsburgh in partial fulfillment
of the requirements for the degree of
Doctor of Education

University of Pittsburgh

2015

UNIVERSITY OF PITTSBURGH

SCHOOL OF EDUCATION

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**EVALUATING AN ACTIVE SHOOTER CURRICULUM FOR INSTITUTIONS OF
HIGHER LEARNING**

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University of Pittsburgh, 2015

The increased incidents of school shootings at Institutions of Higher Learning (IHLs) in the United States have become a great concern for school administrators and law enforcement officials. This literature review presents a) lessons learned from preparing IHLs for an active shooter event, b) alternative measures to support IHLs in managing an active shooter event, c) alternative active shooter training for IHLs. An examination of the literature review provides the definition of what is considered an “active shooter incident” and provides evidence for the increased occurrences of active shooter events at IHLs. Lessons learned from active shooter incidents are discussed, and various security alternatives to mitigating and responding to an active shooter crisis are investigated.

The evidence presented in this research makes it clear that IHLs can no longer depend solely on outside agencies to protect them from active shooter incidents. In fact, IHL employees will respond before law enforcement arrives. Though a great deal has been written about the experiences of first responders and IHL employees in active shooter incidents, much remains to concern us. First, agencies and IHLs differ considerably, and their differences contribute to confusion at the scene. Secondly, individuals at IHLs and responders are not clear about their roles and interactions. In fact, being together at a scene does not guarantee teamwork leading to

an effective response. Thirdly, educators and responders who do not train together cannot partner effectively in a crisis.

Without a shared training program to prepare properly for an active shooter attack, IHLs remain at serious risk. The increase in attacks alone should alert IHLs to the necessity of preparing and training staff personnel for an active shooter encounter. However, there is still no standardized joint training for responders and IHL faculty and staff in the United States.

Institutions of Higher Learning need to support the law enforcement community in providing a standardized curriculum to protect the campus environment and its interest. This review, by examining active shooter events and training in detail, could inform such training. For this reason, this study explores various methods that IHLs can use to prepare, mitigate, and respond to an armed intruder on a college campus.

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PREFACE

I would like to first thank God who provided the strength and encouragement for me to begin and complete this research journey, which has the potential to benefit institutions of higher learning in saving innocent lives. It was God who gave me life, and I desired to give back to humanity to fight against senseless terrorist acts. Moreover, I give thanks to my church family, who have been instrumental in this walk and have been praying for me endlessly throughout this process.

Next, I would like to thank my parents, who have always been supportive and understanding throughout all of my adventures. They have demonstrated to me core values such as integrity, love, selfless service, and staying in touch with family. Most importantly, I thank my immediate family members, who gave me the will power to continue in my studies even though it took me away from spending quality time with them. Now that this work has come to an end, I look forward in spending more time with Kyra, Karlton, Kami, Karmen, Tashawn, and Shawn.

I am also fortunate to have close friends, and while space does not allow me to name them all, I thank them for the ridiculous requests of staying up late with me and providing me with something nourishing to eat to keep me going. I look forward to replicating their kindness.

The professional assistance that I had through this process was tremendous. Working with Caiyan Zhang, Sarah Dugan, and James Loftus provided additional support and advice through my dissertation process.

My committee's scholarly efforts, expert advice, thought-provoking questions, and willingness to share their research experiences proved to make the difference in this study. Dr. Ernie Fullerton has always been and continues to be my mentor on law enforcement issues. He has provided and assisted me with insight regarding problematic matters in law enforcement. Dr. Charlene Trovato expanded my perspectives regarding my theoretical framework and was always available upon my request. Dr. Stewart Sutin shared his time and expertise in higher education leadership and management and was able to assist me on selecting a research topic that interested me. Finally, I would like to express my appreciation to Dr. Mary Margaret Kerr for her commanding presence, encouragement, and guidance throughout this process. Our work over the past three years has allowed me to expand my role from being a law enforcement administrator and instructor to also being a practitioner and expert on active shooter issues, emergency management, and planning. It is my intention to carry on our work in support of institutions of higher learning.

1.0 INTRODUCTION

It is my true desire and intent to assist those working in an educational environment in developing strategies and relationships for the purpose of identifying, preparing, planning, implementing, mitigating, and responding effectively and efficiently to emergencies and threatening situations. Armed with effective strategies, in a case where an active shooter enters onto an Institution of Higher Learning (IHL) campus to cause mayhem among university students, school officials, and the public, the university and its collaborating organizations will be able to respond effectively to the crisis.

This research subject derived from the recent increase of active shooter incidents occurring at IHLs and reports of schools not prepared to handle such emergencies nor respond to critical incidents. The Kelly Report (2012) shows the number of armed intruders on school campuses have increased. Table 1 illustrates the number of incidents by location. The table shows that less than one-third of the active shooter incidents (230) occurred at 279 locations, because several attacks involved more than one location (Kelly, 2012, p. 8).

Table 1. *The Number of Incidents by Location*

Type of Location	Number of Incidents	Percentage
Schools	68	24%
Office Building	31	11%
Open Commercial	67	24%
Factory/Warehouse	33	12%
Other	80	29%
Total	279	100%

As a member of a law-enforcement team at an IHL, I have experienced first-hand situations where terroristic threats and attacks have placed the institution’s administrators, faculty, staff, and students in a vulnerable state, thus affecting its daily operations. On March 8, 2012, the University of Pittsburgh experienced terroristic threats that disrupted classes, exams, vehicular and public transportation, and athletic events. On February 12, 2012, a bomb threat was discovered on a wall at the University of Pittsburgh campus. The letter stated that a bomb would go off in the evening hours. As a precautionary measure, the building was evacuated and searched by agencies throughout the region (Mandak & Begos, 2012). I have observed during these situations that many institutions lack professional relationships, resources, and an understanding of how to respond successfully to a school crisis.

The Columbine shooting on April 20, 1999, is an example of why this research was highly pursued. During this incident, two attackers opened fired on their school killing 13 people and injuring 24 others (Kelly, 2012, p. 121). The first responders responded to the active shooter scene and stood by while homicidal acts were taking place in the school. The lack of relationships, training, and communication among agencies was evident during the crisis (Trump, 2009, p. 29). The first responders were not aware of who was in charge of the scene and waited for instructions from anyone who would take charge. It took the first special emergency response team (SERT)

over four hours before they enter the school. Despite the importance of being prepared, why do schools lack professional relationships with outside agencies and forgo the importance of implementing emergency plans and training to assist schools in responding and mitigating critical incidents?

The lack of emergency response and preparedness during an active shooter incident at educational institutions serves as the rationale for conducting this study. Lack of proper training of school personnel can add to increased fatalities, loss of property, and disrupt the campus environment. Personal observations from previous crisis incidents show that emergency and educational agencies' inability to build relationships, communicate, or train together prior to a crisis negatively impacts a critical event. If institutions are not training together, they are unfamiliar with each agency's insufficiencies. For example, responding agencies need to have continuous communication among first responders to provide pertinent information about the crisis incident. If incorrect information is transmitted to the first responders, the crisis scene may become chaotic and unmanageable because the first responders are unaware of the crisis situations. Similarly, if first responders are not aware of the proper radio frequency to monitor, responding agencies are not receiving up to date information that is required to resolve the crisis (Macleod, n.d.).

The lack of relationships and training can be devastating to IHLs infrastructure when a holistic approach to managing critical incidents is not achieved before a crisis. Managing an active shooter incident takes a multijurisdictional response. Training with other agencies in the incident command system (ICS) and the unified command structure builds relationships and provides opportunities for leaders to share their institutions' strengths, weaknesses, and accessible resources

during a crisis (Federal Emergency Management Agency, n.d.). The above-mentioned active shooter training should be mandated annually at IHLs.

Schools who have not re-evaluated their emergency plans and response to an active shooter incident by first responders and school personnel need to consider the consequences of an active shooter episode if the proper plan and response by school personnel is not in place. First responders can no longer respond to an active shooter attack and wait for enough resources to be in place before they attempt to neutralize the shooter's actions (Standford, 2014). School staff can no longer tell students to hide in areas of the school that will not protect them from bullets fired at them. The law enforcement and campus communities are affected when an intruder invades a college campus. The school is either in lock down or shelter in place mode, the adjacent community is evacuated, and intersections and streets are shut down (Standford, 2014). With the law enforcement community seeing educational institutions across the nation affected by these types of threats and experiences, and experiencing responses that are inappropriate or substandard, an investigation into how to improve this situation is crucial.

The following section, the literature review, explores how higher educational institutions currently train, manage, prepare, and mitigate threats towards their facilities to provide a clear picture of the existing situation. It examines the history of higher education shootings and the methods through an examination of three related questions: 1.) What method of training have institutions of higher learning provided for faculty and staff during an active shooter or intruder situation? 2). How do higher educational institutions currently prepare for active shooter incidents? 3). What is the significance of having a good working relationship among first responders and university personnel during a critical incident?

The literature review presents background information on past active shooter incidents at IHLs and an examination of the lack of preparation and training which led to the tragic results of these incidents. I then present an analysis of the lessons learned from these incidents.

The literature review contains three sections. The first part explains key terms in the field of law enforcement. The next section addresses the question, “What is the history of higher education shootings?”

History records from August 1966, to April 2012, reveal a total of 86 school shooting incidents in the world. Out of this number, 24 were university shootings (Kelly, 2012, p. 92-144). Charles Whitman committed the first recorded active shooting at an IHL. On August 1, 1966, the actor committed mayhem in Austin, Texas, at the University of Texas, where he went on a 96-minute shooting spree. Many, including the media, called him the Texas Bell Tower Sniper. He committed homicidal acts against 17 people and wounded 32 others (Macleod, n.d.). This incident motivated universities to begin thinking about how to prepare and plan for emergency response and evacuation.

The third section explores what the literature reveals about the relationships between law enforcement and educators in active shooter incidents. Partnerships between IHLs and emergency responders benefit both parties during a crisis incident. The literature identifies reasons why relationships are crucial pre, during, and post-response. For instance, when organizations lack an understanding of each other’s authority and responsibilities during a crisis situation, there is greater risk of loss of life, property, and resources.

Lastly, given what we know about active shootings in United States IHLs, such as the breakdown in communication chains, poor response times, and of times failure to preserve life, it is clear that employees need to be properly trained for such incidents. Therefore, the final section

of the literature review explores various strategies focusing on training curriculums and implementation prior to an active shooter situation.

2.0 LITERATURE REVIEW

2.1 DEFINITIONS AND ACRONYMS

When studying subjects such as law enforcement and Institutions of Higher Learning (IHLs) it is important to identify a list of terms, acronyms, professional organizations, and ideas that may be unfamiliar to the audience. Table 2 provides key words that are referenced throughout this dissertation.

Table 2. Definitions

Term	Definition
AAR	After action review (United States Army, n.d.)
CERT	Campus Community Emergency Response Team
CLERY Act	The federal Jeanne CLERY Disclosure of Campus Security Policy and Campus Crime Statistics Act (CLERY Act) requires Institutions of Higher Learning, both public and private, participating in federal student aid programs to disclose campus safety information and imposes certain basic requirements for handling incidents of sexual violence and emergency situations. Disclosures about crime statistics and summaries of security policies are made annually in an Annual Security Report (ASR), and information about specific crimes and emergencies are made publicly available on an ongoing basis throughout the year (Cartger, 2013).
DHS	Department of Homeland Security - the department of the U.S. federal government charged with protecting U.S. territory from terrorist attacks and providing a coordinated response to large-scale emergencies (Department of Homeland Security, 2014). The Department of Homeland Security mission is to keep out nation safe from the multiple threats we face. This requires the commitment of multiple personnel in jobs that range from aviation and border security to emergency response, from cybersecurity analyst to chemical facility inspector. DHS duties are widespread, and their goal is clear - keeping America safe (Department of Homeland Security, 2014).
ENS	Emergency Notification System
EOD	Explosive Ordinance Devices
Epicenter of violence	The point and time at which the onset of the violent incident occurs and from which the active shooter's actions radiate outward. The epicenter of violence must already exist in order for any reactive response to occur. The epicenter of violence is also the most dangerous location to be in as the incident generally starts with little warning to facilitate a defensive reaction (D. Papale, personal communication, March 15, 2013).
ERO	Education Resource Officer
FEMA	Federal Emergency Management Agency
ICS	Incident Command System

Table 2 (continued)

ICT	Incident Command Team
IMT	Incident Management Teams
IED	Improvised Explosive Device
IHL	Institution of Higher Learning
MOU	Memorandum of Understandings
NIMS	National Incident Management System
PIO	Public Information Officer
SRO	School Resource Officers
SERT	Special Emergency Response Team
Targeted areas	Referred to as soft targets, these locations are usually schools, malls, churches, and public venues (NTOA, personal communication, June 10, 2012).
Terrorist	A person(s) who premeditate and commit a homicidal act towards individuals or groups who do not share the same ideology, political views, or religion
Terrorist act	An homicidal act that threatens individuals or a group for the sole purpose to influence an audiences' ideology, political views, or religion
Threat assessment	An investigation of an individual or group who has communicated a threat or engaged in some kind of threatening or intimidating behavior. The threat maybe communicated in a number of ways, such as verbally by, email, letter, through a third party, or by website transmission (Cornell, 2010, p. 10).
UPMC	University of Pittsburgh Medical Center
UPPD	University of Pittsburgh Police Department

Source: Reprinted with permission from National Tactical Officers Association, July 23, 2015

In order to identify appropriate training to prepare school personnel to respond to an active shooter event, we must first examine lessons learned from other incidents. Accordingly, the next section explores lessons learned from experts in the field of law enforcement.

2.2 LESSONS LEARNED PREPARING INSTITUTIONS OF HIGHER LEARNING (IHLS) FOR ACTIVE SHOOTER EVENTS

The Department of Homeland Security (DHS) defines an active shooter as “an individual actively engaged in killing or attempting to kill people in a confined and populated area” (Kelly, 2012, p. 1). An examination of the literature brings to light multiple reasons why government and law enforcement agencies should research and release findings on active shooter incidents in the United States. One of the reasons is to identify past practices to evaluate their effectiveness through expert analysis (Simons, 2014).

Institutions of Higher Learning (IHLS) are well known for conducting fire alarm drills and educating staff in preparation for a natural disaster. However, most IHLS have not trained or prepared for an active shooter encounter. Experts have recorded that an active shooter attack is dynamic and can vary greatly from one attack to another. A private study of 35 active-shooter incidents during 2012 found that the average time of an active shooter incident lasts 12 minutes, with 37 percent lasting less than 5 minutes and 63 percent in less than 15 minutes (Blair, Martaindale, & Nichols, 2014).

The literature reveals that campus active shooting occurrences are low in frequency but, at the same time, have a high impact at IHLS (Simons, 2014). An active shooter episode has the potential to cause chaos and disruption on campus. This chaos includes cancellation of classes,

exams, athletic events, and/or graduation ceremonies, and can have an effect on student enrollment. Schools have recognized the inordinate length of response time of first responders and agree that past emergency practices must change. Past active shooter events demonstrate that immediate responses by first responders have proven to be inadequate to mitigate an active shooter incident. Regardless of the first responders' response time, many innocent victims are fatally wounded. Blair, Martaindale, and Nichols (2014) analyzed police response times for 51 active shooter incidents that occurred from 2000 through 2010. The median response time was 3 minutes, which is exceptional by law enforcement standards.

However, despite the excellent response times, a lack of staff training often leads to devastating active shooter events.

On February 12, 2010, Amy Bishop, an assistant professor of biological science at the University of Alabama, opened fire in a faculty meeting, killing three people and wounding three others after reportedly being denied tenure (Gates, 2010). Five of the victims were members of the faculty and the sixth was an employee of the university (Kelly, 2012, p. 99). The assailant was arrested outside of the building several minutes after the incident, but the incident did not end as a result of any action on the first responders' part. Instead, the assailant's weapon, which was pointed at the dean of the university's graduate program, misfired. The dean then approached the attacker and asked her to stop; she complied and left the room (Bartlett, Wilson, Basken, Glenn, & Fischman, 2010). During the above episode, no one attempted to evacuate or fight the assailant, which demonstrates the lack of training by school personnel.

Apparently, there are gaps in the field of not providing active shooter training to IHLs personnel. The above example demonstrates the effects of a university not responding appropriately to an active shooter situation. The incident caused disruption to the institution and

lives were lost. To eliminate the gaps in the field a mandatory active shooter curriculum should be adopted by the Department of Education, and requiring IHLs to participate in annual active shooter training for administrators, faculty, and staff.

Increasingly, we are learning that school officials and staff must have the ability to intervene in an active shooter incident to save lives and bring resolution to a crisis event. If administrators and staff personnel do not train and prepare for an active shooter event, when a crisis occurs they will not know how to respond. The recent lessons learned from active shooter episodes have shown that there has been an increase in active shooter incidents in the United States. Blair, Martaindale, and Nichols (2014) also investigated the of active shooter events from 2000 through 2012. The frequency of events escalated from nearly one episode bi-monthly in 2000 through 2008 to one episode monthly between 2009 and 2012. This research shows the increase in the number of victims shot and number of people killed for the years from 2009 to 2012.

Admittedly, IHLs have learned lessons from previous crisis incidents and made changes to their emergency response plans to incorporate lock down and evacuation procedures, emergency notification systems, and trainings sessions on how and when to run, hide, or fight. For example, the University of Pittsburgh added social media websites for notifying the campus community of imminent and real time emergencies. However, the literature demonstrates that emergency response plans do not often include active shooter training. The New York City Police Commissioner Raymond W. Kelly previously published a report in 2010 for law enforcement personnel (Kelly, 2012). In 2012, an updated version was released in the wake of more recent active shooter incidents that have terrorized the nation's IHLs because active shooter incidents are becoming more frequent. The most recent report includes a detailed analysis of each active shooter

incident that transpired from July 1976 through December 2012 (Kelly, 2012). Table 3 records active shooter incidents that have occurred at IHLs since 2012.

Below, in reverse chronological order, is a historical account of eighteen university/college shooting incidents since the first recorded one in 1966. A summary of each event, excerpted from Kelly’s 2012 report (p. 92-144), is provided as well.

Table 3. *Institutions of Higher Learning Shootings Since 2012*

Year of Event	Assailant	Age	Account of the Event
April 2, 2012	One Goh	43	Goh opened fire at Oikos University, murdering seven students and wounding three others. Goh, a previous student at the school, at first sought to target an administrator against whom he harbored a grudge.
September 27, 2010	Colton Tooley	19	Tooley opened fire in a maintenance building on the University of Texas close to where Whitman’s deadly shooting rampage took place in 1966. Outside of Tooley committing suicide, there were no other fatalities.
March 9, 2010	Nathaniel Brown	51	Brown, a custodian at Ohio State University, opened fire in the facility, killing one co-worker and injuring another. He then committed suicide. Brown had been informed that he would be fire.
February 12, 2010	Amy Bishop	44	Bishop, an assistant professor of biological science at the University of Alabama, opened fire in a faculty meeting, murdering three people and wounding three others after reportedly being denied tenure. Five of the victims were members of the faculty and the sixth was an employee of the university.
April 26, 2009	Odane Maye	18	Maye, a former student at Hampton University, opened fire at a Hampton University dormitory, wounding a pizza delivery man and the dormitory manager. Prior to the shooting, Maye parked his vehicle off campus to avoid a vehicle checkpoint. Following the shooting Maye attempted to commit suicide.

Table 3 (continued)

February 14, 2008	Steven Kazmierczak,	27	Kazmierczak, a former graduate student at Northern Illinois University, opened fire in a university lecture hall, killing five people. Kazmierczak carried his weapons onto the campus in a guitar case, stepped from behind a screen on the stage, and began firing at students.
February 8, 2008	Latina Williams	23	Williams, a student, opened fire in a classroom at Louisiana Technical College in Baton Rouge, killing two students.
September 21, 2007	Loyer Braden	18	Braden, a student at Delaware State University, opened fire in the campus dining hall, killing one student and injuring another.
April 16, 2007	Seung-Hui Cho	23	Cho, a Virginia Polytechnic Institute student, opened fire inside a university dormitory and in several classrooms, killing 32 people and wounding 20 others. He committed suicide after the attack. Cho reportedly had a history of mental and behavioral problems.
May 9, 2003	Biswanath Halder	62	Halder opened fire at a Case Western Reserve University building, killing one person and wounding two others. The attack lasted seven hours. Reports state that Halder was upset because he believed a university student hacked into his web site.
October 29, 2002	Robert Flores	41	Flores, reportedly a failing student, opened fire in an instructor's office at the University of Arizona Nursing College, killing three of his instructors.
October 21, 2002	Huan Xiang	36	Xiang, a fourth year honor student opened fire in a Melbourne University classroom, killing two students and wounding five others. Reports state that before firing, Xiang, stood on his desk, pointed his gun at students and yelled, "You never understand me."
January 16, 2002	Peter Odighizuwa	43	Odighizuwa, a graduate student who reportedly was angry after being dismissed, opened fire on the campus of the Appalachian School of Law, killing the dean, a student, and a professor, and wounding three other people.
May 17, 2001	Donald Cowan	55	Cowan, a non-affiliate, opened fire at a Pacific Lutheran University dormitory, killing a music professor. Cowan left a 16-page suicide note expressing anger at a colleague of the victim, whom Cowan briefly dated as a teenager.

Table 3 (continued)

December 14, 1992	Wayne Lo	18	At Simon’s Rock College of Bard in Great Barrington, Massachusetts, student Wayne Lo opened fire on campus, killing two people and wounding four others including a security guard, professor, and students in the library and dormitories. Prior to the attack, school administrators were notified that Lo had received a package from an ammunition company but determined the school had no authority to interfere with the package. Additionally, the school resident director was warned that Lo had threatened to kill her and her husband.
November 1, 1991	Gang Lu	28	Gang Lu, a graduate student, opened fire on the University of Iowa campus, killing five people and wounding another. Lu’s victims included two professors, a department chair, an associate professor, an associate vice president, and a student employee. Reports state that Lu was angry over the unenthusiastic reception his dissertation received. Investigators recovered letters in which Mr. Lu enumerated a list of targets and outlined his plans to exact revenge.
July 12, 1976	Edward Allaway	37	Allaway, a custodian at California State University in Fullerton California, opened fire in the basement of a library killing seven people and wounding two others. Allaway then called the police and surrendered.
August 1, 1966	Charles Whitman	24	Whitman, an architectural engineer student, opened fire from an observation desk on the University of Texas campus, killing 13 people and wounding 31 others. Whitman’s attack ended after he was shot by a police officer.

2.2.1 “Epicenter of Violence”

With proper training on how to respond to an active shooter incident, the number of casualties can be reduced. A key element of training should be an understanding of the “epicenter of violence.” Prior literature has shown active shooter perpetrators select the location where they will commit terrorist acts. The assailants cannot predict the area of the epicenter of violence because they are

not aware of where people are located. The epicenter of violence is the most dangerous location to be in because it is populated with many people. The epicenter of violence generally starts with little warning to facilitate a defensive reaction (D. Papale, personal communication, March 29, 2012).

The assailant selects a location to commit homicidal acts by seeking areas that have vulnerable people that are unable to protect or defend themselves against an active shooter. Once the attacker opens fires on defenseless people, the volatile area becomes the epicenter of violence. During the Virginia Tech shootings on April 16, 2007, the attacker selected an academic building where many students and professors were preparing for class. The attacker had previous knowledge that there might be students in the area because he also took classes in that building.

An active shooter considers, plans, and prepares before engaging in acts of violence, sometimes even two days before the event (Vossekuil, Fein, Reddy, Borum, & Modzeleski, 2002). The behaviors are often obvious, providing school personnel an opportunity for disruption of the intended violence by using a comprehensive, multi-disciplinary approach to assessment and intervention (Vossekuil et al., 2002; Department of Defense, 2012).

The response to an active shooter incident should take into account a number of factors; however, the greatest single factor usually will be how close responders are to the epicenter of violence. The greater the distance responders are from the epicenter of violence means the more time they have available to react to the situation, which provides alternatives for responders to decide a course of action. Table 4 provides The National Tactical Officers Association (2013) suggested actions that school personnel can select based on their proximity to the epicenter of violence during an active shooter situation. An explanation of each course of action follows.

Table 4. *Possible Actions Responders Can Take Based on Proximity to the Epicenter of Violence*

a) Emergency defense	b) Barricade
c) Evacuate	d) Use inherent security in design (locks, door designs, door jams, electronic locks, rope ladders, etc.)
e) Cover and/or Conceal	f) Create alternate escape path
g) Layers of security	h) Address special needs concerns

Source: Reprinted with permission from National Tactical Officers Association, July 23, 2015

a) Emergency defense involves individuals using objects (classroom furniture, etc.), computers, or materials (books, staplers, etc.) available to defend themselves. These items should be propelled at the assailant to distract him or her from continuing to harm individuals. This response is predicated on whether other options to escape or hide from assailant(s) are impossible.

If no other options to defend self or others exist, individuals will have to fight to survive (NTOA, personal communication, June 10, 2012).

In order for individuals to react to threatening situations, training and exercises are paramount to mitigating a crisis. One method to train school personnel is to conduct tabletop exercises intended to examine the hypothetical ability of a group to react to an emergency situation. Tabletop exercises put individuals in the mindset to respond and act during a threatening situation. Table 5 describes a decision-making process, the OODA Loop model that gives responders the best chance to respond and react rapidly to an active shooter situation. The OODA Loop, developed by retired United States Air Force fighter pilot Colonel John Boyd, is a four-stage process that individuals experience when facing a threatening event (Scott, 2009).

Table 5. OODA Loop Thought Process

OBSERVE: The threatened individual sees the threat or possible threat appear and acknowledges there is something he/she may have to respond or react to.

ORIENT: The threatened individual recognizes the threat and processes possible courses of action, whether to run, hide, or fight.

DECIDE: The threatened individual selects the best course of action. Depending on the crisis and location of the epicenter of violence, the individual quickly decides what to do. There are only seconds to decide how to respond.

ACT: The individual executes the selected course of action.

The OODA Loop thought process repeats the cycle after the assailant's reaction to each action of the individual. In essence, the responder and the active shooter are both experiencing the OODA Loop thought process.

b) To barricade is to provide individuals with a defensive shelter. A barricade can be as simple as locking a door inside a classroom. Usually, personnel in the room quickly identify items within the confined area during an active shooter attack, such as office or classroom furniture, tables, chairs, or bookcases. Any objects that can impede the assailant's entry into the room should be used for the barricade. This course of action may be chosen if individuals do not have an avenue or path to escape from the immediate threat. To delay an assailant's entry into an office space or classroom, barricading the entryway is the preferred resolution (NTOA, personal communication, June 10, 2012).

c) Evacuate involves leaving the location of the incident. If the decision is made to evacuate, individuals must make sure it is safe to do so (UPPD SERT, personal communication, March 29, 2013).

d) Inherent security design can be implemented in IHLs when a lack of security is present. Security designs can be simple additions to the school's current security plans, such as implementing blinds in windows (including doors with glass windows), installing locks that can be secured from inside the classroom, replacing old or glass doors with new security doors, or providing equipment to help one escape from a room such as rope ladders for second floor windows. Additional designs may include a window-breaking emergency escape device, door jams or blocks that secure a door when put in place, zip ties for various types of doors, particularly double doors or French doors (secured through both doorknobs), or cinch straps for outward swinging doors (one end hooks to the door frame and the other end loops around the doorknob) (NTOA, personal communication, June 10, 2012). More costly features of a security design include surveillance camera systems, electronic locks, annunciator fire and lockdown systems, walk-through metal detectors, and security resource officers (SRO).

e) Cover is sheltering behind an object that can stop bullets, such as reinforced concrete, block walls, thick steel, large trees (30 inches in diameter), thirty inches of dirt/earth, and bulletproof glass. Concealment is sheltering behind or in an object that makes it difficult for an assailant to see an individual, such as dry-wall, classroom furniture, a closet, a locker, or a cabinet (NTOA, personal communication, June 10, 2012).

f) Creating alternative escape paths can be taken when a direct escape route is impeded or obstructed by the chaotic environment. For example, pathways may be congested by carnage or objects during an active shooter event (NTOA, personal communication, June 10, 2012).

g) Layers of security course of action is secondary after school personnel have barricaded themselves in a room or building. The actions are to contact 911, silence cell phones, be quiet as possible, pull the blinds down, turn off the lights, go to the safest part of the room away from the

door, place furniture against the door to reinforce the entryway, and prepare others in the room to attack if the intruder gains entry to the room (NTOA, personal communication, June 10, 2012).

h) Addressing special needs/concerns involves preparation before an incident. Students and staff personnel with disabilities will need assistance with evacuating. These individuals have to be identified before a crisis and put into the emergency evacuation plan. The students and staff personnel with disabilities should be identified by name, special need, and location. Appointed school personnel have to evacuate those needing assistance out of the crisis area or inform first responders of their location and disability. Day care centers, research labs, and hospitals caring for patients are areas of special consideration (UPPD SERT, personal communication, January 10, 2014).

The epicenter of violence became evident on March 8, 2012, when an active shooter incident occurred at a University of Pittsburgh Medical Center (UPMC) adjacent to the University of Pittsburgh main campus. During the March 8 incident, an assailant, who had demonstrated mental health complications and bizarre behavior prior to his shooting rampage, entered the facility at 1:42 p.m. with two semi-automatic pistols. The lone intruder fired 30 rounds, killing one UPMC employee and wounding five others before being fatally struck three times by a UPPD sergeant (Hart, 2012). During the day of chaos, the incident locked down the entire campus, including four neighboring hospitals, two adjacent IHLs, surrounding businesses, and gridlocked traffic throughout the campus and region. The incident above describes an extremely difficult environment which to manage. Prior to the armed intruder entering the UPMC facility, staff and security personnel conducted tabletop exercises which provided them with possible actions to take based on their proximity to the epicenter of violence. The training reduced the number of staff personnel from becoming fatally injured. Staff personnel became familiar with barricading

themselves in office spaces, lock down procedures, and evacuation/or escaping from the epicenter of violence.

2.2.2 Preparing and Training School Personnel

Active shooter incidents are increasing and often targeted to locations such as universities where individuals are not prepared or trained to protect themselves against an active shooter attack. Targeted areas are referred to as soft targets (NTOA, 2012). These locations are usually schools, malls, churches, and public venues. There is typically no pattern or method to an active shooter selection of victims (Simons, 2014).

A rash of active shooter attacks at IHLs has taken place in the past few years: New River Community College in Christiansburg, Virginia (April 12, 2013), where a student wounded 4 people (Designer, 2013); Lone Star Community College in Woodlands, Texas (January 22, 2013), where a male actor wounded 3 people (Aldridge, 2013); Oikos University in Oakland, California (April 2, 2012), where a former student killed 7 and wounded 3 others (Kelly, 2012, p. 92); and the University of Texas Austin campus (September 28, 2010), where a student fired multiple rounds at a church located on campus, injuring no one (University of Texas, Austin, 2010, p. 2).

These latest incidents have provided vital information on issues necessary for schools to address when preparing and training school personnel including developing a unified training curriculum for schools to respond to an active shooter situation, creating threat assessment teams to evaluate troubled students before a crisis, and collaborating with first responders prior to an active shooter event (NTOA, personal communication, June 10, 2012).

The issues identified from the incidents stated above have prompted school officials to create standard active shooter training course and incident management teams (IMTs), and to

develop collaborative relationships among first-responders, emergency management and state and federal agencies. These relationships mitigate unnecessary loss of lives and property, and allow schools to continue with day-to-day functions. The Kelly (2012) report discloses the nation's need for a universal training curriculum designed to lessen the risks resulting from an active shooter event at schools. The recommendations are specific for security personnel, first responders, and school officials.

Since active shooter incidents are active and unpredictable, there is no one specific, best practice procedure for schools, security personnel, or first responders to follow. Nevertheless, school officials must examine lessons learned from previous active shooter events and prepare staff, faculty, and administrators in the event an incident may occur.

Until 2012, training and procedures for IHL personnel were limited to lockdown procedures and evacuations. The data and charts show the number of active shooter incidents and violence have increased from 1966 to 2012. IHLs are lacking the expertise in managing active shooter events as a result of not properly preparing or training personnel for violent behaviors. The outcomes of Kelly's (2012) study inform IHLs that additional research is required so educators may develop training methods and models in training and preparing personnel on responding to an active shooter event. The Virginia Tech incident described below shows the effectiveness of training. Research also demonstrates training's impact on active shooter episodes.

On Virginia Tech's campus on December 8, 2011, in Blacksburg, Virginia, the university community experienced another active shooter incident. This time the university had prepared and trained for such an event and was prepared to respond when called upon. The university had educated the community and stakeholders from prior lessons. The previous active shooter incident on campus, which claimed the lives of 33 students and staff personnel in 2007, was the deadliest

mass shooting in modern history (Hong, Cho, & Lee, 2010). During the 2011 active shooter incident, security measures were in place to manage the crisis. There were multiple responses from external agencies, campus police, and first responders who had conducted trainings together. Emergency notifications were announced immediately; school personnel had been trained to respond to locked down procedures, and the campus police were adequately trained and equipped for the crisis.

Unfortunately, the lack of ongoing training with external agencies and implementation of lessons learned in emergency plans may limit adequate response and expertise to neutralize an active shooter event. For example, on September 16, 2013, Aaron Alexis walked into Washington, D.C.'s, Navy Yard complex and opened fire. He killed 12 people and wounded four before he was fatally shot by police (Hermann & Williams, 2013). Due to a lack of training, the responding law enforcement agencies had a difficult time communicating with each other. The responding agencies were not aware of which agency was in charge of the crisis, and the agencies had a challenging time identifying which agencies were at the scene. Failure to educate themselves through examining previous incidents prevented an effective response time and effective defusing and managing of the active shooter incident, resulting in a chaotic and confusing situation.

Lessons learned can prepare IHLs for active shooter events. School leaders have to trust the public safety and law enforcement personnel they hire to manage crises on campus. Collaboration between all factions is vital to successful outcomes of school crisis. The public safety and law enforcement personnel should seek advice and expertise from other institutions and law enforcement agencies that have experienced an active shooter incident. The information gained from these interactions and relations will be valuable for mitigating, preparing, and planning for an active shooter episode. "Lessons learned" is the first step to a training curriculum.

2.2.3 Institutions of Higher Learning Lessons Learned

University communities, for the most part, felt safe on and around campuses throughout the United States until the 1966 Whitman shooting rampage (Macleod, n.d.). This active shooter incident set the stage for Institutions of Higher Learning to begin preparing to use non-traditional methods in terms of planning and alleviating these types of incidents. Schools immediately began to find alternative security measures to which institutions could react to an intruder on campus.

The Whitman incident was a catalyst that informed first responders, IHL personnel, and constituents on the importance of preparing to respond and manage situations such as active shooter event. The first major issue dealing with this incident was both the Austin Police Department and the University Police Department were inundated with calls regarding the incident. The call volume to the dispatch centers was overwhelming, making effective communication among responding agencies impossible. The agencies' frequencies were unable to transmit to each other, causing pandemonium among the university community.

The police training, equipment, and weapons were not sufficient to diffuse the crisis either. The police officers that advanced to the tower carried a borrowed 12-gauge shotgun and a .38 revolver. A civilian accompanied them and actually joined them as they ascended to the 27th floor. Whitman, previously a Lance Corporal in the United States Marines, was well trained in military combat and had a cache of weapons, including a 12-gauge shotgun, a Remington 700 6mm bolt-action hunting rifle, a .35 caliber pump rifle, a .30 caliber carbine, a 9mm Luger pistol, a Galesi-Brescia .25-caliber pistol, a Smith & Wesson M19 .357 Magnum revolver, and over 700 rounds of ammunition (Macleod, n.d.).

Moreover, during the active shooter incident, the scene became out of control when armed civilians joined the firefight on campus. Police and civilians began returning fire at the tower,

randomly trying to pick Whitman off without coordinating with other law enforcement personnel. Each person at the scene developed his/her individual plan to bring the incident to an end. There was a lack of supervision during the ordeal before the police and civilians decided to make their way towards the tower.

The Columbine High School shooting incident resulted in 13 fatal casualties and 24 wounded (Trump, 2009, p. 29). The Columbine incident proved to be a valuable lesson learned for school officials when the staff put students in defenseless areas of the school. For example, students were told to hide in the library, which had large glass walls. The students were not directed to hide in the secretary's office located in the library. In essence, the attackers were looking into a large fish bowl (Wyllie, 2010). Without proper training in active shooter, school personnel cannot assist the campus community properly and effectively during an attack.

Following the Columbine incident, first-responders and school officials restructured their practices on how to respond to active shooter situations. Part of the restructuring process consisted of changing the way first responders respond to an active shooter situation. Previously, first responders were trained to wait at an active shooter scene until enough first responders were on the scene before making entry into the building. Since that time, IHLs established preventative initiatives to aid in active shooter situations, such as threat assessment teams, metal detection devices, surveillance equipment, and school resource officers (SRO).

No one active shooter protocol that fits every situation (Kelly, 2012, p. 1). Therefore, active shooter training should be part of school personnel orientation and the training should be provided annually during in-service training. It is essential that the trainings include internal and external departments and agencies to provide a comprehensive response from multiple agencies.

The active shooter training has to provide exercises utilizing various scenarios, which will aid in personal development and awareness of how to counter threats school personnel face.

Moreover, after the Columbine incident school officials accepted that they are the first personnel to respond to a crisis episode followed by the police (Buerger & Buerger, 2010). They realized that no longer could school employees wait to be rescued by first responders and SERT before they react to an incident. While attacker(s) are committing homicidal acts, school personnel have to react to the criminal's behaviors (Buerger & Buerger, 2010). School employees can only respond to these types of incidents if they are properly trained. The goal for IHLs is to develop a training curriculum that will prepare school personnel to distract, delay, or defeat the attacker(s) until first responders arrive on scene.

Currently, IHLs officials provide training and strategies for school personnel in the following areas of concern: 1) law enforcement resources will arrive promptly and alter the dynamics of the situation (first responders' response will either cause the attackers to engage with the police or the attackers will attempt to evade or escape); 2) tactics include lock down procedures and concealing the environment to protect the students and staff rather than endanger them; 3) and once the authorities are on scene they become the sole manager and controller of the incident.

2.2.4 Summary and Conclusions

This section responded to the question: How have IHLs prepared for active shooter incidents? IHLs have to prepare for the challenges they may face if an armed intruder invades a campus environment. In order to understand the actions of an active shooter episode, schools should examine lessons learned from other incidents, including scholarly research. Literature from

experts in the fields of law enforcement and social behavior can provide the necessary tools needed for IHLs to mitigate an active shooter event.

Research has demonstrated that when institutions examine lessons learned from prior incidents, they are better prepared to manage a critical incident (University of Texas, Austin, 2010, p. 2). These lessons learned provide a framework for IHLs to develop emergency plans, implement innovative strategies to communicate with the university community, build relationships with other agencies, and provide training for school personnel.

2.3 ALTERNATIVE MEASURES TO SUPPORT INSTITUTIONS OF HIGHER LEARNING IN MANAGING AN ACTIVE SHOOTER EVENT

After the devastating effects of school shootings at IHLs, educators sought ways in which to protect their education environment. Many ideas came to the forefront such as, erecting barriers around institutions, arming and training administrators how to carry and conceal firearms, and integrating supplementary online courses to educate students through computer-generated curriculums.

After countless conferences and collaboration among school administrators and law enforcement personnel, the most logical resolution was to supplement institutions with law enforcement personnel to support and manage crisis at IHLs.

2.3.1 School Resource Officers (SROs)

After several school shootings throughout the United States, institutions rushed to place law enforcement personnel in schools to provide safety for students, faculty, and staff. These officers

are called school resource officers (SRO). Armed law enforcement personnel differ from a security person or school official in four aspects: 1) they have arrest powers, to apprehend personnel who violate the law; 2) they have a wealth of resources, such as contacts and other information in reference to emergency management with other agencies; 3) they have extensive training in firearms and active shooter training; 4) they are professionals of the law that can provide the correct actions if the law is violated (Weiler & Cray, 2011, p. 161-162).

SROs have specific training that school officials lack in responding to an active shooter incident. For example, the University of Pittsburgh Police Department (UPPD) has been preparing and training its commissioned officers in active shooter training annually since 2005. The command staff and supervisors instruct and participate in tabletop and emergency response exercises on and off campus. The initial active shooter training is 16 hours, and the annual training is 8 hours. In addition, SROs can be a member of a Special Emergency Response Team (SERT). UPPD has an 18-member SERT that has officers working on every shift. SERT has extensive training in emergency tactics, including responding to an active shooter event. The initial training is 80 hours, followed by 16 hours of training monthly. SERT also trains with multiple SERT teams in the region.

However, soon after the implementation of the police officers in schools, it was apparent that the officers were not trained adequately for the school setting. Police officers had a difficult time communicating and interacting with students and school personnel and determining their role when involved with incidents. The SROs had to make decisions whether a school violation was a criminal offense or if it was a violation of the school conduct policies. For instance, a fight between two students can be classified by a police officer as a disorderly conduct offense or an assault. However, the school views this type of incident as an altercation. There were also concerns with

who was in charge when a school incident occurred, and whether a student should be disciplined, counseled, or charged criminally (Clark, 2011, p. 89).

The state of Virginia was one of the first states to implement training for police officers in school settings. Their training program included 40 hours of instruction on legal and liability issues in school-based situations, critical incident planning and response, homeland security for schools, substance abuse and suicide prevention, gang identification and prevention, crime prevention specifically designed for environment and conflict mediation, internet crime, bullying prevention, law related educational program, and techniques for dealing with confrontational parents and students (Clark, 2011, p. 93).

Though the benefits of school resource officers (SROs) are difficult to quantify, the program was shown to be popular with students, parents, and school personnel. The 300 schools where SROs were implemented completed a survey. The greatest issues or problems identified by 37 percent of the SROs participating were school officials did not report criminal acts to the SROs (Clark, 2011, p. 97). School officials were allegedly difficult or overly involved and added to the problem instead of being part of the solution.

Schools can benefit from an SRO program that offers relevant training. Such programs have proven valuable in providing schools with effective ways of dealing with threats and terrorism, active shooters, and the daily challenges of disciplining students and maintaining a safe campus environment. SROs have become a multifaceted resource to IHLs. For example, Wake Forest University police have assigned SROs to residential halls and academic buildings, where the officers serve the university community as liaison officers at their particular assignments. The SROs assignments are in addition to the regular patrols on campus. They can also manage crises and identify students that may become a potential problem (Wake Forest Police, n.d.).

The SRO program supplements the security measures in place at schools and provides an immediate response to an active shooter situation. Continuous communication between school officials and the SROs provides a safe haven for the campus community. An SRO certified training program assists in preparing officers in managing the day-to-day operations, empowering SROs to involve school officials in difficult situations.

While school officials may have training in handling some crisis situations such as fire, altercations, and those related to minor health related issues, a lack of training and police presence at many institutions who can manage an active shooter situation still remains. The School Resource Officer Program (SRO) or the education resource officer (ERO) is not a new concept. It was designed to allow collaboration between law enforcement and school personnel to provide a safe learning environment.

SROs can be effective in handling an active shooter incident if the attacker engages the SRO first. The confrontation can provide time for the school to evacuate, hide, and call 911. Although educators may have training in emergency evacuations, they lack training in responding to an active shooter situation.

SRO programs assist schools in collaborating with first responders: the SROs build relations, provides resources, training, and memorandum of understandings (MOU). A memorandum of understanding (MOU) is an official contract between two or more parties. The written document is usually created by attorneys from the respective agencies displaying that when called upon in an emergency situation by the other agency for mutual aid, assistance will be granted. For example, when the University of Pittsburgh needed assistance with the multiple bomb threats at the university in 2012, MOUs were already in place with the City of Pittsburgh Police Department. Therefore, the requested agency was able to assist with the bomb threats without

getting written approval. The relationship between the UPPD and the City of Pittsburgh Police Department strengthened during the emergencies, which provided opportunities for mutual trainings and sharing of resources. Companies and organizations can use MOUs to establish official partnerships. MOUs provide school officials with added resources during an active shooter event, including rescue and medical teams that can provide emergency medicine to individuals who sustain injuries, hostage negotiators who will mediate a hostage situation, SERT who has the ability to neutralize an active shooter event, a public information officer (PIO) who is experienced in reporting to the media, explosive ordinance device (EOD) teams, K-9 Officers, and individuals that can provide counseling to the university community. The resources stated above are important in active shooter situations and necessary for a successful resolution.

Finally, an SRO provides an added security measure in schools and enhances the institutions' active shooter plan by instructing and training school personnel on how to respond to an active shooter situation, and an MOU builds lasting relationships and offers the possibility of training and resources that schools lack.

2.3.2 Threat Assessment

Authorities have defined the term “threat assessment” as the investigating of an individual or group who has communicated a threat or engaged in some kind of threatening behavior (Cornell, 2010, p. 10). The threat may be communicated in a number of ways, such as verbal, email, written, through a third party, or website transmission (Cornell, 2010, p. 13).

A threat assessment is a tool to assist with predicting violence at IHLs in the United States. Assessments can be conducted safely without expelling or limiting student access on campus. This is important as students who are reprimanded or given other sanctions may later cause disorder.

A threat assessment is a problem-solving process that provides school officials with time to assess possible misconduct among students or towards teachers or staff. The threat assessment has a greater possibility to interrupt or alter students' behavior before peer conflict, altercations, and bullying escalate into violence (Cornell, 2010, p. 10). The assessment provides opportunities for school officials to support students and provide mental health treatment and other contingency options.

Experts have suggested that threat assessment teams have a fair chance of identifying certain behaviors in personnel that may have the potential to lead to violence (Simons, 2014). Some of these behaviors are listed in Table 6 below.

Table 6. *Behaviors that may have the Potential to Lead to Violence*

An increase of a personal grievance towards someone, employer, significant other, the government, personal losses, chronic anger, and/or driven by delusional or paranoid states of mind (Simons, 2014).

Contextually inappropriate and recent attaining of multiple weapons (Simons, 2014).

Contextually inappropriate and recent increase in target practice and weapons training (Simons, 2014).

Contextually inappropriate and recent interest in explosives and improvised devices (IED) (Simons, 2014).

Improvised explosive devices (IED), the purchasing of IED materials (Simons, 2014).

Contextually inappropriate and intense interest in or fascination with previous active shooter events or mass attacks (Simons, 2014).

Many offenders experience a significant real or perceived personal loss in the weeks and/or months leading up to the attack, such as a death, breakup, divorce, or loss of a job (Simons, 2014).

Prior to an attack, others were concerned by the attacker's behaviors (Simons, 2014).

Along with the above-mentioned behaviors, experts have determined that active shooters target their violence towards their victims (Vossekuil et al., 2002, p. 12); specifically, the DOD's Defense Science Board's Task Force on Predicting Violent Behavior (2012) states,

perpetrators of pre-conceived violence focused on individuals, groups, or locations engage in behaviors that precede and are related to their attacks. Active shooter perpetrators often inform others of their imminent plans to attack their target by some means of communication, by verbal discussions, through the internet, texting, and or by written correspondence. They consider, plan and prepare before engaging in acts of violence. These behaviors are often detectable; providing an opportunity for disruption of the intended violence by utilizing a comprehensive, multi-disciplinary approach to assessment and intervention (p. 26).

The literature also states a pathway to violence that perpetrators often have in common prior to an active shooter incident (Simons, 2014). Table 7 explains the sequence of events and identifies the critical stages of the pathway to violence. The pathway to violence is listed in reverse order. At any time before the attacker reaches stage 4, the attacker can be de-escalated by early intervention through a threat assessment (Simons, 2014).

Table 7. *Pathway to Violence*

6) Attack
5) Breach
4) Preparation
<ul style="list-style-type: none">• Red Zone Behaviors - The most critical phase of the pathway of violence is the preparation phase.• Weapons acquisition/preparation (ready to transport weapons to target site, staged weapons for violent event)• Cleansing and purifying (drugs or alcohol)• Extreme recklessness (financial or sexual)

Table 7 (continued)

-
- Legacy token (seeks notoriety, legacy, motivation behind the attack)
 - Staging area (seeks privacy and isolation)
- 3) Research & Planning – the attacker begins to plan to engage in a violent act to harm others
 - 2) Ideation – the attacker begins to have thoughts of engaging in a violent act and harming others
 - 1) Grievance – the attacker begins to have disagreements or complaints about others
-

The simplest task of a threat assessment is for school officials or assessment teams to communicate pertinent information to other departments throughout campus when dealing with a potentially dangerous situation (Cornell, 2010, p. 12). For example, college administration, law enforcement, mental health, and legal counsel should be contacted immediately when assessing a dangerous situation.

Threat assessments have four basic steps: 1) identify the threat, 2) evaluate the seriousness of the threat, 3) intervene to reduce the risk of violence, and 4) follow-up to monitor and re-evaluate the effectiveness of the safety plan (Cornell, 2010, p. 12-14).

Critical features of a successful threat assessment team follow (Cornell, 2010):

1) Administrative support – “The leadership of the institution must convey clear support for the threat assessment team, so that all administrative units of the institution will be willing to provide information and accept the team's guidance in dealing with threatening situations. There must be clear policies and procedures that establish the team's authority and scope of action (p. 14).”

2) Campus-wide education – “Students, faculty, staff members, and the community as a whole should be educated about the importance of seeking help for persons in distress, whether or not a threat is involved. The community members that are part of an institution must be able to identify threats and understand the importance of reporting them immediately to the team (p. 14).”

3) Cross-disciplinary teamwork – “A threat assessment team should draw on the expertise of professionals in law enforcement, mental health, and higher education. Team members must develop the mutual trust and respect that permits them to work creatively to develop individual solutions for each case (p. 14)”

Finally, although violence often cannot be predicted in specific situations, an environment that houses thousands of students has a responsibility to protect their interests. Therefore, safety measures that can be implemented to prevent potential violence on and off campus should be introduced to school officials and threat assessment teams. If schools can decrease underage drinking on campus by identifying violators and providing peer counseling, surely threat assessments can identify troubled students and thereby prevent violence on and off campus.

2.3.3 Building and Maintaining Relationships with External Agencies

The Virginia Tech incident is a great reminder of why Institutions of Higher Learning (IHLs) and first responders should maintain a continuous relationship in order to prepare and train personnel to mitigate active shooter situations. Collaboration among agencies will provide both an increase in security efforts and make available a safe campus environment to protect students from internal and external threats.

During the horrific Virginia Tech shootings, vulnerabilities among the security measures that schools rely heavily upon were made obvious. School officials at Virginia Tech attempted to make decisions during a difficult and complex crisis.

The initial report from authorities to school personnel was that the active shooter threat ended after two students were located and confirmed dead in one of the residence halls on campus. However, two hours later the massacre began in another building on campus, where the shooter killed 31 additional students and then himself. There was a two-hour lapse in the institution notifying the university community that there was an active shooter on campus and a failure to activate lockdown procedures. The decision to delay the notification and lockdown procedures proved to be critical mistakes in the school's decision-making process. After the incident, it was clear that their decisions and security efforts were not effective for dealing with the threats and terrorist actions of a deranged assailant (Kennedy, 2007, p. 20).

Quickly, IHLs and law enforcement personnel realized that IHLs cannot withstand an active shooter episode alone, despite advancements to the nation's IHLs security efforts to provide a safe learning environment through surveillance and electronic keyless entry access.

Therefore, schools, safety officials, and outside experts in the fields of emergency management and law enforcement now have to build and maintain relationships with external agencies because those relationships are crucial components to managing a crisis. The interactions increase the ability to strategize together and identify the vulnerabilities. The all-inclusive efforts provide for the best outcomes and modification to emergency situations and plans. An evaluation of emergency procedures must be reviewed by all stakeholders to see if previous or current emergency plans can withstand an emergency crisis such as an armed intruder on campus. An all-hands approach much be implemented to include external agencies in making final decisions on

the best practices in responding to a critical incident. Including outside assistance in organizing emergency plans and exercises allows for a holistic emergency response that can improved the managing of a crisis. IHLs must seek and consider external advice from outside security experts and discuss recommendations to improve response times and better manage an emergency situation. This also means that following training, exercises, or a crisis event, an after action review (AAR) must be conducted among participating agencies. The AAR discussion should focus on the sustainability of, vulnerability of, improvements to, or changes to the emergency plans (University of Texas, Austin, 2010, p. 18).

Moreover, IHLs' police personnel should be trained and equipped with the weapons and equipment that responding agencies use to respond adequately to an active shooter event. If not, the first response will be inadequate to neutralize the crisis and continuing chaos will evolve.

In conclusion, there are many challenges to offering students and their families an open campus setting while providing a safe environment at the same time. Schools should take a greater role in collaborating with other university officials and outside agencies to improve and maintain working relationships. These relationships can provide innovative and comprehensive training needed to manage an active shooter incident.

This section of active shooter training describes responding external agencies, their expertise, and resources. The curriculum is not included for security reasons; however, credentialed law enforcement officials will be sent a copy upon written request to sellies@pitt.edu.

There is no reason why IHLs should have to face an active shooter incident alone; with the many agencies and resources available, schools will be able to manage a crisis situation better. In order for IHLs not to process a crisis alone, they must build and maintain relationships with external agencies, a crucial component in managing a crisis.

Prior active shooter incidents have caused chaos on campuses. However, excluding external agencies in the preparation and training phases of emergency planning would be devastating. When students are at risk for potential violence, the school, local, state, and federal agencies must collaborate for a thorough outcome.

2.4 ALTERNATIVE ACTIVE SHOOTER TRAINING FOR INSTITUTIONS OF HIGHER LEARNING

Schools and universities have quickly learned over the past few years that Institutions of Higher Learning (IHLs) are not exempt from active shooter events. Therefore, in 2007, IHLs such as the University of Pittsburgh rushed to implement emergency plans, training staff to identify potential violent threats, and preparing crisis teams to mitigate and manage crises during and after the event.

The Secret Service and Department of Education began examining the behaviors exhibited by active shooter perpetrators. They conducted an entitled, “Safe School Initiative.” The purpose of the study was to prevent violence and assist schools in possibly identifying violent behaviors before an active shooter attack (Fein, Vossekuil, Pollack, Borum, Modzeleski, 2002, p. 4). Identifying signs of violence in students helps schools create a safe learning environment for students, school officials, faculty, staff, and parents. The Safe School Initiative provides various teaching and training alternatives for school officials and their staff. The information gained regarding pre-attack behaviors was analyzed to produce a knowledge base to target school attacks. A potential active shooter displays observable pre-attack behaviors that, if recognized, can lead to the disruption of a planned attack (Simons, 2014). The behaviors are most recognized by someone close to the actor. For example, possible perpetrators of an active shooter event may feel calm

after an argument when usually the actor would be upset about the situation. The actor may also discontinue drinking alcohol for no apparent reason (Simons, 2014). Recognizing pre-attack behaviors in potential students who displays violent behaviors is an alternative training tool for IHLs to implement during in-service training and orientation. Schools who have experienced an armed intruder on campus, such as Ohio State University (March 9, 2010) and Northern Illinois University (February 14, 2008), may have been able to mitigate and manage a crisis event if a strategic emergency plan and an incident management team (IMT) had been in place. For example, many IHLs departments have begun training key personnel in Crisis Intervention Training (CIT). CIT instructors train personnel in responding and recognizing consumers who may have a mental health problem.

The “Safe School Initiative Study” examined characteristics and behaviors demonstrated by potential active shooters. An analysis of individuals from targeted schools who had previous active shooter occurrences was completed. Information was collected and further analyzed identifying indicators of behavior that would strongly indicate an individual as a prospective active shooter. Each incident of targeted violence from the schools was assigned to a study review team (Vossekuil et al., 2002, p. 8). The study teams collected data and in turn provided school officials with pertinent information to assist in developing protocol to mitigate future active shooter incidents. The study teams consulted on a regular basis with school officials and experts in the fields of education and school violence to develop study designs and protocols (Fein et al., 2002, p. 11).

The end results offered indicators and behaviors of potential active shooters for school personnel to recognize. The study findings suggest that school and law enforcement officials focus their efforts on devising strategies in two principle areas: (1) Developing the capacity to identify

and evaluate information that may indicate a risk of a targeted school attack. This involves gathering any indication that a student displays uncharacteristic behaviors (Fein et al., 2002, p. 19) For example, a student displays truancy behaviors when previously he/she has been punctual; and (2) Reviewing the results of the threat assessments to aid in creating methods or plans to prevent possible school attacks from occurring (Fein et al., 2002, p. 19). School officials need to discuss and devise contingencies for students who display threatening behaviors. The contingencies must consist of counseling with internal or external mental health professionals, intervention from a law enforcement officer, or meeting with school officials.

IHLs must dedicate staff and time for proactive preventive measures in identifying possible violent threats towards the campus environment as well as in developing curriculums for school personnel to respond adequately to a crisis incident. Initiating Safe School Initiatives' model of identifying behaviors in potential violent students prior to an active shooter episode can contribute to the identification and disruption of targeted violence (Simons, 2014). Educational administrators must designate proactive staff members to lead the IMT.

2.4.1 Implementing Crisis Teams

IHLs who implement crisis teams may be able to prevent or better manage an active shooter episode. Incident Management Teams (IMTs) provide school officials with well-trained and proactive professional personnel with the ability to evaluate potential threats, assess possible violent altercations prior to occurring, and mitigate and manage a crisis episode.

Moreover, because each event is dynamic and evolving, school leaders must design an emergency plan and IMT(s) according to their school size and population. Institutions should

develop multiple IMTs to manage a crisis incident. Such, multiple crisis teams are necessary to manage the volume of personnel at institutions.

However, ongoing training must be implemented internally and externally in order for the IMTs to be prepared for an emergency. The internal training provides instruction from experts employed by the institution. The instructors provide security measures within an individual's workspace and/or building, and can offer inexpensive, on-going trainings. The external training allows law enforcement practitioners to share personal experiences on best practices during a crisis situation. IMTs training should include lectures, power point presentations, video, tabletop exercises, and practical exercises to best prepare IMTs for dealing with the challenges of evaluating and developing contingency plans. Department of Homeland Security suggests and provides multiple staff training programs.

Each member of the IMT will have a check-list and should follow that list accordingly when called on in an emergency. For instance, secretaries may be responsible for recording the crisis incident as it evolves so that the institution and law enforcement personnel can have a record of the event. Later the institution will be able to measure the effectiveness of the IMTs during an emergency by reviewing the recorded document. Randazzo and Deisinger (2008) suggest the following school departments who would be an asset by participating on an IMT: academic affairs, provost, graduate college, employee assistance, human resource services, media relations, police, security, residence life, student affairs, dean of students, student health, and counseling service. The IMT members must have the following essential skills to be an effective team: passionate about the goals of the team, familiar with threat assessment principles and practices, demonstrates an inquisitive and skeptical mindset, exercises good sense of judgment, objectivity, and thoroughness, relates well with others, effectively facilitates team discussion, and advocates for

necessary resources (Randazzo & Deisinger, 2008). In conclusion, training IMTs lessens the chaos, anxiety, and stress of a crisis situation as people tend to revert back to their training under stressful situations. IMTs are paramount to a successful active shooter resolution. Therefore, every IHL should mandate the creation of a threat assessment team.

2.4.2 Using National Incident Management System (NIMS)

In March of 2004, the Department of Homeland Security developed and implemented the National Incident Management System (NIMS). NIMS provides a cohesive national approach for multiple jurisdictions to collaborate with surrounding agencies during crisis and disaster situations (Federal Emergency Management Agency, n.d.). Soon after its establishment, IHLs implemented training of personnel in the National Incident Management System (NIMS). NIMS instituted new practices to replace outdated ineffective ones to assist IHLs in managing crisis events to lessen casualties. Prior to NIMS inception, first responders flooded the scene of the incident area.

This type of response causes loss of life and property. For example, during the 911 incident on September 11, 2001, emergency vehicles rushed to the scene to support the casualties. The emergency vehicles gridlock the entrances and exits surrounding the crisis scene, causing a traffic jam, which hindered the movement of vehicles who responded to the area. When the first tower collapsed, the destruction increased the loss of life and equipment. Also, the structure or area may be booby trapped with explosives, adding additional numbers to the death count and less emergency workers during a chaotic scene. Under NIMS, responding personnel report to an Incident Command System established outside of the crisis incident. Responding personnel are met by a Unified Command that manages the crisis. The unified command consists of department directors from involved and responding agencies.

Institutions of Higher Learning (IHLs) have adopted Federal programs for designing emergency plans and training staff, faculty, and administrators. The National Incident Management System (NIMS) has provided IHLs with various ideas and trainings for schools to implement prior to, during, and after an emergency crisis regardless of the event's magnitude. NIMS provides a cohesive national approach over multiple jurisdictions, allowing everyone involved to collaborate effectively during any type of crisis.

NIMS empowers the jurisdictions that surround a crisis incident to come together and create one unified command. Under the unified command system, the responding agencies will plan, organize, make decisions to resolve the crisis, and communicate to the stakeholders and media under one voice. The multi-jurisdiction response builds and sustain relationships among responders.

NIMS provides a uniform, nationwide approach to work effectively and efficiently together to prepare for, respond to, and recover from domestic incidents no matter what the cause, size or complexity, including catastrophic acts of terrorism and disasters (U.S. Legal, n.d.). IHLs have incorporated the NIMS in training the university community. The trainings are recommended to incorporate scenario based emergency exercises such as tabletop exercises designed to test the theoretical ability of a group to respond to a situation (Duncan, Pelesle, & Esquith, 2013). A full-scale emergency exercise includes a multi-jurisdiction response from the surrounding region to one location. It is an emergency exercise as real as an actual emergency. The responding agencies bring all of their resources to the emergency as if it was an actual emergency.

The tabletop exercises should include both IHLs' and surrounding agencies' emergency management professionals. Table 8 identifies trainings offered by NIMS specifically for IHLs and the community (NIMS, 2008).

Table 8. NIMS Training for IHLs

Training	Description
Emergency Planning for Higher Education Training	This training course emphasizes the significance of collaborating, building relationships, and planning among IHLs and emergency agencies (FEMA – Emergency Management).
IS-907 Active Shooter	Every school personnel can assist in an active shooter event. School personnel can mitigate, prepare, and manage a possible active shooter incident. The training provides guidance to individuals, including managers and employees, so that they can prepare to respond or assist during an active shooter situation (FEMA – Emergency Management).
IS-29 Public Information Officer Awareness	This course covers basic information about the role of a State or local Public Information Officer. The goal of this awareness course is to provide an orientation to the public information function and the role of the Public Information Officer (PIO) in the public safety/emergency management environment (FEMA – Emergency Management).
IS-100.HE- Introduction to Incident Command System for Higher Education	The training explores the Incident Command System (ICS), which is a standardized, on-scene, all-hazard incident management approach. ICS provides the foundation for higher level ICS trainings. ICS is a systematic tool used for the command, control, and coordination of emergency response and is a subcomponent of the National Incident Management System (NIMS). School personnel will learn the history, features and principles, and organizational structure of ICS. In addition, the relationship between ICS

Table 8 (continued)

	and NIMS is discussed (FEMA – Emergency Management).
IS-235.b Emergency Planning	This session offers training in the fundamentals of the emergency planning process, including the rationale behind planning. It develops school administrators’ ability for effective participation in the all-hazard emergency operations planning process to save lives and protect property threatened by disaster (FEMA – Emergency Management).
Campus Community Emergency Response Team (CERT)	The CERT is a program that instructs and trains faculty, staff, and students about disaster preparedness for hazards that may affect their area and trains them in a variety of emergency response skills (FEMA – Emergency Management).

The leaders from each responding jurisdiction must be able to share their resources to work toward the common goal and objectives of managing a critical event. When leaders from multiple agencies make decisions, the command staff from each agency provides input to resolve the crisis.

ICS provides school personnel with the history and organizational structure to assist other agencies during a crisis at IHLs. When a crisis episode occurs at an IHL, and as the incident becomes more involved and other resources are needed, then the IHL administrators begin to seek external support. Once the requested assistance responds to the crisis area, the leadership personnel from the responding agencies reports to the incident command post, a centralized destination near the incident designed for key leaders to meet to resolve a crisis. The unified command works together to understand the environment to solve the situation. However, the

leaders do not surrender their authority. The unified command seeks each other's expertise for resolution.

It is important to understand that the IHL becomes a partner in the incident command and do not assume sole authority during a critical incident. However, the responding agencies are in need of the IHL expertise, so the IHL should be part of the decision-making. During a critical incident such as a protest on an IHL's campus, the Command Staff organization will integrate responding organizations in its command structure.

The Unified Command consists of the agencies involved in the incident. Usually, fire and rescue, law enforcement, IHL administrators, and personnel from these agencies are assigned as Assistant Officers. The Joint Public Information approach ensures that the responders will speak with one voice. IHLs have made ICS part of the curriculum when training personnel in emergency management and responding to crisis situations. In 2007, NIMS made it mandatory for law enforcement agencies to be included in trainings that protect the infrastructure of the nation's territories; this includes IHL certified campus police departments.

For many, IHLs IS-100 (Higher Education HE - Introduction to Incident Command System for Higher Education) is the preferred training for their staff. This course provides the basic knowledge of what school personnel should do prior to, during, and after a crisis event. The training provides the foundation for higher level ICS training. This course describes the history, features and principles, and organizational structure of Incident Command Structure. It also explains the relationship between ICS and the National Incident Management System (NIMS), (Federal Emergency Management Agency, n.d.).

2.4.3 Active Shooter Training for Faculty, Staff, and Civilians

2.4.3.1 Administrators, Faculty, and Staff Active Shooter Training

Throughout the United States IHLs began seeking training to prepare and mitigate active shooter incidents occurring at schools in this country. The University of Pittsburgh became proactive in identifying active shooter training in 2005 when the institution developed a SERT. The SERT consisted of 18 members who trained 16 hours monthly and 40 hours with other SERT teams in the county during the summer months. The SERT is capable of responding and managing critical incidents throughout the campus community.

From 2005 until 2007, three shootings occurred at IHLs that meet the DHS's active shooter definition. It identifies an active shooter as an individual actively engaged in killing or attempting to kill people in a confined and populated area (Kelly, 2012, p. 1). On September 21, 2007, 18-year-old Loyer Braden, a student at Delaware State University, opened fire in the campus dining hall, killing one student and injuring another (Kelly, 2012, p. 105). On April 16, 2007, 23-year-old Virginia Tech student Seung-Hui Cho opened fire inside a university dormitory and in several classrooms, killing 32 people and wounding 20 others (Kelly, 2012, p. 106). On September 13, 2006, Kimveer Gill, 25, a non-affiliate of Dawson College, opened fire on students in a Canadian college, killing one person and wounding 19 others (Kelly, 2012, p. 108).

After the above-mentioned incidents, the UPPD SERT created and developed an active shooter curriculum to train the UPPD. Prior to 2007, UPPD SERT was the only trained police personnel to respond to an active shooter event. The mandatory training is conducted annually to demonstrate innovated ideas and concepts on how to defeat and manage an active shooter attack. The training was effective with respect to both time and the quality of the response when UPPD responded within one minute and 46 seconds to an active shooter incident. On March 8, 2012, at

a facility adjacent to campus, an armed intruder entered a building with two loaded automatic handguns and began opening firing (30 rounds) on innocent individuals. The attacker wounded six people, killing one of his victims. He was fatally shot by UPPD law enforcement personnel (Hart, 2012).

Even though the above-mentioned incident response time was minimal, the attacker manage to harm innocent people. Therefore, it is important to provide active shooter training for IHL personnel to lessen the carnage and injuries of an active shooter attack. In the aftermath of the campus related armed intruder attack, the UPPD SERT created and developed a curriculum for administrators, faculty, and staff members to mitigate, prepare, and respond to an active shooter event in 2013.

First, the instructors were certified through the National Tactical Officers Association (NTOA) and the Federal Law Enforcement Training Center (FLETC) in active shooter curriculums. The defense tactical instructors were certified through the Commonwealth of Pennsylvania under the Municipal Police Officer Education and Training Commission (MPOETC). The 4 to 8 hour active shooter course for IHLs is designed to provide individuals with the necessary skills to react to an active shooter threat.

The following tables provide the recommended training curriculum for administrators, faculty, and staff recommended by NTOA and UPPD SERT for educational institutions (NTOA, 2013). Table 9 describes the course training goals and topics covered in the active shooter training, Table 10 identifies the objectives of the course, Table 11 describes the four keys to surviving an active shooter incident, and Table 12 demonstrates the course instruction.

Table 9. *Course Training Goals*

-
- Historic overview of active shooter events (NTOA, personal communication, June 10, 2012)
 - Lessons learned from active shooter events (NTOA, personal communication, June 10, 2012)
 - Survival and mindset of the course participants (NTOA, personal communication, June 10, 2012)
 - Cover versus concealment, what are the difference between the two options (NTOA, personal communication, June 10, 2012)
 - The “Epicenter of Violence” and the decision making based on the proximity of violence (D. Papale, personal communication, June 10, 2012)
 - Barricade and Evacuation, what is the best option (NTOA, personal communication, June 10, 2012)
 - Civilian justifiable use of force under the Pennsylvania Law (West, 2013, p. 76)
 - Emergency defense tactics (UPPD SERT, personal communication, January 10, 2014)
 - Overview of the police response (NTOA, personal communication, June 10, 2012)
 - Improvise explosive devices (IED) as a threat (NTOA, personal communication, June 10, 2012)
-

Source: Reprinted with permission from National Tactical Officers Association, July 23, 2015

Table 10. *Training Objectives of the Course*

- Identifying the “Epicenter of Violence”
 - Cover and Concealment: Identifying what and where is cover and concealment, positioning self and others behind cover and concealment
 - Evacuation protocol for an active shooter situation, the emergency plan must be different from a fire drill evacuation
 - How to properly secure and barricade a room or your place of hiding
 - When to implement emergency defense tactics to save your life and others
 - Participants to participate in a controlled scenario under tense, uncertain and evolving situations
-

Table 11. *Four Keys to Surviving an Active Shooter Incident*

Key	Explanation
Situation Awareness	being aware of your surrounding (NTOA, personal communication, June 10, 2012)
Mindset	approaching the event/crisis with a must win attitude, believing that you can win this fight and save as many people as you can, believing that no one is going to stop you and you won't quit until there is a resolution (NTOA, personal communication, June 10, 2012)
Intensity	displaying the confidence, strength, and passion that you can succeed and by your actions you will encourage others (NTOA, personal communication, June 10, 2012)
Physical Fitness	being fit can provide you with self-control and calm, provide the ability to calm self. Even when body wants to shut down you are able to function during extreme conditions (NTOA, personal communication, June 10, 2012)

Source: Reprinted with permission from National Tactical Officers Association, July 23, 2015

Table 12. Course Instruction

Part I - 30 Minutes
Instructor Introductions
Power Point Presentation – History of Active Shooter Events
Part II – 90 Minutes
Emergency Defense Tactics
5 Minutes: Warm-up (stretching exercise), instructors will cover Readiness, Awareness, and Self-Preservation instinct – which is a heightened sense of awareness of your surroundings, instead of shutting down and hiding you are able to make decisions and calm others
10 Minutes: Instructors will cover body platforms (fighting stances), patterns of movement (proper foot movements to prepare to attack or maneuver), theory of relative positioning (positioning self to be able to attack from every angle), and combat anatomy (areas of the attackers body that if punched or strike it can easily cause the central nervous system to fail, causing the attacker to drop the weapon(s) or buy time for others to assist in the attack on the intruder. Participants will perform the compass of drills
30 Minutes: Participants will perform striking (punches and kicks) movements during defense tactic instructions, then will progress to a striking a padded bag, ground defense drills (striking and kicking an attackers hips, legs, and knees; causing the attacker from moving around). Instructors will display improvised weapons (pencils, scissors, staplers, etc.)
30 Minutes: Participants will be shown how to tie up an armed intruder if faced with an attacker and have no other options to survive other than to fight the attacker. Participants will be shown and will demonstrate how to cause different weapon systems to malfunction. Participants will practice the techniques shown
15 Minutes: In a controlled setting, participants will be given a defense tactic that they previously learned and a scenario which will put them in a physical encounter with an attacker. The participants will be instructed to act out the situation. Instructors will be wearing a padded suit for participants to perform the tasks
Part III – 30 Minutes
Participants will be divided into small groups of 5-6 individuals, each group will have an instructor assigned to them, instructors will demonstrate the steps taken to secure and barricade a room, participants will identify and point out cover and concealment within their work space
Part IV – 60 Minutes
Participants will report to their work stations and controlled scenarios of an active shooter incident will be conducted. The participants will use the skills instructed to them during the active shooter training

Table 12 (continued)

Part V – 30 Minutes

An after action review (AAR) - an AAR is a professional discussion of an event, focused on performance standards, that enables participants to discover for themselves: what happened during the training, why it happened, and how to sustain strengths and improve on weaknesses (Army Study)

In conclusion, this section describes alternative active shooter measures that IHLs can implement in their training curriculums. It is important to remember that each active shooter incident has different dynamics and outcomes; therefore, it is crucial for IHLs to provide their institutions with up to date bi-annual and annual trainings. Certain agencies even provide free active shooter training for IHLs. Schools must be creative and provide the time for such training, and the time is now.

2.4.4 Conclusions

Active shooter school shootings are not a new phenomenon. For the past 48 years, active shooter incidents have occurred in United States IHLs, and there has been no end to such active shooter incidents. The first recorded active shooter incident occurred in 1966 at the University of Austin, Texas (Kelly, 2012). The Virginia Tech shooting on April 16, 2007, was the catalyst for IHLs to begin seeking methods to mitigate and respond to an armed intruder on a campus.

The Federal Bureau of Investigation (FBI), Department of Homeland Security (DHS), Department of Education (DOE), and other law enforcement agencies have been examining and analyzing active shooter incidents in order to understand the underlying causes and to combat active shooter attacks. This review presented a) lessons learned from preparing institutions of

higher learning (IHLs) for an active shooter event, b) alternative measures to support institutions of higher learning (IHLs) in managing an active shooter event, c) alternative active shooter training for institutions of higher learning (IHLs). The literature confirms that IHLs have to take alternative measures to protect their interest.

Though a great deal has been written about the experiences of first responders and IHL employees in active shooter incidents, much remains to concern us. First, agencies and IHLs differ considerably, and their differences contribute to confusion at the scene. Secondly, individuals at IHLs and responders are not clear about their roles and interactions with first responders. In fact, being together at a scene does not guarantee teamwork leading to an effective response. Thirdly, educators and responders who do not train together may not cooperate effectively during a crisis.

IHLs need to support the law enforcement community in providing a standardized curriculum to protect the campus environment and its interest, and this review, by examining active shooter events and training in detail, could inform such training. The subject of the proposed research outlined in Chapter 3 examines alternative measures IHLs can adopt to create an active shooter curriculum for their institutions.

3.0 METHODS

3.1 STATEMENT OF THE PROBLEM

The increase in active shooter attacks alone should alert IHLs to the necessity of preparing and training staff personnel for an active shooter encounter. Without a shared training program to prepare properly for an active shooter attack, IHLs remain at serious risk. However, there is still no standardized joint training for responders and IHL faculty and staff in the United States.

3.2 RESEARCH QUESTIONS

This study evaluated the effectiveness of a campus active shooter training program. Specifically, the research determined whether, after training, participants can:

1. demonstrate mastery of knowledge about active shooter incidents
2. demonstrate correct hands-on defensive tactics
3. conduct an assessment of their physical environment to identify how to protect themselves and others, and
4. demonstrate effective responses to an active shooter in a simulated situation.

3.3 THEORETICAL FRAMEWORK

The increased incidents of school shootings at Institutions of Higher Learning (IHLs) in the United States have become a great concern for school administrators and law enforcement officials. The literature review presented a) lessons learned from preparing institutions of higher learning (IHLs) for an active shooter event, b) alternative measures to support institutions of higher learning (IHLs) in managing an active shooter event, and c) alternative active shooter training for institutions of higher learning (IHLs). An examination of the literature review provides the definition of what is considered an “active shooter incident” and provides evidence for the increase occurrences of active shooter events at IHLs. Lessons learned from active shooter incidents are also discussed, and various security alternatives to mitigating and responding to an active shooter crisis are investigated.

The evidence presented in this research makes it clear that IHLs can no longer depend solely on outside agencies to protect them from an active shooter event. In fact, IHL employees have to respond before law enforcement arrives. A great deal has been written about the experiences of first responders and IHL employees in active shooter incidents, and this literature reveals much to concern us. First, agencies and IHLs differ considerably, and their differences contribute to confusion at the scene. Secondly, individuals at IHLs and responders are not clear about their roles and interactions. In fact, being together at a scene does not guarantee teamwork leading to an effective response. Thirdly, educators and responders who do not train together cannot partner effectively in a crisis.

Without a shared training program to prepare properly for an active shooter attack, IHLs remain at serious risk.

This study investigates how an effective training program can improve the outcomes of active shooter incidents at IHLs to help protect human life and IHLs infrastructure.

3.4 RESEARCH DESIGN

In exploring a theoretical framework for active shooter training, a descriptive evaluation design was used. A descriptive design is appropriate for this study because it includes a comprehensive but reasonable combination of sampling, data collection, analysis, and demonstration methods. The descriptive design is the method of choice when straight descriptions of phenomena are desired (Sandelowski, 2000, p. 334). This method is appropriate for this study as IHLs and stakeholders are interested in evaluation of training to determine if further training is needed.

3.5 SETTING AND PARTICIPANTS

This study took place on the main campus of a Mid-Atlantic university that enrolls 28,769 students. The IHL employs 12,527 individuals and is located in the heart of a traditional neighborhood. The university is known as an internationally respected center for learning and research. The university community is urban and diverse and is home to a number of universities, museums, and hospitals, as well as an abundance of shopping places, restaurants, and recreational activity spaces.

The university police department's Special Emergency Response Team (SERT) provides active shooter training. The university's police department is the third-largest law enforcement agency in the county, providing 24-hour protection for nearly 40,000 students, faculty, and staff.

The department covers the 132-acre main campus and employs around 100 commissioned officers, including, among regular patrol officers, a motorcycle unit of six officers, a bicycle unit of six officers, a K-9 unit of four officers (two are K-9s), and the SERT. The SERT team is fully equipped to respond immediately to life-threatening events. All commissioned officers are certified under state law and receive training in “rapid response, active shooter” situations on a regular basis.

3.5.1 Participants

Once the university department indicated interest in participating in the active shooter training, a SERT member met with the administration of that department to review the rules and procedures of the training. An agreed date and time to schedule the active shooter training was established. It is the university department’s responsibility to identify participants for training, which may include administrators, faculty, and staff. Specifically, participants in this study were faculty and staff members who are regular employees of an institution of higher learning and who volunteered or were required to attend active shooter training. The participants for this study are members of these groups; age, health, and disabilities are not factors in participating in the training. The target number of participants for this study was 25–35 university personnel. Students and non-employees were not permitted to participate in the training.

3.6 DESCRIPTION OF THE TRAINING

3.6.1 Trainers

The trainers are certified through the National Tactical Officers Association (NTOA) and the Federal Law Enforcement Training Center (FLETC) in active shooter curricula. The defense tactical trainers have additional certification through the State Municipal Police Officer Education and Training Commission. Additionally, two certified Emergency Medical Technicians (EMT) participated in the training. They are certified through the state and have completed over 160 hours of emergency medical training. The EMTs assess and provide medical treatment to participants who may injure themselves. The EMTs are also required to document and follow up on participants who report injuries.

3.6.2 Forms Participants Complete Prior to Training

Prior to the active shooter training evaluation, participants read, printed and signed their names, and dated the following forms:

- Training and safety rules form: explains that participants acknowledge their physical disabilities, limitations, illnesses, or other conditions that would affect their ability to participate in the active shooter training. Further, the form provides instructions to follow if an injury or a medical emergency occurs.
- Release and waiver form: a legally binding document verifying that participants will not sue or seek compensation from the IHL for injuries or harm caused during the active shooter training.

After the completion of the forms, the instructors collected the documents and printed and signed their names as witnesses to the participants' signatures. The forms were transported to the police department and stored in a locked filing cabinet for the next 5 years.

3.6.3 Content and Goals of the Training

The main goals of the training are to enable participants to:

- Identify and demonstrate the principles of “Cover and concealment”
- Recognize the active shooter evacuation protocol for an active shooter situation; the procedure and plan is different than that of a routine fire drill
- Perform steps to properly secure and/or barricade one's office space
- Implement emergency defense tactics to save one's life and that of others
- Participate effectively and reliably in a controlled simulation under a tense, uncertain, and rapidly evolving active shooter situation

This section of active shooter training consists of a curriculum developed by the SERT. The curriculum is not included for security reasons; however, credentialed law enforcement officials will be sent a copy upon written request to sellies@pitt.edu.

This section consists of a suggested training agenda developed by the SERT. The suggested training agenda is not included for security reasons; however, credentialed law enforcement officials will be sent a copy upon written request to sellies@pitt.edu.

3.6.4 Didactic Presentation on Active Shooter Incidents

The teaching didactic is multi-faceted, including, but not limited to, use of audio-visual aids, hands on training, and enacting of active shooter scenarios. The purpose of the active shooter training is to capture various learning styles and provide a structurally controlled environment to carry out safe active shooter simulation scenarios.

3.6.5 Hands-on Defensive Tactics Training

Defensive tactics are discussed as part of the hands-on application experience. This portion of the training takes approximately 90 minutes to complete.

This section of active shooter training consists of hands-on defensive tactics. The defensive tactics are not included for security reasons; however, credentialed law enforcement officials will be sent a copy upon written request to sellies@pitt.edu.

3.6.6 Assessment of the Physical Environment for Cover and Concealment

Participants were divided into small groups of 5-6 individuals. Each group had an instructor assigned to them. Instructors demonstrated the steps taken to secure and barricade a room, and participants must be able to identify and point out cover and concealment within their workspace.

This section of active shooter training consists of assessment of the physical environment for cover and concealment. The breakdown of the physical environment for the cover and concealment portion of the training is not included for security reasons; however, credentialed law enforcement officials will be sent a copy upon written request to sellies@pitt.edu.

3.6.7 Active Shooter Simulation

Participants reported to their workstations, and controlled scenarios of an active shooter incident were conducted. The participants used the skills learned during the active shooter training to deal with the “active shooter.”

This section of active shooter training consists of an active shooter simulation developed by the SERT. The simulation is not included for security reasons; however, credentialed law enforcement officials will be sent a copy upon written request to sellies@pitt.edu.

3.7 MEASURES AND DATA COLLECTION PROCEDURES

The instruments used to gather data regarding the research questions included a pre- and post-survey and direct observations to measure participants’ learning outcomes. Surveys are effective for this study because they rely on individuals’ self-reports of their knowledge, attitudes, or behaviors (Mertens, 2010, p. 173). It is important to capture the participants’ accurate interpretations of the training to inform future adaptations of the training curriculum. The direct observation of behavior is required by the researcher to accurately evaluate and measure training outcomes (Mertens, 2010, p. 173). A measuring system can help determine where the training needs to be adjusted or improved to satisfy the training objectives. An evaluation of a training curriculum answers whether the training is meeting its goals and will provide a starting point for improvements such as developing an active shooter advanced curriculum or mandating annual and/or standardized training for faculty and staff. Measuring participants’ learning outcomes

demonstrates a tangible and significant benefit that provides additional resources for interested decision-makers (Kirkpatrick, 2014).

As mentioned above, the research will determine whether participants can:

- Demonstrate mastery of knowledge about active shooter incidents
- Demonstrate correct hands-on defensive tactics
- Conduct an assessment of their physical environment for cover and concealment (To identify how to protect themselves and others)
- Demonstrate effective cover and concealment in a simulated situation
- Demonstrate correct hands-on defensive tactics in a simulated situation

Each of these domains requires its own assessment measure described below.

3.7.1 Survey of Participants' Knowledge

A pre- and post- survey was administered to participants to evaluate whether the participants understood the concepts of the active shooter training. A web-based survey was the best data collection strategy for this study because of the many advantages of using Web-based surveys: convenient access to samples, reduced cost, faster responses, more interactive or tailored formats, quick troubleshooting, automated data collection, scoring, and reporting, and access to larger samples (Mertens, 2010).

The assessment of participants' mastery of knowledge determines whether participants comprehended the active shooter training and whether they have the knowledge to apply what they learned in an active shooter-training situation.

The pre- and post- surveys consisted of questions pertaining to demographic information, current work environment, and training outcomes. They determined whether participants were

able to describe “active shooter,” identify potential indicators of an active shooter, describe threat analysis, the OODA Loop cycle and epicenter of violence, demonstrate cover and concealment principles, preplan escape routes, and know what to expect when law enforcement arrives both before and after the training.

Each department maintains a contact list and email addresses of its employees. The administrator of each department has regular contact via email with its employees, who provided an email roster to the principle investigator. The pre- and post-surveys were sent to the participants prior to the training.

To collect the surveys for this study, the researcher contacted employees via email. The email included information about the researcher, purpose of the study, an Internet link via Qualtrics, online survey software to access the survey, and a due date for completing the surveys. The pre-survey was closed prior to the training and the post-survey was close two weeks after the training. The researcher sent reminders via email reminding participants to complete the pre- and post-surveys. Table 13 illustrates the pre-survey and post-survey questions.

Table 13. *Surveys*

Pre- Survey Questions
1. Gender: <input type="checkbox"/> Male <input type="checkbox"/> Female <input type="checkbox"/> Other
2. How many years have you worked for this institution? <input type="checkbox"/> 0– 2 Years <input type="checkbox"/> 3– 5 Years <input type="checkbox"/> 6– 10 Years <input type="checkbox"/> 11– 15 Years <input type="checkbox"/> 16– and more
3. In your current occupation, which of the following best describes your position? <input type="checkbox"/> Staff <input type="checkbox"/> Faculty

Table 13 (continued)

4. An active shooter is an individual actively engaged in killing or attempting to kill people in a confined and populated area.

- True
- False

5. Identify the active shooter hands-on defensive tactics (check all that apply).

- Elbow strike
- Knee strike
- Palm strike
- Bite

6. Which of the following best describes the experience or exposure that you have had with an active shooting:

- I've never heard of any
- I've heard about it, read in newspaper or on internet
- I have a friend or colleague who was involved in one
- I have a family member who was involved in one
- I was involved in one
- Other, specify: _____

7. What does the acronym OODA mean?

- Observe, Open, Decide, Activate
- Over, Observe, Do, Activate
- Observe, Orient, Decide, Act
- Open, Overt, Do, Arrive

8. Cover is an object that is capable of stopping bullets from gunfire.

- True
- False

9. Concealment is referred to an object that hides or obscures your position.

- True
- False

10. Situational awareness includes: all of the following except (check all that apply):

- Being aware of your surroundings
- Cover/Concealment**
- Objects for Barricade
- Improvised Weapons
- Being physically fit

11. Which of the following statements are true (check all that apply)?

- School shootings are rarely impulsive acts
- Typically the attacks are **planned out thoroughly in advance**
- Very few attackers have directed a verbal or physical threat to their intended targets **before the attack**

Table 13 (continued)

12. Have you ever had prior training in one of the following (check all that apply)?
- Law enforcement
 - Military service
 - Selfdefense training
 - Emergency management
13. Which of these are in the correct order?
- Hide, Run, Fight
 - Fight, Hide, Run
 - Run, Hide, Fight
14. The “Epicenter of Violence” includes all of the following except (check all that apply):
- The epicenter of violence is the most dangerous location to be in
 - Once the attacker opens fires on defenseless people the volatile area becomes the epicenter of violence
 - IHL personnel should respond to the epicenter of violence
 - The epicenter of violence generally starts with little warning
15. The first people to take action during an active shooting are faculty and staff.
- True
 - False
16. The first responders will attend to the injured people upon their arrival.
- True
 - False
17. Analysis of campus shootings has shown that multiple persons on campus had prior knowledge of an active shooting and did not share the information.
- True
 - False
18. If you see suspicious activity on campus you should call one of the following numbers (check all that apply):
- 42121
 - 82121
 - 82000
 - 4-2100
19. Typically, active shooter incidents have a duration of 2-10 minutes from onset to conclusion.
- True
 - False

Table 13 (continued)

Post-Survey Questions

1. An active shooter is an individual actively engaged in killing or attempting to kill people in a confined and populated area.
 True
 False
2. Identify the active shooter hands-on defensive tactics (check all that apply).
 Elbow strike
 Knee strike
 Palm strike
 Bite
3. Which of the following best describes the experience or exposure that you have had with an active shooting:
 I've never heard of any
 I've heard about it, read in newspaper or on internet
 I have a friend or colleague who was involved in one
 I have a family member who was involved in one
 I was involved in one
 Other, specify: _____
4. What does the acronym OODA mean?
 Observe, Open, Decide, Activate
 Over, Observe, Do, Activate
 Observe, Orient, Decide, Act
 Open, Overt, Do, Arrive
5. Cover is an object that is capable of stopping bullets from gunfire.
 True
 False
6. Concealment is referred to an object that hides or obscures your position.
 True
 False
7. Situational awareness includes: all of the following except (check all that apply):
 Being aware of your surroundings
 Cover/Concealment
 Objects for Barricade
 Improvised Weapons
 Being physically fit
9. Which of the following statements are true (check all that apply)?
 School shootings are rarely impulsive acts
 Typically the attacks are planned out thoroughly in advance
 Very few attackers have directed a verbal or physical threat to their intended targets before the attack

Table 13 (continued)

10. Have you ever had prior training in one of the following (check all that apply)?
- Law enforcement
 - Military service
 - Selfdefense training
 - Emergency management
11. Which of these are in the correct order?
- Hide, Run, Fight
 - Fight, Hide, Run
 - Run, Hide, Fight
12. The “Epicenter of Violence” includes: all of the following except (check all that apply):
- The epicenter of violence is the most dangerous location to be in
 - Once the attacker opens fires on defenseless people the volatile area becomes the epicenter of violence
 - IHL personnel should respond to the epicenter of violence
 - The epicentr of violence generally starts with little warning
13. The first people to take action during an active shooting are faculty and staff.
- True
 - False
14. The first responders will attend to the injured people upon their arrival.
- True
 - False
15. Analysis of campus shootings has shown that multiple persons on campus had prior knowledge of an active shooting and did not share the information.
- True
 - False
16. If you see suspicious activity on campus you should call one of the following numbers (check all that apply):
- 42121
 - 82121
 - 82000
 - 42100
17. Typically, active shooter incidents have a duration of 2-10 minutes from onset to conclusion.
- True
 - False
-

3.7.2 Direct Observation Framework and Content

The direct observation form includes nine different topic areas, which the researcher(s) observed and documented the participants' learning outcomes during the training exercises.

This section consists of the direct observation used by the researcher(s). The direct observation form is not included for security reasons; however, credentialed law enforcement officials will be sent a copy upon written request to sellies@pitt.edu.

This section consists of a step-by-step explanation of the direct observation form. The explanation is not included for security reasons; however, credentialed law enforcement officials will be sent a copy upon written request to sellies@pitt.edu.

3.7.3 Assessment of Participants' Hands-on Defensive Tactics

The assessment of participants' hands-on defensive tactics took place during the training. After the active shooter didactic presentation, two observers evaluated participant performance.

This section consists of step-by-step procedures for evaluating participants' hands-on defensive tactics. The procedures are not included for security reasons; however, credentialed law enforcement officials will be sent a copy upon written request to sellies@pitt.edu.

3.7.4 Assessment of How Participants Evaluated their Physical Environment

A checklist measured how well participants can evaluate their physical environment. Participants and instructors returned to participants' working environments. The instructors demonstrated the difference between cover and concealment and how to barricade their area of control properly.

The following checklist demonstrated learning outcomes participants should achieve:

- Lock workspace
- Barricade workspace
- Cover and conceal (using appropriate objects and spaces)

A direct observation form counted the number of tasks correctly performed to measure the participant.

3.7.5 Assessment of Participants' Responses to Simulated Active Shooter Situation

The assessment of participants' responses to a simulated active shooter situation was measured using a checklist as well. The participant reinforced their understanding and knowledge of how to respond to an active shooter incident by participating in a simulated exercise. The following checklist demonstrated learning outcomes participants should achieve. The participants were observed in the following areas:

- Ignore gunshots
- Move when they hear gun shots
- Warn others
- Cover/conceal
- Escape
- Fight
- Other inappropriate response (leave, become emotionally upset, joke, not take the situation seriously)

As with “evaluating physical environment,” the participant was measured using a direct observation form that counts the number of tasks correctly performed.

This section consists of step-by-step procedures for evaluating participants’ responses to a simulated active shooter situation. The procedures are not included for security reasons; however, credentialed law enforcement officials will be sent a copy upon written request to sellies@pitt.edu.

3.7.6 Inter-rater Agreement Orientation Content

The researcher trained observers. Table 14 showed the process of observer training and reliability checks.

Table 14. *Observer Training and Reliability Checks*

Step 1	Researcher will explain how to use the direct observation chart, familiarizing research personnel with the responses and behaviors to be observed.
Step 2	Researcher will provide learning outcomes of participants’ activities that represent various levels of mastery. Research personnel will rate the participants independently using the direct observation chart.
Step 3	Researcher will gather the responses and show the level of agreement of the responses.
Step 4	Researcher will discuss scoring inconsistencies and explore reasons behind different responses to help personnel achieve better consistency. The direct observation will be revised and/or clarified if necessary.
Step 5	Once consensus is achieved on the responses and researchers feel comfortable with using the direct observation chart, individual recordings of participants’ performance will proceed. Then researchers will be provided with direct observation forms to rate the participants.

3.8 DATA ANALYSIS PLAN

The data analysis plan for this study used descriptive statistics. The descriptive statistic strategy was the best approach for this study because it summarized data on a single variable (e.g., mean, median, mode, standard deviation) (Mertens, p. 405, 2010). Descriptive statistics are used to describe the basic features of the data in a study. They provided simple summaries about the sample and the measures. Together with charts and graphs, they formed the basis of virtually every quantitative analysis of data, which has been established in this study (Trochim, 2006). The descriptive statistics also presented an easily interpreted, realistic method of data analysis. Table 15 describes descriptive statistics for pre- and post- surveys.

3.8.1 Descriptive Statistics for Pre- and Post-surveys

Table 15. *Descriptive Statistics for Pre- and Post-surveys*

Item	How Reported
Gender	Percentages
Experience	Percentages, overall mean
Position	Percentage
Knowledge Questions (4-19)	Frequency, range, mean

Survey data were analyzed for changes in overall scores from pre-training to post-training, for each training offered. A repeated measures t-test was used if appropriate. Otherwise, a non-parametric measure of differences in the scores was used.

Both descriptive and inferential statistics were used to analyze the pre- and post-training survey. As for describing the data, respectively at pre- and post-training, the second item (i.e.,

year of working experience) was reported using a mean and a standard deviation. For the remaining items, frequency and percentage of each response category was reported for each item. For example, for dichotomous items (e.g., item 8-10), counts of respondents who choose “True” and who choose “False” were calculated. The counts were converted to percentages by dividing them by the total number of respondents to the specific item. For items expecting multiple answers (e.g., item 5, 11, 13), counts of respondents for each response were tabulated, and then converted to percentages in a similar fashion as for the dichotomous items.

Inferential statistics were used to examine whether there was an improvement in respondents’ gain in knowledge of how to react to active shooting by comparing post- versus pre-training. Assuming large enough sample size, paired-t test was performed on counts of the items including item 4, 5, 7-20 (16 items total) to see whether there was a significant statistical difference on the count on these items for the correct response. For instance, for item 5, count of respondents who checked all the necessary defensive tactics at post-training was compared to the corresponding count at pre-training to make such inference. The post- and pre-training difference were also be tested at the survey level (i.e., by aggregating the correct item scores). An improvement exists when the statistical test’s p-value is less than .05.

3.8.2 Descriptive Statistics for Direct Observational Measures

Each observation was described for an entire group of participants (one training session). Each training session was the result in separate data. Descriptive statistics were used: frequency, percentages, and where appropriate, means.

As for the direct observational form, inter-rater agreement (e.g., Cohen’s Kappa) was calculated first for the ratings between the two raters in order to establish evidence of acceptable

degree of agreement among raters. Then the ratings on the form were reported using descriptive statistics to summarize the count and percent of trainees who are able to 1) perform stretching exercise, 2) perform various body platforms of movement and various drills, and 3) demonstrate palm/elbow/knee strikes correctly. Moreover, the count and percent were calculated for the trainees who are able to 1) identify correctly improvised weapons, 2) fight an armed intruder correctly, 3) demonstrate learned defensive tactics, 4) demonstrate securing workspace/locking/barricade, and 5) cover and conceal workplace. Lastly, various trainees' reaction to the simulation were counted and tabulated. Table 16 describes this analysis.

Table 16. *Direct Observation Measures*

Topic	How Reported
1. Stretching	Frequency and percentage of participants who completed the stretching task.
2. Engaged/on-task	Frequency and percentage of participants who were engaged and on task.
3. Strikes	Frequency and percentage of participants who struck target with or without force, for each type of strike.
4. Improvised weapons checklist	Frequency and percentage of participants who identified at least five improvised weapons.
5. Fighting intruder	Frequency and percentage of participants who completed all three measures (PAC)
6. Active shooter scenario	Frequency and percentage of participants who either exhibited T and F (both) or PAC (all three)
7. Secure work-space	Frequency and percentage of participants who locked or barricaded themselves in their work space

Table 16 (continued)

8. Cover and conceal in work space	Frequency and percentage of participants who completed either cover or concealment.
9. Simulation	Frequency and percentage of participants who: a) ignored the situation altogether b) covered and concealed c) exited (escaped the shooter) d) warned others e) moved to a different area

3.9 LIMITATIONS

The limitations to this study are important to mention because an effective training program is paramount for IHL personnel, so that they can respond effectively during an IHL shooting. Limitations and justifications for why these confines are important to acknowledge and how they can possibly affect the study outcomes are not included for security reasons. However, credentialed law enforcement officials will be sent a copy upon written request to sellies@pitt.edu.

4.0 RESULTS

The focus of this study was to evaluate the effectiveness of a university campus active shooter training program. The methods used to analyze the data were post-surveys and direct observation. The study measured whether, after training, participants were able to demonstrate mastery of knowledge, demonstrate correct hands-on defensive tactics, conduct an assessment of their physical environment, and demonstrate an effective response to an active shooter in a simulated situation. The following section describes the participants.

4.1 PARTICIPANTS

Responses for thirty participants were collected for the survey prior to pre-training. One participant, entering the pre-survey twice, duplicated responses, so those responses were deleted. This left 30 total number of responses at pre-training. Demographic information and information about prior experience with active shooting incidents were summarized for the 30 participants. Responses from the thirty participants were collected for the survey at post-training as well. The pre- and post- surveys consisted of questions pertaining to demographic information, current work environment, and training outcomes. The demographic and prior training information was asked at pre-survey only.

4.1.1 Demographic Data on Participants

Among the participants, 10 were male (33.33%), and the rest were female (66.66%). On average, participants had worked for the university for approximately three and a half years with a SD of +1.38. The minimum time personnel worked was one year, and the maximum was five years. Seventeen out of 30 participants were staff members (56.57%), and the remaining 13 participants were faculty members (43.33%).

4.1.2 Participants' Prior Knowledge and Experience with Active Shootings

Most of the participants (21 out of 30 or 70%) had heard about active shooting events through different media sources; 4 (13%) of the participants knew someone who was involved in an active shooting; 3 (10%) participants had never heard anything about active shooting incidents. Nine (30%) participants responded to the question asking whether they had prior training in active shooting. Among the subjects who responded, no one had been trained through law enforcement. One (.03%) participant had prior training from both military service and self-defense training, while the remaining participants had one type of prior training. Specifically, one (.03) participant had previous training through military service, 5 (17%) participants through self-defense training, and 2 (.07%) participants through emergency management.

4.2 SURVEYS

4.2.1 Pre-training, Post-training, Improvement after Training

Survey data were analyzed for changes in overall scores resulting from the trainings. A repeated measures t-test was used when appropriate. Otherwise, a non-parametric measure of differences in the scores was used.

One point was assigned for each of the responses appropriately identified on items 4, 5, 7, 8, 9, 11, 12, 14, 15, 16, 17, 18, and 19. Items 5, 11, and 12 had three, four, and three correct responses, respectively, while the rest of the items all expected one correct response. With the score assignment, the maximum total score was 21. At pre-training, the group of participants had an average score of 8, with SD of 1.84. The lowest score obtained was 3, and the highest was 11 - only about half of the maximum score (11/21) obtainable from the survey.

The same scores were assigned to the same items at post-training as at pre-training. The total maximum score remained at 21 for the post-training survey. The participants at post-training, on average, had better scores than at pre-training, with a mean of 16.39 (SD = ± 2.22). The minimum score for the post-survey increased from 3 at pre-training to 11, and the maximum score was 20, as compared to 11 at pre-training.

In order to check whether the same participant had improved his or her score at post-training as compared to pre-training, participants' scores had to be matched at the different time points. Given the set-up of the survey, however, the participants were not identifiable, as they were not asked to put down their names. Therefore, matching between the pre- and post-training was performed using IP addresses instead. The same IP address at pre- and post-training was taken

to be from the same participant. While not every participant was able to be matched between the different time points, nineteen participants were identified as the same at pre- and post-training.

The difference in the scores was calculated using the post-training score minus the pre-training score for the matched 19 participants. A paired t-test was performed on the differences in the scores. The difference in the average scores between the pre-training and the post-training turned out to be statistically significant, with a mean of 8.47 ($SD = 2.34$), $t(df = 18) = 15.77$, $p < .001$. The number of participants able to identify the correct responses at pre- and post-training is summarized for each item, respectively, in Table 17.

Table 17. *Frequency and Percent of Participants Choosing Correct Response at Pre- and Post-Training*

Item	Pre-Training	Post-Training
Q4 An active shooter is an individual actively engaged in killing or attempting to kill people in a confined and populated area.	17 (.89%)	19 (100%)
Q5 Identify the active shooter hands-on defensive tactics (check all that apply).	13 (.68%)	19 (100%)
Q7 What does the acronym OODA mean?	16 (.84%)	19 (100%)
Q8 Cover is an object that is capable of stopping bullets from gunfire.	10 (.52%)	14 (.73%)
Q9 Concealment is referred to as an object that hides or obscures your position.	14 (.73%)	18 (.94%)

Table 17 (continued)

Q11 Which of the following statements are true (check all that apply)?	8 (.42%)	12 (.63%)
Q12 Have you ever had prior training in one of the following (check all that apply)?	4 (.21%)	8 (.42%)
Q14 The "Epicenter of Violence" includes all of the following except (check all that apply):	16 (.84%)	18 (.94%)
Q15 The first people to take action during an active shooting are faculty and staff.	3 (.15%)	9 (.47%)
Q16 The first responders will attend to the injured people upon their arrival.	15 (.78)	14 (.73%)
Q17 Analysis of campus shootings has shown that multiple persons on campus had prior knowledge of an active shooting and did not share the information.	11 (.57%)	19 (100%)
Q18 If you see suspicious activity on campus you should call one of the following numbers (check all that apply):	10 (.52%)	17 (.89%)
Q19 Typically, active shooter incidents have a duration of 2-10 minutes from onset to conclusion.	16 (.84%)	19 (100%)

In general, there was an increase in the number of participants who chose correct answers at post-training as compared to pre-training. The staff and faculty members seemed to have a fair level of knowledge of active shooting at pre-training, as reflected by the answers to most of the items. Items such as numbers 4, 5, 7, 9, 14, and 19 were known by the majority of participants at pre-training, while items including numbers 11, 12, and 15 were not as well-known compared to the first group of items. After the training, all of these items had increased correct response rates. Thus, the active shooter training demonstrated an increase in awareness and understanding of how to respond to an active shooter incident.

The exception to the correct response increase is in item 16, where the number of participants choosing the correct response reduced at post-training compared to pre-training.

4.3 DIRECT OBSERVATIONAL DATA

The active shooter simulation could not be rated. Rating difficulties will be discussed in a later section. Twenty-eight participants were observed during their training for appropriate responses to active shooting. Four observers rated a proportion of these 28 participants at different time points. Table 18 describes the number of observers per training session compared to the number of participants.

Table 18. *Number of Observers and Participants Per Training Session*

Training Session	Observers	Participants
Session 1	4	5
Session 2	4	5
Session 3	4	10
Session 4	3	8

During the training sessions, the observers discovered it was difficult to measure the correct amount of force when participants demonstrated the hands-on defensive tactics. The observers agreed that adequate force depended on the sound of striking the padded bag, if the instructor holding the bag moved backwards, if the instructor lost his or her balance, or if the participants left an indentation in the padded bag.

Each of the behaviors was rated as present if observed, and absent if not observed. Given the fewer number of observers versus the number of participants, certain sets of behaviors on the list were not observed. Consequently, the checklist for those behaviors was left blank so that those particular behaviors were excluded from the analysis. The excluded behaviors included “improvised weapon list,” “active shooter scenario,” “secure work space, lock or barricade,” and “cover & conceal in workspace.” The rest of the items were filled in with either a 1 indicating presence of the behavior or 0 indicating absence of the behavior.

4.3.1 Direct Observation Performance Data

Reliability was calculated for 1) stretching, 2) engaging, 3) elbow strike, 4) knee strike, 5) palm strike, 6) fight P, 7) fight A, and 8) fight C. Percent of absolute agreement was used as the reliability

index. Table 19 presents the direct observation performance data, and tables 20 through 23 show the frequency and percentage of mastery for 11 behaviors used in 4 different sessions.

Table 19. *Direct Observation Performance Data*

Task	How Reported
Stretching	Frequency and percentage of participants who completed the stretching task
Engaged/on-task	Frequency and percentage of participants who were engaged and on task
Strikes	Frequency and percentage of participants who struck target with or without force, for each type of strike
Fighting intruder	Frequency and percentage of participants who completed all three measures (PAC)

Table 20. *Frequency and Percentage of Mastery for 11 Behaviors: Session 1*

Task	Frequency and percentage of those mastering the task
Stretching	5/5 100%
Engaged/on-task	5/5 100%
Palm strike target	5/5 100%
Palm strike force	3/5 60%
Elbow strike target	5/5 100%
Elbow strike force	2/5 40%
Knee target	5/5 100%
Knee force	3/5 60%
Fighting intruder: position	5/5 100%
Fighting intruder: arm over	5/5 100%
Fighting intruder: connect wrist	1/5 20%

Table 21. *Frequency and Percentage of Mastery for 11 Behaviors: Session 2*

Task	Frequency and percentage of those mastering the task
Stretching	5/5 100%
Engaged/on-task	5/5 100%
Palm strike target	5/5 100%
Palm strike force	5/5 100%
Elbow strike target	4/5 80%
Elbow strike force	5/5 100%
Knee target	5/5 100%
Knee force	5/5 100%
Fighting intruder: position	5/5 100%
Fighting intruder: arm over	5/5 100%
Fighting intruder: connect wrist	4/5 80%

Table 22. *Frequency and Percentage of Mastery for 11 Behaviors: Session 3*

Task	Frequency and percentage of those mastering the task
Stretching	10/10 100%
Engaged/on-task	10/10 100%
Palm strike target	10/10 100%
Palm strike force	9/10 90%
Elbow strike target	10/10 100%
Elbow strike force	9/10 90%
Knee target	10/10 100%
Knee force	10/10 100%
Fighting intruder: position	10/10 100%
Fighting intruder: arm over	10/10 100%
Fighting intruder: connect wrist	7/10 70%

Table 23. *Frequency and Percentage of Mastery for 11 Behaviors: Session 4*

Task	Frequency and percentage of those mastering the task
Stretching	8/8 100%
Engaged/on-task	8/8 100%
Palm strike target	8/8 100%
Palm strike force	7/8 87.5%
Elbow strike target	8/8 100%
Elbow strike force	7/8 87.5%
Knee target	8/8 100%
Knee force	8/8 100%
Fighting intruder: position	8/8 100%
Fighting intruder: arm over	8/8 100%
Fighting intruder: connect wrist	5/8 62.5%

4.3.2 Explanation of Simulation

Observation during the active shooter simulation proved difficult or impossible in some situations, given the huge physical space in which the simulation took place, the ratio of observers to participants, and the visual obstacles for observers.

4.4 LIMITATIONS

4.4.1 Limitations of Direct Observation

With more participants to observe than observers to manage accurate data collection and multiple work sites to observe, some categories on the direct observation form were unable to be evaluated.

Specifically, the participants went to multiple work stations to show improvised weapons, perform cover and concealment, perform fighting techniques, and secure their work spaces. However, there were too few observers to go to all of these work stations. In future studies, the researcher must ensure there are enough observers to observe each participant in each situation to improve reliability.

Also, while direct observation is an effective method for teaching and learning new or difficult concepts, using direct observation as a method to evaluate learning outcomes can be time consuming, expensive, and require extended work hours. The direct observation process may pull resources from internal and external personnel to assist with arranging and setting up training sites, providing materials to collect the data, locating a meeting space, and granting permission to observe participant behaviors.

The active shooter training experienced limitations that were underestimated prior to the training. The observers found the direct observation was time-consuming, requiring approximately 5–7 hours per training session to observe and analyze the data. There was also an insufficient number of observers to observe the participants when observing items 4, 5, 7, 8, and 9. Based on the limitations discussed, modifications for future training will be addressed in the next chapter.

5.0 DISCUSSION

This research subject emerged out of the recent increase in active shooter incidents occurring at IHLs and reports of institutions ill-prepared to handle such emergencies or to respond to critical incidents. It is no longer “if” an active shooter incident will occur at our IHLs, but “when” an active shooter incident will occur. The question remains: Are IHLs prepared?

Active shootings at IHLs are not a new phenomenon. Over the past 48 years, active shooter incidents have occurred in United States IHLs, and there is no end in sight to such active shooter incidents. The literature presented a) lessons learned from preparing IHLs for an active shooter event, b) alternative measures to support IHLs in managing an active shooter event, and c) alternative active shooter training for IHLs. The evidence presented in the literature review makes it clear that IHLs can no longer depend solely on outside agencies to protect them from terrorist acts.

Institutions of Higher Learning can be prepared to face an active shooter incident on our campuses with an effective training program in place. Specifically, past and present active shooter encounters, experts in the field of law enforcement, and campus security can provide the necessary insight and training in current techniques to deal with an active shooter event in the safest and most effective way possible.

5.1 RESEARCH QUESTIONS

This study evaluated the effectiveness of a campus active shooter training program. Specifically, the research determined whether, after training, participants could:

1. demonstrate mastery of knowledge about active shooter incidents
2. demonstrate correct hands-on defensive tactics
3. conduct an assessment of their physical environment to identify how to protect themselves and others, and
4. demonstrate effective responses to an active shooter in a simulated situation.

Observations and answers to questionnaires were used as evidence of whether these training goals were met.

5.1.1 Mastery of Knowledge

The survey was an accurate research tool to capture participants' responses. The survey was successful in assessing participants' mastery of knowledge as well. In order to check whether the participants' responses improved at post-survey compared to pre-survey, the participants' scores needed to be matched. It was difficult to match the 30 participants' scores because there were no codes to match the participants' surveys. As a result, the study could only match 19 participant responses. To improve the matching of scores in the future, the participants should be asked to include their names, demographics, and prior training questions in future surveys.

In addition, fewer participants chose the correct response for question 16 at the post-training compared to pre-training. In the future, the question should be re-phased from, "The first

responders will attend to the injured people upon their arrival” to “The police will attend to the injured people upon their arrival.” Some participants may have believed that first responders are paramedics. Although item 16 did not have an increased response rate like the rest of the items, several possibilities might explain why the participants did not recall the instructions. First, most people believe that when first responders arrive at a critical incident, the first responders will assist the injured. Second, the instructor may not have stressed that this topic was as important as the other key topics. Finally, the instructor may have run out of time to discuss this topic in detail.

The original survey did not ask participants what to do if they retrieve a firearm from the active shooter before first responders arrive. An additional suggestion for future trainings will be to add an item to the survey assessing participants’ knowledge of this scenario.

Overall, the survey proved to be an adequate method to measure participants’ mastery of knowledge. The survey provided a precise instrument for data collection and an easy method to communicate with participants without having to meet with or interview each participant individually. The data were collected and easy to record through an Internet link via Qualtrics, an online survey software, computer generated system.

5.1.2 Hands-on Defensive Tactics

This section consists hand-on defensive tactics developed by the SERT. The defensive tactics are not included for security reasons, however, credentialed law enforcement officials will be sent a copy upon written request to sellies@pitt.edu.

5.1.3 Assessment of the Physical Environment

This section consists of assessment of the physical environment developed by the SERT. The assessment is not included for security reasons; however, credentialed law enforcement officials will be sent a copy upon written request to sellies@pitt.edu.

5.1.4 Effective Responses to an Active Shooter in a Simulated Situation

A debriefing session following the simulation not only benefitted the participants, but also provided additional awareness for the instructors. The active shooter simulation was a good opportunity for the instructors to learn the participants' workspaces, make suggestions on how to lock and barricade their workspace, show alternative escape routes, and examine the outcome of the simulation. During the debriefing session, both the participants and instructors participated in open discussions. The instructors provided important facts about what had occurred during the simulation. For example, the instructors provided information on how a stressful situation may make it difficult to provide the police with an accurate description of an active shooter. Similarly, the participants provided information on how they reacted to the simulation. One participant, face to face with the active shooter, decided that he had to fight. The instructors informed him that his decision was the best action to take.

Recommendations for future simulations will improve the experience for both observers and participants. For example, observers found it difficult to locate participants during the simulation. With only 3-4 observers, perhaps participants should hold their positions until the observers record their actions. This future modification would benefit data collection.

Another suggestion to improve learning outcomes is to include additional personnel to observe and evaluate the training. The additional personnel can consist of educators, law enforcement personnel, and additional volunteers to provide feedback, and make suggestions on adjusting and improving the active shooter simulation.

Finally, simulations should be exercised as a continual improvement for IHLs. Multiple simulations during the active shooter training and annual trainings improves participants' responses to an active shooter incident.

5.2 IMPLICATIONS FOR FUTURE RESEARCH

Additional research should include identifying possible active shooters before they go on a shooting spree. The pathway to violence reveals that it is possible to de-escalate an active shooter before he/she gets to stage four, the preparation phase (Simons, 2014). If someone intervenes with the active shooter, he/she is less likely to commit an active shooter incident. An active shooter sometimes displays changes in behavior prior to committing an active shooter incident. IHL personnel can be trained in recognizing changes in behavior in people. Some of the behaviors demonstrated by possible active shooters include threatening other people, purchasing or a sudden fascination with weapons and explosives, informing others of harming people, and writing or sending threaten messages. IHL personnel should review and take both written and verbal threats seriously. When IHL personnel acknowledge a threat, the threat should be investigated immediately. Early intervention can de-escalate a possible active shooter from committing a violent act. In addition, students that make threats towards others should be referred immediately

to the university counseling center. The counseling center will make the determination whether the student needs additional mental health treatment or intervention from other professionals, such as law enforcement or a psychiatrist.

5.2.1 Implications for IHL Policy

IHLs should implement active shooter policies for their institutions before an active shooter incident occurs. The policies should consist of departments participating in an annual, active shooter training. Perhaps each training session should both reinforce prior training as well as extend them. Experts in the field of law enforcement should document and conduct the training. An active shooter policy is essential for IHLs to add to their emergency response guidelines and should be updated annually.

In addition, to ensure that each department's employees participate in an active shooter training, policy should designate immediate training for new employees during the orientation process. The timely training for new employees is critical because an active shooter incident is unpredictable and can occur at any given moment. IHLs also must develop policies to include personnel with disabilities to participate in an active shooter training. The active shooter policy must be tailored to the needs of all personnel.

5.2.2 Implications for IHL Training Practices

IHLs might create an active shooter team of instructors to provide active shooter training for their institution. The active shooter team would train the university's faculty and staff on a yearly basis.

Instructors would develop a yearly schedule to train the campus, including branch campuses. The active shooter training should be mandatory and taught annually to ensure that personnel can react if faced with an active shooter situation. In addition, the training program should be evaluated yearly. It is important to re-evaluate the active shooter training annually to provide sufficient, current active shooter techniques to assist IHLs, staff, and faculty members to respond to an active shooter incident.

5.2.3 Crisis Management Policy Implications

The primary mission of any IHL is to protect, respond, and be proactive in planning and preparedness for dealing with crisis. It would benefit each department to have a role in protecting their institution's interest. Therefore, policies and procedures for an active shooter response should be created and placed in each department's emergency response guidelines manual. Adding policies to departments' emergency response plans may heighten the awareness of campus personnel and encourage them to accept and partake in an active shooter training program. In general, from past experiences, departments tend to believe that an active shooter incident cannot occur on their campus, so they often forgo training. Policies are guiding principles which each department member should know and understand. Implementing policy on what to do when faced with an active shooter incident will make the possibility of such an incident more real.

5.3 CONCLUSIONS

This research subject derived from the recent increase of active shooter incidents occurring at IHLs and research revealing that the majority of IHLs are ill-prepared to respond to an active shooter incident.

The study explored alternative measures to support IHLs in responding to an active shooter event. The measures in this study offered multiple options for IHLs to use in evaluating their training for employees. Only through providing university personnel with active shooter training can we give university personnel the confidence, knowledge, and training they will need to survive an active shooter incident.

It is my intention and hope for the future that university administrators develop and adopt an active shooter curriculum to combat an armed intruder and protect their faculty, staff, and students from senseless acts of killings.

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