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Managing Campus Shooting Incidents through Emergency Notification Systems: An Insight into the Issue of Student Compliance

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ABSTRACT

The increasing number of campus shooting incidents in the recent years has prompted campuses to develop emergency notifications systems to keep the students alert. Merely deploying mass notification systems on college campuses does not guarantee that it will be effective. Student compliance plays a very important role in establishing effectiveness of these systems. The aim of the study is to identify the factors that affect immediate compliance in active shooter incidents on campus. We use focus group interviews as the main methodology for determining these factors and examining why and how those factors affect a student's decision to comply. This paper also establishes how the intentions to comply vary among different groups of students. Results of this research contribute to developing strategies to improve the efficiency of campus emergency notification systems.

Keywords

Campus shooting, emergency notification systems, compliance, focus group

INTRODUCTION

What factors motivate students to comply immediately with messages received from campus emergency notification systems? Why do female students react to different factors than their male counterparts? How do different types of campus emergencies affect immediate compliance? This paper investigates the antecedents to immediate compliance to emergency notification.

In the recent years, we have seen a significant rise in the reporting of campus related emergency incidents. In the last ten years alone, there have been around 36 campus shooting incidents worldwide and more than 100 people, including both, students and faculty have lost their lives (Info Please, 2007). An example of one such incident that took place in Northern Illinois University where the students witnessed the most horrifying campus shooting incident in 2009. A graduate student got into an auditorium-like lecture hall with approximately 120 students and a faculty member and shot 25 students, six of whom died (Vann 2011). The university's official website reported the possibility of a gunman only after twenty minutes (Nykodym et al. 2011) of the shooting. Table 1 shows some of the recent campus shooting incidents.

Campus Shooting	Year
3 killed in the San Diego State University Shooting, California	1996
Virginia Tech Shooting, Blacksburg, Virginia	2007
A 20 year old student shot 9 students, Kuahajoki, Finland	2008
1 student killed while a teacher, another student, and a cleaning woman injured when a student opened fire at the University of Pécs, Hungary	2009
2 students killed in Mississippi State University, Mississippi	2012

7 dead after a gunman opens fire at a private Christian University, California	2012
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Table 1. Campus Shooting Incidents Worldwide (School shooting)

In addition to such incidents at College campuses, the ‘Clery Act’ has served as a catalyst to draw closer public scrutiny to on-campus incidents. There is an increased expectation that college administrators will do more to ensure student safety. As a response to such incidents and the ‘Clery Act’, many universities have implemented mass notification and alert systems as a step towards improving campus safety. Mass notification and alert systems, in its current form, are information systems that allow short text messages to be sent out to a variety of devices such as computers and mobile phones, etc. very quickly. In addition to the deployment of mass notification and alert systems, college administrators have been deploying a variety of technologies. Table 2 provides examples of such technologies that are increasingly being deployed.

Frequently Used Channels	Advantages	Challenges
Website announcement	Can reach large population; Low cost	Internet access required; Timeliness of reception of the message
Alarm (Loudspeakers, bull horns, etc.)	Low cost; High awareness in the targeting area	Can't convey instructions or other relevant information
TV and radio announcement	Can reach large population	Low timeliness; Low frequency people might check the channel
Text messaging (Campus alert)	Can target specific recipient; Timeliness	Subscription rate; Cell phone signal coverage; Words limit
Website announcement	Can reach large population; Low cost	Internet access required; Timeliness of the reception of message

Table 2. Campus Notification Systems

However, not much importance has been given to the testing of the effectiveness of these systems. Student safety is better assured only if the mass notification systems are able to communicate the alerts in a timely manner. Nevertheless, this alone may not be sufficient to solve the problem. Another very important factor responsible for the success of campus emergency response systems is the students’ intentions to comply with the emergency notifications. In addition to the timeliness and accuracy of the information, other technology limitations such as message length may not permit details to be transmitted and may result in students wanting to learn more details prior to immediately complying with the message.

LITERATURE

The IS literature has a sizeable body of papers that address the area of compliance both from an information systems audit, such as SARBANES-OXLEY ACT of 2002, etc. and also from the IS security perspective of compliance with regulations such as HIPAA, HITECH, CMS, etc. (Artnak et al. 2005; Johnston et al. 2010). From the numerous studies conducted on compliance, mostly from an information security point of view, researchers have found that several factors drive an individual’s intention to comply. Siponen suggested that employees’ IS security behavior can be improved through ethical education (Siponen 2001); Pahnla find out that employees’ attitude, normative beliefs and habits affect intentions to comply with security policy (Pahnla et al. 2007); Bulgurcu states that employee’s intention to comply with information security policy is influenced by attitude, normative beliefs, and self-efficacy to comply, (Bulgurcu 2010). From a more theoretical basis the factors relating to compliance emerge as an adaptation from theories such as Theory of planned behavior, Theory of reasoned action (Ajzen 1991), etc.

Prior research in the field of disaster response has focused on the design and effectiveness of crisis response systems (Chen et al, 2008; Dilmaghani et al. 2007). The effectiveness of the mass notification system is measured not only by the design but also by how effectively it can be used to tackle emergency situations (Gulum et al. 2009)

Students play an important role in making the designed system effective. This is different from usability - which may relate to using the system to receive the message or adoption (subscribe) that IS literature has thus far addressed. If students respond immediately to the text alerts or email notifications that they receive, they will be able to act in a timely manner and avert the disaster. Motivating students to first adopt and then to comply with emergency notifications is difficult because each

individual has a different perception of risk (Weber et al. 1997). Even if an alert message is received and understood, each student's reaction will vary. Some students comply immediately; some may verify with other fellow students and then comply, while others may not comply at all. In this research paper, compliance intention has been classified into three categories, immediate compliance, delayed compliance, and no compliance. The study uses focus groups as a methodology to not only understand the factors but also shed light on the reasons why different segments of student population are affected differently by different factors.

METHOD

Fifty students participated in nine focus group interviews that were purposed to determine the factors that affect students' compliance with campus alert notifications. Five focus groups consisted of 6 students and four of the focus groups had only five students. Student participation was purely voluntary. No incentive was provided.

1. If you get an emergency notification saying there is an active shooter on campus, will you be threatened?
2. How fast do you think, the situation can become dangerous?
3. When you get the alert message, do you comply immediately?
4. Would you verify before complying? Why?
5. What factors do you consider important that affect your decision to comply immediately?
6. Why do you think these factors are important?
7. What do you think the school needs to do to improve compliance?

Box 1. Questions Posed in the Focus Group

Each focus group session lasted thirty to forty minutes. Participants in each focus group interview were asked to reflect on a carefully prepared set of open ended questions (Box 1) asked by an interviewer. Each focus group had one moderator, and two note takers.

The focus group interview technique was selected over surveys and individual interviews because of the wealth of data that could be obtained from the group's synergy that stimulated participants to furnish details and provide alternative angles. This method gives a broader understanding of the topic which helps make more informed decisions. Through a series of well-designed questions, focus groups can often get at more honest answers and often provide more in depth information. The uniqueness of a focus group is its ability to generate data based on the synergy of the group interaction (Fern, F. E., 2001; Green et al. 2003). This exchange of ideas is not possible in case of surveys and individual interviews.

It is important to understand the limitations of focus groups. The goal of this method is not for the group to solve a problem or reach a consensus, but to consider their own perspective about the topic under discussion in the context of the others. The main idea behind conducting focus group interviews is to elicit experiences, ideas, and opinions from participants on the topic of discussion (Morgan 1997). It is a way to better understand how people feel about a particular issue and the reasons why they feel so (Krueger et al. 2009)

Recruiting Participants

Participants were recruited from the Student Union and then they were assigned to respective groups based on their gender and nationality. The number of participants in each group varied from five to six. Student selection for the focus group was entirely random but limited to students who chose to come to the union on the days we visited.

Before each interview, the participants were given a brief idea about the purpose of the research, the aim of conducting the focus group interviews and examples of active shooter incidents.

FOCUS GROUP DATA ANALYSIS

During each focus group interview, we had two observers for taking extensive notes. We had created a unique identifier to identify each participant. This helped us maintain the privacy and confidentiality of each participant. Besides this, we audio recorded all the focus group sessions. Analysis of qualitative data required attending all the focus groups, sitting together afterwards, listening to the tapes, and reading all the transcripts and notes from the sessions. We conducted the analysis soon after each focus group to enhance the quality of data. Notes were compared and the key issues that arose from each discussion were captured.

The first step towards the analysis of data is the organization of data. While reading the transcripts of notes from the focus group interviews and listening to audio tapes, we paid attention to themes students repeated and the extent of repetition, and also identified key words and phrases if several participants in a focus group repeated them, or when a participant gave his view and a considerable number seemed to agree with him. Once this was done, we created a summary report of the findings that we detail in the next section.

FACTORS AFFECTING COMPLIANCE TO CAMPUS EMERGENCY NOTIFICATIONS

The first five focus group interviews were conducted with six students in each of them. The only criterion that the participants required to meet was that they are current students enrolled in a graduate or an undergraduate program of the university. The data collected was analyzed from the focus group interviews containing a mix of these participants. This has been summarized as follows.

Mixed Groups

Participants generally felt that active shooter incidents are life-threatening, and get dangerous very soon so it is important that students comply as soon as the message is received. Students state that trust in the message and the sending party is extremely important for complying immediately without verifying from alternative sources. There are several factors that influence this trust such as awareness of the campus emergency systems, the promptness with which the messages are sent, and the accuracy of the message. The channel should send accurate messages and frequent updates informing students that the campus is now safe, or the shooter has been arrested. Emergency notification channel should be used only for real emergencies and should not be used for sending out other alerts for less severe incidents.

The messages being sent out should be written very professionally and precisely. Another cause of concern for students was that in case of other campus related emergencies like fire or gas leaks, there are specific building evacuation trainings and fire drills to prepare the students in case of an emergency. But campus shooting incidents are rare and students generally do not know how to react, so the mass notifications that are sent out should contain very specific instructions.

“The awareness of campus alert systems is important; there should be frequent mandatory sessions to train students to comply with emergency notifications.”

*“We often receive alert messages saying there was a robbery on campus, seven to eight hours after the incident has already occurred. Such notifications are useless and can't be acted upon. So now I generally ignore these alerts.”
The message should be precise and very specific, like – evacuate building and which exit to use, etc.”*

Another notable factor that affects a student's decision to comply immediately was peer influence. Many students stated that they may get affected by the people surrounding them. And they will listen to those who are important to them, such as their parents and good friends.

While analyzing the focus group transcripts, another very striking observation was made. It was observed that the importance of these factors and how they affect students' intentions to comply varied across different cultural groups and was different between males and females.

Gender Consideration

The intention to comply may differ from males to females. Many disaster response studies have determined gender as a control variable. The majority of research has established that it is more likely for women to perceive alert notifications as valid when compared to men (Bateman et al. 2002). Also, women take emergency situations way more seriously than men.

Cultural Differences

Another important variable that we consider to determine students' compliance with campus alert notifications is the difference in culture. Research shows that students' intentions to conform to the emergency notifications vary cross-culturally (Thorne et al. 2002). Culture may affect the reasoning process of individuals that may in turn affect the way they perceive the risks associated to a particular emergency situation (Moon et al. 2000). Gender may also affect the decision process.

Taking into consideration these two control variables, four more focus groups were conducted. The first one was a group consisting of all females, the second with only males. Then there was a third group comprising students with a western cultural background, while the fourth was with all international students with an eastern cultural background.

Female Group

Besides the factors mentioned above for mixed groups, females feel extremely threatened by such events. Some female students do not want to act alone, and they want to stay with the crowd. One of the female students even recalled an active shooter incident on the University at Buffalo campus a couple of years back and said,

“When I received a message, that there is an active shooter on campus, it was one of the scariest moments in my life. I did not know what to do. I would definitely not act alone, because that way I might become the target. I wanted to stay with the crowd.”

Some other students explained that, in an incident like active shooter, they don't have any experience and don't know what to do. The instruction in the message becomes extremely important. After analyzing the data for female groups, we arrived at the conclusion that females generally think active shooter incidents are rare and become dangerous very soon. They generally trust the information from the message so when they are notified about an active shooter incident they tend to panic and behave like the people around them. Normative factors become exceedingly important for this group.

Male Group

Most of the male participants are less affected by the emails or text alerts. They tend to trust the information when it comes from someone they know.

“If I receive a text alert saying someone on campus got shot, I wouldn't care much. But if my friend tells me someone who he knows got shot, that would have a greater impact on me”

For male students, improving the trust towards the channel is critical. There may be a variety of way this may be accomplished but a suggestion emerging from the focus group is that greater trust can be fostered by providing students periodic reports and some statistics related to campus emergencies and their consequences. This would make them more aware of the risks.

The following table summarizes the results we got from the male and female students.

Factors explored from Mixed Group	Male Students	Female Students
Trust in the channel/message	Trust the information that comes from the people they know. Lower trust in the message from Campus Notification Systems	They have higher trust in the channel as well as the alert messages they receive from that channel
Peer Influence	Male students generally verify from other people who they know	Tend to follow what the people around them are doing
Perceived threat	Higher level of perceived threat leads male students to comply immediately	Perceived level of threat is extremely high which makes them follow the people around them

Table 3. Summary of Results for Male and Female Students

International and Domestic Students

Both international and domestic students feel extremely threatened by active shooter incident. However, domestic students are less likely to trust the message and are more affected by the behavior of people around them, whereas international students have higher levels of trust in the alert messages sent by the Campus Notification system and mostly comply immediately. One of the international students has been quoted below.

“When we receive an alert saying there is an active shooter on campus, we immediately follow the instructions. Talking and confirming with others will just waste time.”

Hence, for improving compliance in the domestic students group, providing a timely message with clear instructions is important. Table 4 contains a summary of the results obtained from the international and domestic student group.

Factors Explored from Mixed Groups	International Students	Domestic Students
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Trust in the message/channel	Higher trust towards the channel.	Lower levels of trust towards the channel
Peer Influence	They are less like to be influenced by other people that leads to immediate compliance	They are more likely to be influenced by people around them
Perceived threat	Higher level of perceived threat leads to immediate compliance	Perceived level of threat is high but does not lead to immediate compliance. They prefer to verify from alternative sources

Table 4. Summary of Results for International and Domestic Students

DISCUSSION

In conclusion, in the incident of active shooter on campus, all groups of students found it is extremely threatening.

In almost all focus group interviews, students unanimously agreed that trust is a very important factor when it comes to following what you have been asked to do without verifying from other sources. There are several ways in which trust can be improved, such as training and education, the proper use of the channel. The way the message is written and the accuracy of information. Lack of trust leads to delayed compliance. Delay occurs students spend time verifying the details using other channels available at their disposal prior to compliance.

Also, peer influence plays a critical role when it comes to compliance. Students' friends and fellow students also have a great impact on them.

Apart from the results, that helped us identify the main factors that affect students' intentions to comply immediately to alert messages, we also received various suggestions from students that can actually be implemented to improve the emergency notification system on campus. Some of the points put forward were as follows:

- Event description should be mentioned in the subject line
- Color code the messages to differentiate the extremely severe incidents from the less severe ones
- Send the alerts in a timely manner
- The messages should be precise
- Provide "more details" specifying the scene of crime, the weapon being used by the shooter/robber
- After the event, the officials should keep the students informed of whether the criminal has been caught or is still loitering around the campus
- Security should be tightened outside the dormitories. The entry of random people should be restricted.
- There should be more cars patrolling in and around the campus

By conducting focus group studies not only were we able to determine what factors play an important role in motivating students, but were also able to arrive at why students choose to verify from other sources. Besides, getting an insight into the current emergency response system we came up with ways to make the system more efficient.

Focus groups can be used in tandem with individual interviews or surveys. Evaluators may use focus groups to initially explore issues and then seek expanded information through individual interviews. Hence, based on the results that we have got, we can now frame questions for a survey or we can interview the team that manages the mass notification system to better deploy it on campus with more number of students complying.

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