

## Emergency Text Messaging Systems and Higher Education Campuses: Expanding Crisis Communication and Chaos Theory

Recent public safety threats affecting college and university campuses during episodes of natural disasters and mass violence have exposed numerous challenges and opportunities in risk and crisis communication and have revealed how even the most well-developed campus communication plans leave room for improvement during actual crisis events. This study addresses how colleges and universities have incorporated emergency text messaging systems into their crisis communication plans, and what, if any, prevalent gaps exist between audience expectations and actual practices. Using grounded theory, the data collected in this study through in-depth phone interviews (N=10) of public relations practitioners, as well as a document analysis of media coverage of campus crises (N=36), offered a humanistic and constructivist perspective about circumstances related to emergency text message alert systems that few researchers have explored. In addition, the analysis of the data also revealed and confirmed that chaos theory can play a role as a significant theory and potentially guiding paradigm of crisis communications research.

### **Public Relations and Crisis Communications**

Within public relations, one of the most studied functions of the practice is crisis communication. For the purpose of this review, Coombs' (2012) definition of crisis works well within the context of communication-based applications of the term: "A crisis is the perception of an unpredictable event that threatens important expectancies of stakeholders and can seriously impact an organization's performance and generate negative outcomes" (pp. 2-3). The key to his definition is that crises are perceptual, affect stakeholders, it is unpredictable but not unexpected, and ultimately violates stakeholders' expectations. With a topic as broad as crisis, numerous other scholars have also weighed in to cultivate a meaningful assessment of what constitutes a crisis.

Using chaos theory as a basis for his work, for example, Seeger (2002) suggested that crisis is characterized by the ordered/disordered nature of systems and the struggle between predictability and disorder.

Although an abundance of scholarly literature exists to advise a variety of organizations on general crisis communication practices, the college and university community suffers from less research focused on the unique challenges posed by crisis events that occur within their distinct settings and numerous stakeholders. For example, Zdziarski II, Dunkel, Rollo and associates (2007) applied existing crisis communication theory specifically to the college and university setting. The concepts in their work echo the sentiment that although universities have always engaged in crisis planning and response, the high profile events that have occurred on college campuses in recent years combined with the changing landscape of available communication technologies require institutions to analyze and update existing procedures and protocols.

### **Emergency Notification via Text Messaging**

The use of text messaging emergency notification has emerged as a primary issue in the dialogue surrounding modern crisis communication (Gordon, 2007; Naismith, 2007; Shankar, 2008; Vielhaber & Waltman, 2008). A preliminary search of existing literature has confirmed that emergency notification via text messaging is an effective means of communicating some crisis-related information on college and university campuses (Gordon, 2007), but it should be used in conjunction with other traditional communication channels to increase message reception (Coombs & Holladay, 2009; Naismith, 2007). Vielhaber and Waltman (2008) asserted that regardless of the source, stakeholders expect fast, accessible information during a crisis, and new technology can improve the speed and consistency of messages being disbursed. Additional literature also provides insightful research regarding message reception among key stakeholders, audience expectations,

and the successes, failures, and misunderstandings that have occurred when new media technologies have been used in times of crisis (Coombs & Holladay, 2009; Gordon, 2007; Naismith, 2007).

Given that new technologies are often improved upon over time based on knowledge gained through actual experience, this study was designed to examine the experiences of how colleges and universities have integrated emergency text messaging into their planned crisis communication response to disseminate emergency information to stakeholders, such as students, faculty, staff, and parents, during crises affecting their campuses.

RQ1: How have colleges and universities incorporated emergency text messaging systems into their crisis communication plans?

RQ3: What, if any, prevalent gaps exist between audience expectations and actual practices?

## **METHODOLOGY**

Since its inception in 1967, grounded theory research has developed along two different but intertwined branches. This study follows the approach proposed by Corbin and Strauss (2008), as opposed to the classic or Glaserian grounded theory approach. Grounded theory has been acknowledged by numerous scholars (e.g., Charmaz, 2006; Denzin & Lincoln, 2005; Lincoln & Guba, 1985; McCracken, 1988) as a useful means of exploring new lines of research, and with little existing research conducted on the effectiveness of mass notification through emergency text messaging from the perspective of crisis communicators during times of crises, combined with the rapidly changing nature of this new technology, the grounded theory approach provided an appropriate framework for analyzing this social phenomenon.

## **In-Depth Interviews**

Primary data was collected through a series of interviews (N=10) with crisis communication professionals at U. S. higher education institutions. The interview consisted of grand-tour questions regarding community participation, anticipated bandwidth, competing text services, supplemental information, and other related issues, such as the institution's proclivity to experience certain types of disasters and crises. The phone interviews were conducted and archived using Internet call-recording software. McCracken (1988) suggested that the sample consist of at least eight interviews in order to attain a "mutual consistency" by which the data can be compared. Interviews were conducted until no new themes emerged and a saturation of categories was achieved, thereby providing evidence to later suggest theoretical implications that might explain much of the relevant behavior (Glaser & Strauss, 1967). Participants were financially compensated for their time from a university grant.

## **Sampling Strategy**

The purposeful sample of schools represented in the study included participants from several campuses publicized in national media for having already experienced large-scale crisis events. Initial participants were selected by contacting individuals from such institutions who had direct experience with either developing the campus crisis communication plan, making the decision to deploy the emergency text message system, or tactical deployment of emergency notifications. Subsequent participants were recruited using a snowball technique in which qualified peers with relevant experience were recommended by initial participants (Krauchek & Ranson, 1999). Official titles included crisis communication manger and included directors and managers of communication, news and information, media relations, emergency management, and public safety.

The sample included a balanced combination of private and public colleges and universities, as well as both those with small and large student populations. The criteria for inclusion in this study required that the institutions have an institutional size of at least 1,000 students, offer a degree-granting status of Master's level or higher, and have previous experience with deploying an emergency text messaging system to disburse campus-wide information.

### **Coding and Analysis**

The data collected in the interviews were categorized using the constructs of *open*, *axial*, and *selective coding*. Open coding, which was conducted at the line-by-line level for each transcript, offers a literal interpretation of the data and assists the researcher in abandoning preexisting mindsets by forcing every piece of data to be examined for inclusion rather than only those that conform to the questions posed from the onset of the study (Charmaz, 2006). Axial coding followed, whereby prominent themes present in the document analysis and interview transcripts were classified under larger categories by comparing common characteristics. The final stage of selective coding required a comprehensive analysis of axial codes to determine which categories achieved greatest salience, and only those with the most explanatory power were ultimately included for discussion (Charmaz, 2006).

As recommended by Corbin and Strauss (1990), the researcher systematically analyzed the data throughout the course of the interview period as opposed to upon completion of the data collection process and adjusted the line of questioning accordingly in subsequent interviews. Transcripts of the data were analyzed through the use of field notes and open coding until common themes among the data were identified.

## **Document Analysis**

A document review of coverage of the events surrounding previous natural and manmade campus emergencies was conducted to establish a general awareness of recurring themes and issues. Glaser and Strauss (1967) established content analysis as a long accepted form of research by asserting that secondary sources of literature provide a contextual understanding of the subject being studied and can lead to a preliminary, non-binding foundation of the researcher's hypotheses. As such, a document analysis of articles (N=36) from *The Chronicle of Higher Education* initially served as an introductory resource and later in the study, after interview content was coded and collected, the document analysis also helped to enhance trustworthiness and offered a triangulated approach to analyzing the data (McCracken, 1988). The researchers collected articles by conducting keyword searches on the publication's Web site using general crisis terms "emergency text messaging," "emergency communication," and "text alert," as well as institution-specific keywords naming campuses known through popular media to have deployed an emergency text messaging system during a crisis. Since this technology dates only as far back in popularity to 2005/2006, the researchers did not impose a date range limitation. Additionally, the quality of the research was ensured through multiple other approaches, including: (1) adhering to criteria of adequacy and appropriateness of data, (2) careful documentation of the audit trail, and (3) having training or experience with qualitative research.

## **RESULTS**

Many of the individuals interviewed in this study shared similar experiences and perceptions regarding the use of text messaging in various campus crises, yet their unique perspectives illustrated how effective crisis communication does not result from a one-size-fits-all approach. The

following results and discussion provide a contextual descriptive overview of broadly consistent themes and patterns that emerged in the data.

### **Campus Crisis Communication Tactics**

RQ 1 explored how colleges and universities have incorporated emergency text-messaging systems into their crisis communication plans. As of April 16, 2007, only one of the institutions represented in this study would have been able to include emergency text messaging in its response to a campus crisis, showing that Virginia Tech was not alone in lacking this new technology when confronted with the attacks that took place. However, at the time that the interviews were conducted, all ten of the higher education institutions included in this study currently had the capability to utilize emergency text messaging, along with other communication channels, to broadcast emergency notifications to its publics. To date, the interview participants reported that the average length of time that an emergency text messaging service had been implemented on the campuses studied in this project was three to five years.

#### **Influence of the Virginia Tech crisis.**

Nearly all of the study's participants referred to the Virginia Tech case during the interview, illustrating its place as a benchmark regarding the subject of modern crisis communication on college and university campuses. A communication director previously accustomed to serving in a primarily social or media relations capacity conveyed the iconic nature of this event when stating, *"the crisis communication part of my job really emerged and came to the forefront after Virginia tech in 2007, April 16, 2007, which is kind of one of those dates like Kennedy's assassination that is indelibly etched in your mind."*

One respondent specifically cited the Virginia Tech tragedy as being the impetus to seek a text messaging service for emergency notification. Another subject noted that benchmark events

such as what happened on the Virginia Tech campus force administrators to self-reflect and consider if their own plan could have adequately handled the situation: “*There was a whirlwind of text messaging companies and concern about ‘if this happens here, how are we going to protect ourselves? How are we going to notify people in a timely manner?’*” The resounding response to this discussion in this study by administrators interviewed, as well as those referenced in the document analysis, was that they could not have adequately handled the situation, which prompted the mass migration to text messaging systems.

### **Redundancy in communication tactics.**

One communication director described the university’s emergency text messaging system as being “*one very important part of a comprehensive emergency notification.*” In addition to text messaging, the institutions’ general crisis communication plans included tactics such as emails, desktop computer notifications, messages on LED display boards in common areas, sirens, emergency hotlines, and text-to-voice dialing systems. Though all institutions included in the study incorporated text messaging, this technology was not unilaterally the preferred method of sending all types of communication, and administrators choose among the channels which one is most appropriate for a given situation or for disbursing ongoing crisis related information: “*We try to encourage people, whether we’re open for business or not, to go to the university website or call the phone number.*”

Institutions contract third-party vendors to provide the software and host the system from an off-site location, and campus administrators are able to access the interface from both on and off campus locations. Some systems were set up strictly to send text messages, while others combined data points by sending texts, emails, and voice messages managed through one central console. Of the schools that reported using a text-only system, their reason for doing so was to limit the volume



of outgoing messages from any one system so as not to slow down the delivery speed. One administrator supported this mindset in saying that *“the text alerts are so important. We just don’t want one to interfere with the other.”*

### **Subscription rates among institutions.**

While the estimated participation rates regarding the number of subscribers at each institution varied from 25% to 99%, all of the communication managers expressed satisfaction with the percentage of eligible recipients that were subscribed to their alert system, stating that the other layers of communication tactics would safeguard the participation gap. One participant observed that notable crises occurring on campuses often serve as an impetus to boost subscriptions to text messaging services, stating that the communities react to situations with which they can relate: *“It will grow every time there’s an incident on campus, you know. And especially if it’s something fairly serious, like an assault or something and there is something that goes out. Usually the registration will jump, because people, well, you, know, it’s more on their mind. It raises awareness about what emergency notification can do.”*

Responses regarding efforts to solicit new subscribers heavily favored new students, staff, and faculty members, as most subscription campaigns occurred during new student and employee orientations. Administrators rationalized this decision in a variety of ways: *“We’re probably not as comprehensive in trying to get them to sign up. There are reminders sent out several times per year for them to do that, but it’s not as aggressive as with the students.”* Though two schools integrated a data collection form into the online course registration process, the data indicated that most schools displayed a tendency to become complacent with subscription rates and recruitment methods beyond campaigns held during the system’s initial introduction on campus or at orientation, and somewhat neglected returning prior stakeholders.

### **Data management.**

The schools included in this study reported mixed methods and frequency of purging and cleaning data to promote the integrity of the database. Multiple schools reported purging data each year after graduation, but they consider several factors beyond graduation lists and cannot simply remove students from the system based on one factor, since some students transfer or drop out, while some recent graduates remain on campus to continue taking classes.

The ramifications of reducing the number of records in the database were directly related to system performance, as one communication manager noted:

*I know for a fact that the more people register, the more numbers, the more destinations that a message is going to, the slower the delivery. And that can be a problem. We've had messages sent out that get hung up because you not only have outgoing traffic with cell phones, but you have incoming. You've got people calling the campus, calling their son or daughter, and you get this whole huge convergence of activity and the communication can break down. And it can slow up delivery of those messages. So volume is a problem.*

Administrators attempted to crosscheck registration records over an average of one year before purging an inactive record to ensure that the student has actually severed ties with the institution and that students expecting to receive alerts remain included in the notification. They also reported that employees are easier to purge since their exits are processed routinely through the human resources office. Other issues cited were typographical errors in the phone number field, changing numbers, and inclusion of off-campus parties such as parents and significant others.

### **Audience Expectations**

RQ 3 asked what, if any, prevalent gaps exist between audience expectations and actual practices. Since actual students, staff, and faculty members not affiliated with the crisis response

team were not included in the interview sample, the results for this question were derived from data collected in the document analysis as well as perceptions of the phenomena noted by the crisis managers obtained during the interviews.

### **Establishing reasonable audience expectations.**

Evidence from the document analysis as well as the interviews illustrated that the Virginia Tech event was often recognized as the modern catalyst that changed people's expectations of what information should be available in response to campus emergencies and how it should be provided. Paired with the popularity of this medium among students, one administrator noted, "*Students coming out of high school expect to receive text messages because that is what they are used to.*" Several interviewees noted that the modern public discourse on campus crisis communication seems to revolve around text messaging:

*The public needs to get out here and understand is that text messaging isn't the panacea to make you safe in all circumstances. It sort of scares me to think that when the public lay discussion of emergency notification occurs, it all goes back to text messaging, as if that's the only way that people are going to be saved, and that couldn't be farther from the truth.*

Of the crisis managers who actively engaged the community in establishing reasonable expectations, such tactics included sessions at new student and parent orientations, email communication, descriptions on the subscription webpage, as well as instructions during testing.

### **Ambiguity in the Clery Act.**

Several participants indicated that determining what is classified as a "*serious emergency*" has proven to be difficult. The vague nature of the notification guidelines set forth by the Clery Act has contributed to the inconsistencies in determining when to deploy emergency text messaging systems versus other communications channels, and in turn has exacerbated the gap between

audience expectations and actual practices. One interviewee stated that although the legislation's key phraseology defines "*timely warning*" and "*emergency notification*" as distinct components, the guidelines don't essentially clarify what is the difference.

The general sentiment of the communications managers questioned in this study was that the text messaging system should be limited to use during true emergencies in order to make bigger impact upon the audience in a life or death situation, but the cumulative data indicated a great deal of variance in the scope of what circumstances administrators believe constitute a true emergency. Noting that other channels may be more appropriate to send out Clery Act warnings, one administrator stated, "*we only use it for episodes where there is a potential immediate threat to health and safety. We don't use it for instance for Clery Act warnings.*"

### **Complaints and perceptions.**

Analysis of the data revealed that complaints in recent years are less about technology failures than they are about communication response decisions; specifically what information is included in the message and when the institution elects to send them. While most people were grateful to receive the alerts, others complained about text messaging administrators sending out too many messages during ongoing situations such as severe storm activity: "*There have been some people that have been annoyed with the text alerts because they don't want to get them in the middle of the night, or there are times that they are off campus and it doesn't affect them.*"

To the contrary, administrators also received complaints for not sending messages during certain events or to specific audiences. One participant defended his position in not sending out a weather-related campus closure notification when stating that "*our responsibility is to put out information for people to take precaution for their safety, not to cancel classes for a weather related event.*"

In addition to an expectation gap in what messages should be sent, the public perception of emergency text messaging's performance is often based on a lack of understanding of the technology, and opinions regarding its inadequacy are often incorrect. An administrator of a system with 40,000 subscribers noted, *"the assumption is that the text message is instantaneous, and if you really analyze the technology and the flow and the data and the size, it can be challenging. And again, at a small liberal arts college with only 2 or 3,000 people, text messaging's going to be way faster and it may be a better option."*

Interviewees stated that because audiences are so comfortable with traditional text messages, they incorrectly impose the same standards of performance upon emergency notifications, feeling as though it is the same as sending text messages between friends. *"The end users expect the text message to arrive immediately because they're accustomed to texting their friends and having it arrive immediately. They're not texting 30,000 of their friends all at once, but nevertheless when we've done testing and asked for feedback on whether or not it took too long, we start getting complaints one minute after it went out."*

### **Theoretical Implications**

Through selective coding, the researchers determined and have already discussed the primary themes present in the data describing the situational nature of crisis communication. However, during the process of axial coding, the researchers observed several additional key themes recurring frequently among the data that bore specific resemblance to chaos theory, which has recently begun to be explored more often in public relations research.

#### **Chaos Theory and Crisis Communication**

Even the most rigorously prepared crisis plans remain vulnerable to unforeseen variables, and results from this study demonstrate the value of using chaos theory in studying crisis

communication to address the gap of communication research that exists between existing pre-crisis and post-crisis communication research. As a study participant summarized his experience with crisis planning by stating that despite repeated testing and planning, *“you can’t eliminate the sort of chaotic element entirely in any emergency because there’s just a whole lot going on. But you can manage it and control it in a way that people can get useful information.”*

The roots of chaos theory originated from a meteorological study in which weather patterns were discovered to not always develop as scientific models predicted and did not repeat their previous history, despite being studied over long periods of time (Lorenz, 1963). In his subsequent studies, Lorenz (1993) sought to prove that small amounts of randomness existed within moderately predictable systems and that even traditional scientific research of common phenomena are still studies of approximations. Lorenz (1993) distinguished a deterministic sequence, in which only one outcome is possible, from a random sequence, in which several possible outcomes may exist, but he also noted that randomness does not necessarily predicate that an infinite number of possibilities exist. In this sense, Lorenz advanced chaos theory from claiming absolute unpredictability and made it useful to the scientific community by acknowledging that degree of predictability can exist within a relative set of unpredictable circumstances.

### **Chaos theory and crisis communication.**

As a crisis event unfolds, information and circumstances regarding the ongoing situation change rapidly. Due to the innumerable variables governing a situation, a finite course of action is often impossible to predict (Gilpin & Murphy, 2010). Recognizing that predictability and precise planning is counterintuitive to the erratic nature of crisis, chaos theory has emerged as a potentially prominent theory in crisis communication literature (Coombs and Holladay, 2011; Cottone, 1993; Freimuth, 2006; Horsley, 2010; Murphy, 1996; Seeger, 2002; Sellnow et al., 2002; Vanderford,

Nastoff, Telfer, & Bonzo, 2007). Seeger (2002) asserted that the flexibility afforded by chaos theory complements crisis situations, which are typified by a series of complex non-linear systems.

The participants interviewed in this study demonstrated recognition of these principles in their preparation for emergency communication on campus in their emphasis on a multi-layered communication plan, as well as the inclusion of pre-scripted message templates. One manager described a plan in which *“we have various crisis situations mapped out and we have different types of responses and media that we will use throughout the course of a crisis, two, three, whatever. And text messaging figures in as one of those pieces. It’s not the only one. It’s not used for everything.”* By preparing for several different likely outcomes related to a potential crisis, crisis managers are better prepared and able to manage the chaos by providing a general deliberate framework within which to accommodate the unpredictable variables.

A participant in this study echoed Seeger’s assertion when referring to the challenge of channeling prior experience and preparation to make sound decisions during a crisis: *“In every situation, there is going to be a time of chaos, and chaos comes from not knowing. You don’t know the facts. We err on the side of caution because we figure that the inconvenience is worth keeping people as safe as possible. The period of chaos is really apt observation and cannot be prevented, because there are going to be times when you don’t know all the facts.”*

Chaos theory acknowledges that even the most stringent testing will not account for every possible variable, and in crisis situations, in addition to all of the situational variables that occur during a crisis, human error adds an additional level of complexity to an already unpredictable situation. Referring to an instance in which a text message was delayed, one administrator described momentary panic that ensued while not being able to log in to the text messaging system because the caps lock had been left on by a previous user: *“You don’t think about those things when you’re*

*testing monthly. It's sort of automatic what you do. But in a real life crisis situation, your adrenaline is going and you're not thinking clearly."*

### **Bifurcation and emergent self-organization.**

Lorenz (1993) contributed fundamental legacies through his work on chaos theory with his concepts of bifurcation and emergent self-organization. Each of these terms can be seamlessly applied within crisis communication research as they address the essence of the realities experienced by an organization in crisis, as identified in this study. Lorenz referred to bifurcation as the abrupt event or change in a system that, in the case of crisis communication, throws the organization into a state of emergency. Horsley (2010) maintained that bifurcation shifts from normal organizational operations into deployment of the crisis plan, in which the traditional hierarchy is replaced by a disaster response structure.

Obvious examples of bifurcation points in the data included the emergency events that triggered a crisis response, such as tornadoes, hurricanes, ice storms, active shooters, and chemical spills, all of which shifted the institutions from normal operating mode into a restructured organization hierarchy and value system designed to address the altered roles and functions necessary to address the crisis. However, on a larger scale, the benchmark events of Virginia Tech can also be viewed as a bifurcation point for the field of campus crisis communication as a whole, in which institutions departed from complacency with existing procedures and were forced to reflect upon the adequacy of their own practices.

Higher education institutions' reaction to the this self-reflection embodies Lorenz's concept of emergent self-organization, which was described by Seeger (2002) as "a natural process whereby order re-emerges out of the chaotic state brought on through bifurcation" and "characterized as the antithesis of chaos" (p. 332). The data analysis revealed that within six months of the Virginia Tech



shootings, hundreds of institutions had contracted third-party vendors to provide emergency text messaging systems on their campuses (Foster, 2007). Interview results, mentioned in greater detail in the results section, support the idea that the mass-migration to this technology was motivated by analysis of the tragedy with statements such as: “*The spotlight is shined more brightly on campus safety as higher education lost its innocence in 2007, and rightly or wrongly, fairly or unfairly, Virginia Tech is the bellwether pole on all of this stuff.*” The bifurcation point of the Virginia Tech crisis and emergent self-organization of the higher education community in its willingness to adapt existing procedures offer explanatory power to an area of crisis communication that public relations scholars have just recently begun to develop, and they provide an excellent transition into the more common lines of research aimed at directing organizations upon the conclusion of a crisis.

## **CONCLUSION**

The cumulative opinion shared among communication managers interviewed for this project emphasized the concept that the chaotic and nonlinear events that occur during active states of emergency necessitate redundancy and breadth in an organization’s communication response to be able to adequately react to the situational variables that arise. Overall, the data collected in this study explain how higher education institutions utilize emergency text messaging systems to disburse crisis-related information for immediate and ongoing threats to public safety. Although this technology has garnered much recent attention among the lay community as being the premiere method of broadcasting emergency notifications, the participants in this study indicated that it is an effective addition, but not a replacement, to existing traditional communication channels. While text messaging may have its shortcomings in certain scenarios, the professionals interviewed in this study did agree that when all factors, including system performance, audience expectations, and

reach are considered, it can be one of the most effective crisis communication methods of ensuring that the message is received and processed by a large amount of people in a short amount of time.

### **Limitations and Future Research**

While acknowledging that the flexible analytical framework of qualitative research reduces precision, Sellnow et. al. (2002) asserted that the study of the chaotic nature of crisis, imprecise in and of itself, is well served by a similarly non-linear approach to data collection and analysis. Also, some limitations are related to only focusing on the organizations' perspectives.

As is typical when conducting grounded theory research, the researcher observed a number of additional phenomena and related issues during the course of this study that warrant future research. First, there is a clear need to conduct empirical studies on system performance to address the questions that remain regarding volume, speed, and message reception, and third-party deliverability performance, including participation from both system vendors as well as mobile service providers. Third, we need to seek further clarification of the Clery Act. Multiple study participants indicated that their emergency responses are often influenced by the fear of unintentionally violating the legislation since there is no consensus on when and how to comply. Although evidence found in the document analysis revealed that recent amendments to the legislation focuses on "getting out the warning as quickly as possible, even if you don't have all the facts" (Lipka, 2012), the practices demonstrated by participants in the study indicated a great deal of variations in interpreting which events qualify for the warnings.

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