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College students are connecting with peers and college administrators in different ways in times of crisis. Lessons learned from the impact of Hurricane Katrina and the mass shooting at Virginia Tech have shifted the methods of response in the event of campus crisis to newer technologies.

Technology Use in Campus Crisis

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The stories of attacks, deaths, fires, natural disasters, and criminal activity at colleges and universities make headlines on a regular basis. When a college student goes missing, the media often report a lurid story that also includes the reaction of that student's institution of higher education. It is more than just the families or neighbors who are involved: the classmates, instructors, and residence hall dwellers of the victim are also sought for comment.

When the incident occurs on the college campus, the ability of the institution of higher education to manage the problem—from prevention to reaction—is examined. Recent crises at various college campuses across the United States, including massive hurricanes, active shooters, and murders, have tested the emergency plans of those institutions.

But who is responsible for managing a crisis? Various aspects of responding to crisis fall to several departments within the institution of higher education, including media relations, university police, the president, student affairs professionals, and beyond, depending on the incident. Colleges and universities have a unique community made up of students, faculty, and staff, as well as the parents of students, who are increasingly involved on college campuses. It is necessary for all of these constituencies to be involved in crisis communication (Rollo and Zdziarski, 2007).

The expertise of senior student affairs officers (SSAOs) has been used in managing fires, car accidents, student protests, and student deaths, in addition to other crises. Higher education in the United States has largely created the role of the SSAO to support the academic mission of a diverse

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range of colleges and universities aimed at educating students outside the classroom. Student affairs is often the unit responding to the crisis in a counseling role or working directly with the students and parents (Sandeen and Barr, 2007). Each institution has some version of a crisis management plan, and often the role of the SSAO is crucial in implementing that plan (Cherrey, 2006).

The evolving technologies for communication are creating new challenges and opportunities for SSAOs and other campus officials in times of crisis on campus. Regardless of the role of technology or its evolution, crises will continue to occur on college campuses. The arrival of the Internet and electronic communication provides an entirely new way to share information and alert individuals, giving the institution of higher education additional opportunities to connect to its campus community. At the same time, the expectations of instant information with electronic communication have risen to a challenging level.

The 1990 Clery Act requires colleges and universities only to issue "timely warnings" of reported criminal offenses that present an ongoing threat to students and employees. The timeliness of the communication is considered to be a crucial part of the crisis plan in relation to the use of technology. The more quickly the information is distributed, the more successful the communication is; at the same time, the information must be accurate, or the message could be misleading, insignificant, or incorrect (Hoover and Lipka, 2007).

After the arrival of the Internet in the 1990s, the typical mode of communicating to the campus community shifted to an electronic format: information can be posted on a Web page, sent in an e-mail, or sent in a text message on a cellular device. Some of those methods are quick or inexpensive, but they are not foolproof ways to reach the intended audience. Hurricane Katrina and Virginia Tech are two examples of crises where campuses used technology to communicate with their constituents and improvements were recommended afterward to improve that communication. Although information can be shared much more quickly than in a traditional method such as regular mail or the media, the challenge of being able to notify the campus instantaneously still exists. This chapter examines how technology has been used in crisis situations and how it can best be used in the future.

Campus Crisis and Crisis Management

Zdziarski (2006, p. 5) defines *crisis* as "an event, which is often sudden or unexpected, that disrupts the normal operations of the institution or its educational mission and threatens the well-being of personnel, property, financial resources, and/or reputation of the institution" (p. 5). A negative event or outcome, the element of surprise, limited response time, disruption of operations, and threat to the well-being and safety of people are all hallmarks of a crisis (Rollo and Zdziarski, 2007; Zdziarski, 2006).

The perception of the event by student affairs staff, their ability to respond, and the organizational structure and culture of the institution all affect the impact of that crisis (Rollo and Zdziarski, 2007). The differences between types of institutions (such as rural versus urban, public versus private, research university versus liberal arts college) affect the impact of such a crisis on a college campus as well. For example, a college located in an urban area has neighborhoods located adjacent to the campus, providing a different context for pedestrian and automobile traffic, a higher level of violent activities, and criminal activities taking place in the city itself. Philadelphia's Temple University and the University of Pennsylvania are located in the city's urban core, and incidents taking place on and off campus have an impact on the campus communities on a regular basis. The communications director at Temple University stated, "Campuses like Temple are part of the city. While we think a lot about security on our campus and the neighborhood around us where students live, we're also concerned with what's going on in the city around us" (Hartmann, 2007). A rural campus might have the ability to secure the perimeter of campus easily or quickly communicate with its students who are not necessarily scattered throughout a city. Regardless of the type of institution, each must examine its communication with its constituents and determine the best course of action to reach them, whether using text messaging, signs on the perimeter of campus, a PA announcement system, or other means.

Higher education relies on the ethic of care for its responsibility to respond to crisis. In the case of a crisis, the public at large expects college or university staff to reach out to its constituencies with compassion, concern, and sensitivity to the situation in a timely manner. The level of obligation by the college or university, as well as the role of the parents, the local community, and the state in students' lives, are continually being refined (Sandeen and Barr, 2007). Sandeen and Barr (2007) indicate that the factors of the changing demographics of students, the legal environment, financial support, and barriers such as special interest groups, a sense of entitlement, and unfunded mandates all factor into the decision of who has responsibility for the lives and welfare of students on campus.

Traditional-aged college students, the Net generation, have new expectations of their campus community. As the generation that grew up when the mass killings at Columbine High School took place and witnessed the terrorist attacks of September 11, 2001, on their television sets, today's students have an expectation of safety and security when they arrive on campus that is very different from that of previous generations (Junco and Mastrodicasa, 2007).

The shift to a much closer relationship between today's college students and their parents has had a further impact on colleges and universities, causing a shift in parental involvement: today, more parents at the college level than in the past have become involved with their students' college lives. There is a proliferation of materials in student affairs discussing the greater role of parents in their students' lives and college education. Parents frequently contact colleges and universities on behalf of their students,

attempting to resolve issues ranging from grades to roommate disputes (Keppler, Mullendore, and Carey, 2005; Junco and Mastrodicasa, 2007). Parents of traditional-aged college students expect their students to be protected while they are on campus, and in the case of a crisis, their student's safety is of immediate concern.

The legal relationship between the institutions and students or parents is constantly being reexamined (Rollo and Zdziarski, 2007). As federal law, the Family Educational Rights and Privacy Act (FERPA) protects the disclosure of educational records of college students without their consent, including to parents or other outside entities. Traditionally this meant that grades, judicial records, or counseling records were restricted and private as part of the student's education record. However, the latest interpretation of FERPA from the U.S. Department of Education specifically provides that FERPA allows colleges and universities to take "key steps to maintain campus safety," such as disclosing educational records to protect the health or safety of students or other individuals, without the student's consent in the case of an emergency (U.S. Department of Education, 2007). Similarly, FERPA allows institutions to disclose information to parents from education records without the student's consent if there is a health or safety emergency involving their student (U.S. Department of Education, 2007).

An institution's actions, the results, and an examination of their effects set the stage for refining responses to future crises. All crisis events allow for learning valuable lessons in improving prevention, management, and responses for the future. In addition, they can demonstrate how communication and media relations were successful and where improvements are needed. There are several events throughout history that Rollo and Zdziarski (2007) include in their list of examples of campus crises that can be studied and used in developing crisis management plans, which include assaults, murders, mass killings, and natural disasters. Each example required administrators to identify how to best communicate with the campus community, as well as to the general population, in addition to assisting those directly affected. Two recent incidents of a large magnitude have had a great impact on the issues of communication in the case of campus crisis: Hurricane Katrina in 2005 and the shooting of more than thirty people on the campus of Virginia Tech in 2007.

In managing crisis, the speed of disseminating critical information to the various constituencies (students, faculty, staff, law enforcement) is the primary factor in determining how well the institution reacted (Rollo and Zdziarski, 2007). The crisis communication plan should include a well-thought-out strategy for getting the information out as quickly, systematically, and efficiently as possible (Lawson, 2007; Lipka, 2007). In addition to the need for instant information in the case of immediate safety needs, the Net generation expects technology to be used to share the information as quickly as possible (Junco and Mastrodicasa, 2007).

Beyond the students (and their parents) are numerous others who require information about crises: faculty and staff on campus; legislators, donors, community leaders, relatives, and friends of victims; media, partners, and stakeholders with a significant relationship to the institution; funding and granting agencies and organizations; and the general public (Lawson, 2007). There are many ways a campus can relay information about a crisis to its various constituents, especially with developments in communication technology. The Internet was just the beginning of a new era of technological communication, and the use of tools such as e-mailing, blogging, and text messaging has begun to dominate the means of sharing information about crisis.

Media Impact on Campus Crisis Communication

A shift in media in the 1990s had a tremendous impact on the reporting of crises and the need for rapid communication during such events. Previously newspapers, radio stations, and television stations had covered local stories and subscribed to wire stories from a national affiliate to share news. The role of the media in society has shifted with the development of around-the-clock television news channels, political talk shows on radio and television, Internet or other forums for people to discuss news with each other, satire news shows such as *The Daily Show with Jon Stewart* and *The Colbert Report*, and Web sites providing constantly updated news. Now, information through the television, radio, computer, e-mail, cell phone, and other devices is constantly and instantly available, discussed, and debated. In addition, images or sounds recorded by witnesses are becoming shared almost instantaneously with cell phone and other media recordings.

The so-called CNN effect was identified in 1990: twenty-four-hour news coverage accelerated the policymaking process, requiring faster decision making and action to prevent the appearance of a lack of leadership in any crisis (Brookings Institute, 2002). As a result, television coverage of any crisis can be persistent, repetitive coverage of graphic video, and institutions are hard-pressed to respond as quickly as possible. Furthermore, information about events that might have made only the local news in a previous decade now make national or international news. The images shown on television shape the perception of the event and the response.

The 1990 student murders at the University of Florida were a prime example of the CNN effect. At the beginning of the fall semester, the bodies of five murdered college students were found in the college town of Gainesville, Florida, over five days. As the police worked to track the apparent serial killer in the community, the widespread media coverage caused panic for those in the town as well as statewide. For the next two weeks, repeated coverage showed video of bodies being removed from apartments, sensationalized discussions took place on talk shows, and attempts to stop rumors of further deaths by law enforcement ruled the

airwaves. The coordinated responses by the university were able to demonstrate concern and support and eventually set the stage for operations to return back to normal on campus within the academic year (Rollo and Zdziarski, 2007).

Media coverage of a similar caliber at the University of Wyoming of a gay student who was killed became an opportunity for the public to offer its support or criticisms using the Internet. Thousands of e-mails overloaded the servers at the institution, creating essentially a denial-of-service attack on the university network, which is an attempt to make a computer resource unavailable to its intended users by an overload of input or other frequent external communication requests such that it cannot respond to legitimate traffic or responds so slowly as to be rendered effectively unavailable. The staff at the University of Wyoming were unable to respond on its Web site or using e-mail as a result of the intense attention for those feeling a need to express their electronic sympathy with the student's parents or to express hatred and bigotry toward homosexuals (Rollo and Zdziarski, 2007).

The advent of cellular phone technology displayed its strengths and weakness in a tragedy at Texas A&M University in November 1999. The news of the collapse of the annual bonfire spread quickly throughout campus and even through the state of Texas, and the interception of communications between students and among the staff at Texas A&M caused information to be released prior to notifying the families of those injured or killed. Similar to the University of Wyoming, the e-mails and telephone lines were overwhelmed, and Texas A&M student affairs staff were unable to respond effectively or in a timely manner (Rollo and Zdziarski, 2007).

Television coverage has continued to serve as an impetus for response during crises, but as technology has evolved, there has been the opportunity for those involved to contribute their own viewpoint or images to the news media. Video clip content can be shared through the Internet, using e-mail, instant messaging, blogs, or other media Web sites including YouTube, and can gain instant popularity in the phenomenon of viral video. The proliferation of camera phones as well as the availability of cheap video editing and publishing tools has allowed citizens to record and distribute video images quickly and easily ("Viral Video," 2007). Television news channels such as CNN, Fox, and even The Weather Channel invite viewers to submit videos to their stations for broadcast. The shootings at Virginia Tech in April 2007 were recorded by witnesses with cell phones and sent to the news media, providing firsthand coverage for the entire world to see (PBS, 2007).

Communication Using New Technology

The advent of high-tech methods of communication has provided new ways to reach our students. The methods are constantly evolving with user preferences.

E-Mail. E-mails tend to be one form of communication on a college campus, but e-mail relies on the assumption that the recipient is checking and reading the e-mail. E-mail is vastly preferred (85.1 percent) by students as their primary means of communication with the institution, even though they are also demonstrating interest in more instant forms of technology (Salaway, Caruso, and Nelson, 2007). Now, students are using e-mail less frequently than in the recent past to communicate with each other and are not checking it as frequently as they are checking messages on social networking sites, their text messaging systems, and instant messaging systems for communications with their peers (Carnevale, 2006).

One criticism of the Virginia Tech response was the use of e-mail to communicate the threat on campus more than two hours after the shootings rather than using a quicker method (Lipka, 2007; Sink, 2007). The shootings took place early in the morning on a weekday, and the university sent the first e-mail out to the campus community at 9:36 A.M. (PBS, 2007). Students are interested in seeing faster and more effective means of communication under emergency conditions as a result of crises like that at Virginia Tech (Salaway, Caruso, and Nelson, 2007).

Two other examples of college campuses using e-mail to communicate demonstrated the lack of timeliness in using e-mail, whether in its sending or receiving. In November 2007, the University of Chicago administration sent a detailed e-mail message informing the campus community about shootings on and near campus that had taken place the night before. Many criticized the message as not being timely enough, although the reason for the delay was that the administration was being cautious in gathering the facts about what had happened. The campus had access to an emergency text-messaging system, but because the shootings had happened in the middle of the night, the administration did not consider using it (Hoover and Lipka, 2007).

Another example was a bomb threat in October 2007 at the University of Minnesota that was e-mailed to the general police e-mail account. The e-mail was sent at 11:46 A.M. and was read shortly after 4:00 P.M. That e-mail account is checked one or two times per day, and usually the inbox consists of a couple of legitimate police-related e-mails, and the rest are spam. An automatic reply goes to all e-mails and says to call 911 in case of an emergency. The police did clear the building and follow protocol for the bomb threat once it was discovered (Weinmann and Horwath, 2007).

Text Messaging. Text messaging is the use of cell phones or other cellular-enabled devices, such as handheld devices, to send and receive short messages (Junco and Mastrodicasa, 2007). Research shows that the vast majority of college students own a cell phone (Frank, 2007; Junco and Mastrodicasa, 2007; Mastrodicasa and Kepic, 2005). Salaway, Caruso, and Nelson (2007) found that about a third of the student respondents like to learn information through text-based conversations over e-mail, text messaging,

or instant messaging. The prevalence of cell phones among college students is expected to remain steady or continue to increase with the number of services becoming available for cell phones.

The technology of text messaging has interested colleges and universities searching for an efficient and effective way to communicate with the campus community in an emergency situation (Salaway, Caruso, and Nelson, 2007; Foster, 2007; Frank, 2007; Junco and Mastrodicasa, 2007). The ability to instantly notify campus community members, who may not be sitting at a computer to check e-mail, provides a new advantage. By broadening the scope of methods of mass communication, such notification systems are considered to be the next step in integrating technology as part of campus crisis plans (Foster, 2007; Rivera, 2007; Sink, 2007). Some campuses are developing these systems internally, but many more are finding opportunities to partner with existing technology companies to provide these services on campus.

Despite the apparent advantages of being able to communicate instantly by text message, there are drawbacks to the systems. The nature of the technology is not as instantaneous as one might assume—for example, one text messaging company can send its messages out at a rate of eighteen hundred per minute; therefore, it would take approximately thirty minutes for notifying more than fifty thousand students, which is quite long during an emergency situation (D. Kratzer, personal communication to the author, November 2007). Another drawback to the text messaging notification systems is that the perpetrator, as a subscriber, might receive the text alert too—and the message might send him or her to places where students might be hiding (Frank, 2007).

After the shootings at Virginia Tech, hundreds of colleges began considering the implementation of emergency text messaging notification systems. For example, the state university system in Florida was looking into implementing text messaging at all eleven of its campuses, and it has provided grant funds for campuses to upgrade their emergency systems (Frank, 2007). Although some notifications could be as benign as alerting students during a power outage, as happened at the City University of New York's Bernard M. Baruch College, more serious situations have required their use (Foster, 2007).

Campuses are finding that Net generation students are willing to voluntarily participate in sharing their cell phone numbers for an emergency notification system in the interest of safety (Foster, 2007; Frank, 2007). In fact, students are comfortable giving up more freedoms than any previous generation in the interest of safety, as a result of the Columbine era and 9/11 (Junco and Mastrodicasa, 2007). For example, Penn State had more than sixty-two hundred people sign up for their voluntary text messaging system in one week in April 2007 (Frank, 2007), and the University of Delaware has more than ten thousand cell phones subscribed to its system with a private carrier (Rivera, 2007).

At St. John's University in Queens, New York, administrators in September 2007 used a text messaging system to inform faculty and students of a gunman on campus. After learning the perpetrator actually carried a gun, a notice by text messaging went out in minutes, and the gunman was arrested six minutes later. The university administration credits the text messaging system for directing students on campus to safe locations (Rivera, 2007). A similar message went out at the University of Colorado at Boulder when a student on campus was stabbed by a former cafeteria employee. It was the first day of classes, and only thirteen hundred people out of twenty-eight thousand students were signed up for the emergency text messaging system. Within the next five days, nearly eight thousand students had signed up for emergency text messaging notification (Sink, 2007).

In December 2007, Louisiana State University used its new emergency notification system to send text messages to approximately eighty-four hundred students after two graduate students were shot to death on campus. However, an undetermined number of those messages never arrived due to a technical problem (Young, 2007).

Social Networking Web Sites: Facebook and MySpace. The social networking Web site Facebook has become one of the most popular sites, especially on college campuses, ranking as the top photo site on the Internet and maintaining an 85 percent market share of four-year American universities (Facebook, 2008; Junco and Mastrodicasa, 2007; Sadler, 2007). Activities on Facebook include posting profiles, connecting to friends and others, creating and joining groups, advertising items for sale, and playing with the new applications created frequently for Facebook users (Sadler, 2007).

Junco and Mastrodicasa (2007) found that 68.5 percent of students in their Net generation survey had Facebook accounts and usually logged in twice per day. Because of the heavy use on college campuses, many colleges and universities use Facebook as a means to advertise events or communicate with students (Junco and Mastrodicasa, 2007). Research has begun to appear focusing on the implications of student use of Facebook, including discussions at meetings of student affairs professionals on the topic (Junco and Mastrodicasa, 2007).

MySpace is another social networking Web site, similar to Facebook, where users share profiles and information. Facebook was originally restricted to users with a valid e-mail address on a college campus, but MySpace was geared toward a more general audience, specifically including the marketing of bands, comedians, and other performers. MySpace allows users to post blogs directly on the site (Junco and Mastrodicasa, 2007).

The role of social networking Web sites in a crisis situation is still evolving, but some campuses have been able to use them in attempts to notify campus communities in the case of a campus crisis. One example is a Facebook group begun by campus administrators for emergency notification at the University of Minnesota, which had more than three thousand

members as of October 2007. Campus administrators send messages to the Facebook group in an emergency (Weinmann and Horwath, 2007).

When there was a gunman on the campus of the University of Wisconsin-Madison in September 2007, the text messaging system was not ready for use. Beyond the traditional methods of mass e-mails and notice on the Web site, the university also posted fliers on the Facebook Web site to notify students about the emergency situation. There were fifty thousand campus network members with accounts on Facebook, and the university reported forty thousand views of the flier and four thousand clicks on the flier to go to the Web site for more information (Rivera, 2007). One can argue that this method was not useful or efficient, but in the case of a campus crisis, all means of communication are used if possible.

In addition to using social networking Web sites to notify campus communities, other users turn to these sites to cope and respond during the crisis. Students also choose to use Facebook or MySpace as a means to communicate with each other or to the greater community in the case of campus crises. For example, after the Virginia Tech shootings, postings such as "Are you OK?" helped students locate their friends, find out what was happening, or tell their stories of the event (PaperClip Communications, 2007; Read, 2007b). More than three thousand students joined a Facebook group called "I'm OK at VT," which allowed them to say that they were safe, inquire about missing others, and eventually list the names of the victims (Read, 2007b). More than ten thousand students at Virginia Tech used social network sites such as Facebook or MySpace to communicate on the day of the shootings (PaperClip Communications, 2007). Gifts or individual tributes on each victim's profile page were left in mourning (Heffernan, 2007).

More than five hundred Facebook groups were created after the Virginia Tech tragedy, including tributes from various others, issue-oriented groups about gun control and mental health, ways to assist or support the victims, general information about the shooting incident, and some that specifically focused on the perpetrator (Facebook, 2008; PaperClip Communications, 2007; PBS, 2007). One image of Virginia Tech's logo in front of a black ribbon became popular with Facebook users, and many students changed their profile photos to that logo or posted it elsewhere on their profiles to show support (Read, 2007a). Similarly, events on many other campuses were announced online supporting the Virginia Tech victims (Facebook, 2008; PaperClip Communications, 2007). Within a day of the shootings, more than fifty-four hundred students and alumni joined the Facebook group VT Unite, which offered students a place to grieve and show solidarity (Read, 2007a). Heffernan (2007) reported electronic bouquets, poems, and the message encouraging users of online social networking sites like Facebook and MySpace to "reach out to loners."

Prior to the Virginia Tech shootings, Facebook's policy was to freeze the profiles for thirty days of users who had died. Once a confirmed friend or

family member contacted Facebook about a user who had passed away, Facebook would implement the memorialization of this person's profile and hide contact and personal information and the listing of his or her groups. However, visitors would still see photo albums, basic and educational information, and the deceased person's message board wall. However, the policy was reconsidered after online protests and a letter-writing campaign to Facebook after the Virginia Tech shootings, and those pages will remain indefinitely on the social networking site. Friends and family reported finding comfort in the profile pages of those who died (Hortobagyi, 2007).

Blogging. Web-based journals known as blogs host the writings of individuals or organizations posted in a sequential series of dated entries in a public or semipublic forum on the Internet. Blogging has been widely used by traditional-aged college students and is increasingly popular with all ages (Junco and Mastrodicasa, 2007). Assuming that access to the Internet is available, blogging is one mechanism to share updates as new information becomes available. The ability to share information quickly and without requiring much technical expertise from users makes the use of a blog a good tool in a crisis situation.

Blogs were readily used during Hurricane Katrina to share information, especially to the more than six thousand employees and thirteen thousand students of Tulane University who were then living in various places all over the world. Tulane staff began to monitor blogs, reading and correcting inaccurate information on them, and a "blog analyst" read the blogs every evening and provided daily synopses to staff to provide updated information (Cherrey, 2006).

Blogs provide a forum for colleagues to lend support to those managing the crisis. For example, student affairs professionals posted on blog sites through the Web site of the National Association of Student Personnel Administrators to lend their support to colleagues in the Gulf Coast area after Hurricane Katrina and after the Virginia Tech tragedy. The National Association of Student Personnel Administrators has also used its blogs to provide discussion and support for active-duty soldiers, reservists, and veterans, as well as to discuss strategies for security after Virginia Tech.

Lessons Learned

Despite planning and training exercises, every crisis teaches administrators ways to improve future responses.

Hurricane Katrina. Hurricane Katrina struck the central U.S. Gulf Coast on August 29, 2005, causing massive destruction along the coast from Alabama to Louisiana. The impact of the storm on New Orleans was unprecedented, and the images of massive flooding of a significant part of the city, residents packed into the Superdome, and the resulting destruction of the community infrastructure were constantly broadcasted.

Several institutions of higher education in the Gulf Coast area were greatly affected, and the student affairs staff and other administrators worked toward an integrated campus response. Before the hurricane came ashore, student affairs staff at Louisiana State University (LSU) in Baton Rouge, which was less directly affected by the hurricane, worked to provide emergency information to the campus community, as well as prepare for evacuated students and families from the New Orleans area. After Katrina, they located and provided short-term housing for rescue and recovery workers as they arrived on the LSU campus (Babcock, 2005).

College students who were enrolled in other universities in New Orleans (such as Tulane, Loyola University, Xavier University, Dillard University, Southern University, and the University of New Orleans) fled to other institutions, attending as transient or nondegree-seeking students (Rollo and Zdziarski, 2007). After the storm, LSU enrolled, registered, and housed visiting students, as well as cared for the mental health of the visiting and current students and its own frontline staff members who had worked for weeks without much break (Babcock, 2005). Various institutions collaborated to provide what assistance they could, offering courses for displaced students (Rollo and Zdziarski, 2007).

Because the hurricane struck at the beginning of the semester for most of the institutions, the timing was critical in attempts at communication. The magnitude of this crisis made the need for constant communication even more crucial, but the reality of the situation meant that such communication was difficult. Power lines and cell phone towers were dismantled by the hurricane, and communication by cell phone to the Gulf Coast area was initially impossible. Landlines accessible through family or friends or hotels in affected areas served as primary means for communication.

The student-run radio station at LSU in Baton Rouge, KLSU, did not lose power during the storm and was able to update the campus community with emergency information beginning the day before Hurricane Katrina struck. It continued to broadcast hurricane-related information for a week after the storm (Babcock, 2005).

At Tulane University, the initial source of information for faculty, staff, and students was the Web. The campus e-mail servers did not work, forcing staff to turn to third-party e-mail accounts through AOL, Yahoo, and Gmail for e-mail service. Eventually staff at Tulane obtained cell phones from outside the local area codes to get them to work as some cell towers were reconstructed, and some used text messaging for the first time as the most reliable way to communicate (Cherrey, 2006; Whitely, Felice, and Bailey, 2007). A newer source of information for Tulane staff became blogs; they began to monitor blogs and provided daily summaries of information from others' blogs to share information within the staff (Cherrey, 2006).

The Ask TU site was created for e-mail questions from parents, students, faculty, and staff. The university's emergency Web site became the official source of information about Tulane. A campus vendor, the Coca-

Cola Company, supplied phones and a toll-free number at its Houston office to create a call center location for the relocated university administration, which had been moved to Houston. At Tulane, an assistant vice president for student affairs persuaded Coca-Cola to provide assistance, and another assistant vice president for student affairs recruited and trained staff members to respond to the most frequently asked questions at the call center. Between September and December 2005, the call center handled more than 12,600 phone calls (Cherrey, 2006).

Cherrey (2006) stated that one lesson from the Tulane experience was the need to still have personal contacts to answer questions and to acknowledge concerns rather than just relying on a Web site to provide one-way communication. First-year students were moving in the same day that Tulane University evacuated students, and student affairs staff members were each assigned fifty new first-year students to call every other week to address concerns and answer questions (Cherrey, 2006).

In a new sense of collaboration, the American Council on Education and the National Association of College and University Business Officers created a Web site, CampusRelief.org, to serve as a clearinghouse of information for students, faculty, staff, and institutions to assist in the recovery and relocation process. This site was expanded to include other hurricanes that struck the United States the same fall, specifically Wilma and Rita, and it became the first example of a means for direct campus-to-campus disaster assistance.

Lessons Learned: Virginia Tech. In April 2007, the largest massacre on a college campus in the United States took place when a student killed thirty-two people in two buildings of Virginia Polytechnic Institute and then took his own life (Sink, 2007). The existing emergency notification system at Virginia Tech sent information through the home page of the university's Web site, mass e-mails to university accounts, phone messages to campus phones, as well as media support outlets such as local radio and television (Rivera, 2007).

The constant media coverage and investigation of the Virginia Tech incident revealed more information about the shooter and whether the shooting could have been prevented or stopped. In addition to secondary coverage, one source of information about the incident came from cell phones, which recorded video that captured gunshots from Norris Hall where the gunman and thirty others died (PBS, 2007).

One of the immediate results of the Virginia Tech shootings was an intense scrutiny of the crisis management plans (including security and communication) at other institutions of higher education (Sink, 2007). In addition to campus leaders asking questions and testing plans, students, faculty, staff, parents, and elected officials were asking about those issues as well. Official reports were commissioned by the federal government as well as by the state of Virginia, examining information about the apparently disturbed student, the relationship of the university to the student, and the communication between the university and the campus community (Sink, 2007).

During summer 2007, colleges and universities around the country revised campus policies for dealing with violence, started additional mental health training for faculty and staff to identify and support those who might need mental health support, and added campus security precautions such as additional deadbolts to residence hall rooms. One campus created a new administrative position to oversee emergency operations on campus (Sink, 2007). Many universities wrote specific messages to the university community discussing their security and crisis management plans and asking for those on campus to share their emergency contact information with the university. Along with these measures, many campuses have decided to institute emergency text messaging systems as well.

Clemson University, for example, initiated discussion with its student body about safety on campus. In a letter posted online to Clemson students, the vice president for student affairs stated that the university had allotted over $2 million to improve campus security, hired more police officers, joined in the new local new 911 system, installed two new warning sirens with voice capability, and brought in a new text messaging and e-mail system. The letter then asked for all Clemson students to update their contact information with the university (DiSabatino, 2007).

Campuses and entire statewide systems across the country examined the implementation of emergency notification systems on campus. Many opted to install and activate new alert systems (Lipka, 2007; Sink, 2007). Incidents on the campuses of Delaware State University and the University of Memphis tested emergency plans made in response to the Virginia Tech crisis (Sink, 2007).

At Virginia Tech, the administration implemented the VT Alerts system, which sends voice messages, text messages to non-VT phones, e-mails to non-VT accounts, and instant messages through AOL, Yahoo! and MSN. Students, faculty, and staff can sign up to be alerted by the system, and a siren system has been added for outside notification. Approximately 60 percent of the campus community had signed up for the voluntary system (Rivera, 2007). It should be noted that the campus expanded beyond its immediate reach of campus e-mail accounts to reach students where they spend more time: on noncampus accounts through private providers.

Conclusion

The use of technology in the time of a crisis on a college campus is becoming more of a necessity in order to communicate accurate information as rapidly as possible. Media coverage of crisis situations forces institutions of higher education at the very least to give the appearance of being in control because images almost certainly will be broadcast quickly to the general public as well as the campus community. In addition, the expectations of college students and their parents now is that students will be safe at college; any

demonstration to the contrary hurts the college's reputation. It is crucial that colleges and universities invest in their technology and develop and rehearse a campus crisis plan to ensure that they are ready for the unexpected.

There are several recommendations for colleges and universities to utilize technology to communicate with their campus community.

- Colleges and universities should remain current with technology trends and use within its campus community. Traditionally, students are ahead of their institutions of higher education in their technology use and implementation. For example, although universities use e-mail to communicate with students and students prefer e-mail for that purpose, students are also choosing to use other means to communicate with each other, such as social networking Web sites and text messaging (Carnevale, 2006; Junco and Mastrodicasa, 2007; Salazar, Caruso, and Nelson, 2007).
- Colleges should not attempt to jump ahead each time there is a new development in technology. The expense and logistics of frequent shifting of communication processes greatly outweigh the benefits of being on the cutting edge of technology. Having a solid system that works effectively is more important than having the latest gadget.
- The private sector is a competitive arena that is constantly providing better technology. This is why students are choosing e-mail service for their personal e-mail through Google (Gmail) or Yahoo! as well as through other companies. Colleges and universities should pursue the possibilities of outsourcing their e-mail systems or other technology systems rather than developing and maintaining their own internal systems in order to maintain that e-mail communication process.
- Campuses that use emergency notification systems should keep the number of individuals who might have access to the system, as well as the number of messages, to a minimum. If too many messages are sent, the recipients will not be as attentive to the messages and may not respond accordingly in the case of a true emergency.
- The opportunity to build partnerships with private technology companies should be fully explored. Technology is an expensive enterprise; the ability to serve a campus community without paying for the infrastructure could provide campuses with the means to communicate more quickly and cheaply. The cost of such partnerships should be approached with caution and the impact evaluated in the light of the campus culture.

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