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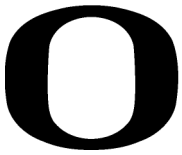

UNIVERSITY OF OREGON
APPLIED INFORMATION MANAGEMENT

Applied Information Management
and the Graduate School of the
University of Oregon
in partial fulfillment of the
requirement for the degree of
Master of Science

Emergency Notification Systems within a Community College Environment

CAPSTONE REPORT

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July 2010

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Abstract

Emergency Notification Systems (ENS) are in wide use in higher education, including community colleges. Literature published between 1990 and 2010 is examined in regards to the use of ENS in the community college setting in light of the distinct community college broad-based mission and recent reductions in funding sources. The analysis produces eleven recommendations to guide planning and implementation of ENS in an open community college environment, for use by community college technology and safety administrators.

Keywords: emergency notification system, emergency alert system, mass notification system, community college

Table of Contents

List of Tables

Introduction

Purpose

The purpose of this study is to identify factors for consideration related to the planning and implementation of emergency notification systems in a community college environment, within the context of a broad academic mission and limited public funding. An Emergency Notification System (ENS), also known as an Emergency Alert Systems (EAS) (Traynor, 2008) or Mass Notification System (MNS) (Schneider, 2010), refers to a variety of different solutions and tools that are designed to limit the impact of an emergency by providing near-to-real-time information (Staman, Katsouros, & Hach, 2009).

Many universities and colleges rely on technology based ENS solutions to notify a campus of an emergency (Chretien, 2008; Selingo, February 2008; Young, February 2008). This study approaches the topic from two perspectives: (a) by examining factors in planning and implementing an emergency notification system at four-year colleges or universities, and (b) by examining the unique factors faced by community colleges (Watson, Melancon, & Kinchen, 2008), and how they might affect planning and handling of emergency situations.

Audience/Outcome

The targeted audience for this study includes senior community college campus leaders in the areas of Information Technology (IT), and campus safety or security because of the well documented critical role that these two groups play in the deployment and utilization of ENS on college campuses (Chretien, 2008; Halligan, 2009; Molinski, 2008; Page, 2008). Profiles of these two target groups are provided:

Heads of Information Technology strategic and operational management: This group includes leadership in charge of and responsible for the management of communications technologies that are most common to delivering emergency information (Page, 2008),

Heads of campus safety/security: This group includes leadership who are in charge of campus security and policing, whose staff are the campus emergency response organization (Molinski, 2008), but they are also crucial for emergency planning and coordinating with off-campus law enforcement (Molinski, 2008).

Rather than develop a study to support selection of a specific notification technology, the objective of this study is to produce a guide for community college administrators to use in support of planning and implementing a notification system (Page, 2008). The guide is organized in two segments, each framed by one of the larger themes guiding the data analysis. Themes are further revised into a set of recommendations to achieve this goal. The first segment is developed to assist in the planning and implementation of an ENS for a college environment. The second segment is focused on the unique factors that need examination specifically at a two-year college.

Research Questions

Main Question: What unique factors surrounding funding and a broad mission need to be considered when planning and implementing an ENS at a community college?

Sub-Questions:

- What constitutes an ENS?
- What technologies are regularly examined when planning an ENS?
- What factors are taken into account when planning an ENS?

- What can be learned from previous ENS implementations that occurred at other colleges?
- What factors are unique in regards to a community college?
- What challenges in regards to ENS are faced by community college with reduced funding?
- What defines the mission of a community college?
- What defines open access at a community college?

Based on a review of past implementations of ENS within two and four year colleges across the United States, Staman et al. (2008) and Violino (2008) note limitations to some of the technologies, such as adoption rates, delays in users receiving emergency notices and the ability to contact information up to date. Additionally, it is widely noted that multimodal communication via ENS ultimately leads to more successful timely delivery of communications (Latimer, 2008; Staman et al., 2009; Violino, 2008). Therefore the assumption underlying this study is that, while there are common factors shared by these differing institutions, the mission and funding methodologies behind most of the nation's community colleges produce some unique factors that must be considered when planning for and implementing an ENS compared to implementation at four-year university or college.

Problem/Significance

Maintaining safety on college campuses has been a high priority goal ever since the 2001, September 11th attacks on New York and Washington, DC (Mitroff, Diamond, & Alpaslan, 2006) and the slayings at Virginia Tech in 2007 (Fischer & Wilson, 2007). Page (2008) notes in a study for Educause that:

> …the threat posed by an active shooter on a college or university campus has refocused the attention of higher education institutions on crisis management, institutional leaders are increasingly aware of the need to develop comprehensive emergency preparedness plans that anticipate and address all hazards—from man-made events to natural disasters. (p. 5)

Although a significant amount of attention is spent examining how to best maintain safety within "large, R-1 universities" (Staman et al., p. 63), the need to maintain safety is also encountered by the nation's community colleges (Halligan, 2009; Violino, 2008). There are many factors to consider within the context of a community college that have potential to impact information management strategic planning and process management in a direct manner. For example, allocations need to be made to integrate ENS into both strategic information technology planning and operations and wider college strategic and operational planning (Mitroff et al., 2006). Additionally the unique factors faced by a community college in terms of both its mission (Shaffer, 2009) and funding (Mullin & Honeyman, 2008) increase the need to view an ENS from strategic level. Consequently the deployment of Emergency Notification Systems (ENS) rises "to a higher level of urgency than at any other time in the history of academe" (Staman et al., 2009, p. 49).

The need for a form of ENS on America's college campuses is well established in the years since the murders at Virginia Tech in 2007 (Page, 2008; Selingo, February 2008; Staman et al., 2008). Community colleges do not feel exempt from a need to provide an ENS to their students (Gnage, Dziagwa, & White, 2009; Halligan, 2009; Violino, 2008) despite a perception that, as Reitano (1990) notes, they are "outside the mainstream of higher education" (p. 120).

The outsider perception holds true despite the multifaceted higher educational mission of community colleges (Reitano, 1990; Watson et al., 2008).

While the need for ENS at a community college is more urgent than before (Community College Journal, 2008), funding of all public institutions in general is reduced (Baum & Ma, 2009) and the funding of community colleges often lags behind public four-year universities and colleges (Mullin & Honeyman, 2008; Watson et al., 2008). Shaffer (2009) states funding for community colleges makes up about one-sixth of what is allocated for all of higher education despite enrolling nearly half of all college students. Such a combination of factors can make selecting an ENS more difficult given the complex nature of a higher education environment, including organizational structure, campus environment, and changing population of constituents (Page, 2008). Thus, this study seeks to align implemented practices at large schools (Staman et al., 2008) with the unique factors of community colleges in order to refine a set of guidelines for use by community colleges in planning and implementing an ENS.

Delimitations

This study is delimited in the following manner:

Topic focus. While this study makes use of prior implementation experiences documented at four-year colleges, the study is focused on identification of factors unique to community colleges and other two-year collegiate institutions such as technical and junior colleges.

Exclusions. The study does not seek to recommend the implementation of specific technologies though such technologies are part of any potential ENS. The study does not seek to develop a general disaster management or recovery plan though an ENS maybe one part of such a plan. This study does not seek to note differences between ENS requirements at specific

community colleges. The study does not focus in depth on differences in community college funding (Mullin & Honeyman, 2008), but rather on the generally lower state funding paid to community colleges and the underlying causes (Mullin & Honeyman, 2008; Watson et al., 2008).

Time frame. Although tragic events are not uncommon at educational institutions for much of the past twenty years (Smith & Millar, 2005), it is the 2001, September 11th attacks on New York and Washington, DC (Mitroff et al., 2006) and the 2007 incident at Virginia Tech that drives concern for improved communication during a crisis (Fischer & Wilson, 2007). Therefore, with select exceptions, the references that are examined in this study largely originate in the past five years.

Selection criteria. The literature for this study is retrieved from University of Oregon Library Catalog, ERIC, Education Abstracts, JSTOR, Project MUSE, and Academic Search Premier. Additional materials are pulled from Educause.com, the US Department of Education, The Chronicle of Higher Education, and Google Scholar. Literature sources are defined as peer reviewed journal articles and studies, trade periodicals and media, government publications, and non-trade periodicals and media.

Sources are evaluated for their status as peer reviewed (Bell & Smith 2009) and directly connected to or reporting on education. Trade journals, websites, and periodicals are assessed based on their sponsor and general relevancy.

Audience. This researcher currently plans and oversees information technology operations for critical server and network infrastructure support in a community college. The position has responsibilities to contribute to the planning and implementation of college-wide systems, which include planning for and implementing an emergency notification system. The

targeted audience for this study includes professionals in similar roles, with specific focus on senior community college campus leaders in the areas of Information Technology (IT), and campus safety or security because of the well documented critical role that these two groups play in the deployment and utilization of ENS on college campuses (Chretien, 2008; Halligan, 2009; Molinski, 2008; Page, 2008; Selingo, 2008; Young, 2008).

Data Analysis Preview

The data analysis process selected for this study is content analysis (Busch, De Maret, Flynn, Kellum, Le, & Meyers, 2005). The process begins with an initial sort of the literature for this study, first by general subject and then by like source types. The four main subjects in this study are emergency notification systems and technologies, lessons from disaster and recovery, community college funding, and community college mission. Subject areas are then linked into the broader themes that are in line with the objectives of the study: (a) ENS practices concerning planning and implementation, and (b) factors unique to a community college environment concerning funding and mission.

The collected literature is initially analyzed using the three-step process of collecting, scanning, and reading in depth, as guided by the process defined in Obenzinger (2005). This methodology is primarily utilized during data collection and scanning in order to select specific literature for review, guided by quality standards established by Bell and Smith (2009). The data collecting and scanning process allows for a "sense of priorities" (Obenzinger, 2005, p.6) to be established before actual collection of any data.

Busch et al. (2005) define a coding process, which guides in depth reading. During in depth reading the source data is noted and highlighted wherever possible and short general article summaries, noting key themes, are recorded for each reference. Key themes are coded in two

stages, following the guidelines provided by Busch et al. (2005): during stage one, reported practices in both emergency notification planning and emergency notification system use within the university campus environment are identified; during stage two, factors specific to community colleges, both before and after an emergency situation occurs, are identified. Analysis is focused on the unique factors that arise in an emergency situation at a community college due to the broad nature of the academic mission of a community college (Shaffer, 2009) and an historical pattern of lower public funding (Mullin & Honeyman, 2008; Watson et al., 2008).

Writing Plan Preview

The presentation of the results of the data analysis process is organized around the principle of a thematic review that provides a study centered on a central theme (Literature review, n.d.). In this study the detailed elements of two central themes examined during the data analysis process are addressed and presented as: (a) factors involved in planning for and deploying emergency notification systems, and (b) and unique factors for consideration that distinguish community colleges from their four-year peer institutions. Once identified, the detailed factors of each of the two central themes are re-examined in light of the purpose of the study, the research questions, and the needs of the audience. The objective is to produce a guide for community college administrators based on a thorough understanding and analysis of these two themes and the respective underlying factors. The guide is organized in two segments, containing a total of eleven key factors, as described in the Outcomes section above.

Definitions

This literature review examines literature relating to the planning and implementation of emergency notification systems and the unique challenges facing community colleges. The terms and phrases in the selected literature form a vocabulary that has meaning within a higher education, information technology, or campus safety setting. Selected definitions are provided below as a means to highlight the meaning behind these specialized words.

Adoption Rate – The rate at which subscribers elect to participate in an ENS (Staman et al, 2009). Also known as **subscription rate** (Staman et al., 2009), **participation rate** (Latimer, 2008), or **enrollment rate** (Latimer, 2008).

Community College – Two-year colleges are founded to meet the needs of students not attending four-year colleges (Reitano, 1990). They now serve a multifaceted purpose including community education, worker training, and a less expensive start to a transfer into four-year schools (Shaffer, 2009). Also often known as a **two-year college, technical college, or junior college** (Reitano, 1990; Watson et al., 2008).

Digital Signage (Electronic Message Board) – A digital display, including televisions or other electronic devices, which are used to provide visual information to a selected area (Staman et al., 2009)

Emergency Communications Management (ECM) – "refers to the policies, procedures, and operations acting in concert with an ENS" (Staman et al., 2009, p. 50).

Emergency Notification System (ENS) – The methods and technologies that are used to deliver emergency messages to various populations of a college environment (Page, 2008). Also known

as an **Emergency Alert System (EAS)** (Fischer & Wilson, 2007), or a **Mass Notification System (MNS)** (Latimer, 2008).

Four-Year College/University – Name that is generally used for institutions of higher education in the United States designed to graduate students with degrees in four years (Shaffer, 2009).

Full Time Equivalency (FTE) – A calculated number of the total population of a school's enrollment frequently used as foundation for a funding formula (Askin, 2007).

Funding Formula – The method by which many state governments determine funding for community colleges (Mullin & Honeyman, 2008).

Multi-modal – A design philosophy regarding ENS that encourages institutions to utilize multiple parallel means to communicate emergency messages to their various constituents (Latimer, 2008).

Open Access – An educational model typically used in American community colleges that allows any potential student to take classes with few restrictions (Vaughan, 2005). This is opposed to a traditional admissions model that restricts or caps the number and type of students who may take classes at the college or university.

Short Message System (SMS) – A delivery method via cellular telephone networks for short text based messages limited in length to 160 characters (Latimer, 2008).

Social Networking – These are sites, such as MySpace and Facebook, which allow users to create and share their own content with friends online (Page, 2008).

Research Parameters

This section of the document outlines the research design of the study. Included are a presentation of the search strategy, key terms, and a documented record of searches conducted. Additionally this section outlines the database selection and the approach to documentation of information. Finally a full description of the steps undertaken to analyze and present the data is presented.

Search Process

The methodology for locating research materials for this study proceeds along two paths. The first is to locate material related to reported best practices in both emergency notification planning and emergency notification system use within the university campus environment (Page, 2008; Young, 2008). The term best practice refers to a body of practices, policies and procedures that are recognized by peers as an appropriate methodology in the realm applied (Oxford English Dictionary, n.d.). The second is to locate material that describes factors specific to community colleges, both before and after an emergency situation occurs (Mullin & Honeyman, 2008; Watson et al., 2008). The intent is to collect literature that examines the unique challenges that arise in an emergency situation at a community college due to the broad nature of the academic mission of a community college (Shaffer, 2009) and a historical pattern of lower public funding (Mullin & Honeyman, 2008; Watson et al., 2008).

Search terms. The key words used to search for literature originate from broad categories related to the area of the study and are often joined in an effort to narrow the returns. These keywords are derived from standard Information Technology and industry terminology commonly used in trade press and journal articles (Staman et al., 2009; Watson et al., 2008)

garnered from initial generalized topic searches using University of Oregon's Education OneSearch dataset. The following key words are used:

Key Search Terms

- emergency notification
- emergency notification system
- community college
- mass notification

Sub-Topic Search Terms

Alternate Terminology for Colleges

- two year
- four year
- two year college
- four year college

Alternate Terminology for Emergency

- disaster

Challenges Specific to Community Colleges

- community college unique
- community college funding
- community college mission
- financing higher education

Record of preliminary searches. Initial general searches provide a significant amount of literature pertaining to ENS at four-year colleges from the past five years. Further refinement of searches indicates that references are published in clusters after emergency events affecting both

two and four-year colleges, such as Hurricane Katrina and the Virginia Tech shootings. References relating to community college funding and mission occur for much of the last twenty years with a recent focus driven by government worker retraining funding. A full search report including reasoning behind search decisions is detailed in Appendix A.

Literature Resources

Using the keywords above, information for this study is gathered using the information sources below.

Search engines and databases. Searches are conducted against the Education journal database OneSearch dataset at the University of Oregon Library. This dataset is consistent in producing high quality, relevant articles and studies as it produces a number of valid peer-reviewed sources. The databases that are searched by this dataset are the Education Resources Information Center (ERIC), Education Abstracts, and Academic Search Premier. Searches for government information are conducted against the Government Information OneSearch dataset that searches Academic Search Premier, JSTOR, Project MUSE, and the University of Oregon catalog. This dataset produces broad general results from which some source material is located.

Sample searches are conducted using Google Scholar, however with the exception of one thesis, the results are generally poor with few that have peer-reviewed content. Additional experimental searches are conducted using CiteSeer however there are no or few relevant results and are dismissed.

Additional useful references originate from the EDUCAUSE web site, published EDUCAUSE studies, the US Department of Education, and The Chronicle of Higher Education due to their immediately applicable background information relating to the topic. These types of

governmental sources and educational trade journals are used as a source for further exploration of the study.

Documentation approach. Original source documents and web pages are sought in PDF or HTML format wherever possible. References are reviewed based on abstract, if available, or by a quick scan of the reference material. If the material relates to the two generalized search themes of emergency notification or community college challenges then it is saved for further review. Research notes, an impression at the time, and screenshots regarding information from web based references are recorded for later reference using Zotero and then are transferred to a Word document table for refinement and inclusion into the study.

Selection and Evaluation Criteria

Selection criteria. References for this study are initially selected via keyword search. The keywords used are noted above but center around two central themes: (a) emergency notification in a university environment and (b) challenges related to community colleges both in terms of funding availability and diverse missions. In order to maintain the immediate relevancy of the information, sources are limited by date to material published since 2001. However, exceptions are made regarding sources relating to community college funding and mission challenges, due to the long history of community colleges (Reitano, 1990) and the continued citation of certain works in recent peer-reviewed articles that date prior to 2001.

Once a determination is made regarding the date limitation, the abstract or introduction is reviewed for relevancy to the study based on reference theme and keywords present. If necessary the reference is quickly scanned to confirm or deny relvancy to the study. Finally the reference's bibliography, if present, is reviewed for applicability and if relevancy is found then a search for those references begins.

Evaluation criteria. Credibility for references is established by giving preference to peer-reviewed works and utilizing the guidelines laid down by Bell and Smith (2009). The author's credentials are examined using available biographic data such as degrees, past writings, and affiliations from publishers website and via web search. Additionally, source publisher reputation is examined via web searches to assess for quality, writing goals, vendor autonomy, and publishing institution reputation.

Data Analysis

The data analysis is conducted using a process known as conceptual analysis. Busch et al. (2005) describe the process in a series of eight steps that define an approach to coding the selected literature. For this study the process of coding involves the following specific application of these eight steps:

1. **Decide the level of analysis.** For this study the level of analysis is to code for words and phrases.

2. **Concepts for coding.** The references selected for coding in this study are coded based on two larger complex concepts: (a) ENS practices concerning planning and implementation, and (b) factors unique to a community college environment concerning funding and mission. Sub-concepts are used to help refine the coding into specific topics to be addressed in the literature review. ENS practices include the sub-concepts of adoption rate, ENS technology, and multimodal communication. Factors unique to community colleges include the sub-concepts of community college funding, access, and mission.

3. **Existence or frequency coding.** This study is coded based on the existence of words or phrases of a concept within a reference. However, Busch et al. (2005) note that number of occurrences in a reference can allow for a more detailed insight regarding the importance and

relevance of each concept within a given specific reference.

4. **Levels of generalization.** This study works with complex concepts and is coded so that similar concepts are treated as one. For example, the concepts of "emergency notification system" and "mass notification system", or "funding" and "state funding model", are treated as the same.

5. **Translation rules.** Rules are established prior to the start of the coding process to clarify how like concepts will be grouped. For example, notification technologies such as SMS, digital signage, email, sirens, and loudspeakers are all grouped under the ENS sub-concept of emergency notification system technology. However, the rules also help prevent erroneous coding of an unrelated reference, such as the phrases *emergency notification* and *planning* occurs in a reference that focuses on disaster recovery planning.

6. **Irrelevant information.** Concepts or language that are not directly related to the subject of the study are discarded. If an emergent item is deemed relevant to the subject then the coding is expanded to accommodate the new concept and the coding process resumes.

7. **Coding.** Selected references available in electronic form are coded using the search feature in the Apple Preview and Adobe Acrobat Reader applications. The search results are read, reviewed for relevancy, and the relevant occurrences are added manually to the spreadsheet. References not available electronically or for which there is a failure of the search feature are coded manually. Any relevant terms and concepts are marked and the total for each sub-concept within a reference is compiled. The results are assembled into an Excel spreadsheet, which tracks the existence of a term, phrase, or concept as it appears in a reference.

8. **Analysis.** Once all the data is assembled in a spreadsheet, then the data categorized in each of the two main concepts is examined for context. Busch et al. (2005) note the goal is to

look for trends and insights in the data. See the Writing Plan below for details.

Writing Plan

The results of the data analysis process are presented in the form of a thematic review organized around a central theme or set of themes (Literature review, n.d.). There are two central themes in this study: (a) practices involved in planning for and deploying emergency notification systems, and (b) unique factors for consideration that distinguish community colleges from their four-year peer institutions. Each theme is discussed separately in a guide designed to be useful to senior campus technology and security administrators as they proceed to develop and plan for ENS at their schools. A brief summary of the anticipated themes is discussed below.

Theme I. Recommendation of practices in planning and implementation of an emergency notification system at both two and four-year colleges and universities. This section presents a discussion for planning practices in relation to the deployment of an ENS at a college or university. Concepts around planning include the selection of appropriate technologies, hazard assessment, and the challenges inherent in the higher education academic culture. The goal is to establish a foundation of what is considered effective planning for an ENS. This theme also explores implementation practices in relation to the deployment of an ENS. Concepts around implementation include staffing and techniques and facts learned from previous ENS implementation experience, including technology challenges, adoption rates, multimodal communications, and funding. This section includes a report of the challenges encountered during previous ENS installation and usage situations.

Theme II. Unique factors that separate community colleges from peer four-year institutions that might influence ENS recommendation selections and prioritization. This theme discusses what factors are unique to community colleges regarding the planning and

implementation for an ENS when compared with four-year colleges and universities. One predetermined concept is funding, which includes factors of reduced state funding, funding formulas, and nation wide funding trends, including those that impact the funding available to community colleges for overall college operations. This theme also examines the concept of the broad nature of the institutional mission of the community college, and related factors unique to planning and implementation for an ENS in community colleges (Reitano, 1990; Watson et al., 2008). Factors include increasing student enrollment and the open-access model. This theme begins with a brief examination of the history of community college mission and the evolution to the current status of diversified missions.

Annotated Bibliography

This section of the study provides a list of key references selected to build this study. Many are part of the coding set, utilized during data analysis. Each of the more than twenty references is selected for inclusion due to the information it provides in relation to ENS or community colleges. Each annotation contains the complete bibliographic citation, a published abstract and comments describing the relevancy of the material to the development of this study.

Askin, J A., (2007). Community college mission: re(S)ources make a difference, *Community College Journal of Research and Practice , 31*, 977-997.

Abstract. Community colleges are unique among higher education institutions in their potential access to local appropriations as well as state funding. A total of 26 states reported to the Education Commission of the States in 2001 that community colleges in their states received some share of local funding. Using data for 781 public community colleges, we explored the implications of resource dependency theory for mission differentiation between dual-funded and state-funded colleges. Significant differences were observed in their student bodies, programming, expenditures, and outcomes. These differences have implications for the increasing dependence on state funding for community colleges and the roles these institutions play. (Contains 2 tables.)

Comments. This reference provides information used to develop this study's discussion of community college funding, presented in the literature review section of the document. In addition, it is part of the coding set for data analysis. The reference describes the challenges of providing local education without allowing restricting and serving multiple populations, while local support declines. The reference is deemed credible because it is

published in a peer review journal and the author is a community college vice president at Paradise Valley Community College, who has published several other scholarly works.

Bambenek, J., & Klus, A. (2008). Do emergency text messaging systems put more students in danger? *EDUCAUSE Quarterly , 31* (3), 12-16. Retrieved April 6, 2010, from http://www.educause.edu/EDUCAUSE+Quarterly/EDUCAUSEQuarterlyMagazineVolum/DoEmergencyTextMessagingSystem/163097

Abstract. Cell phones have become prevalent on college campuses. Most students use them as their primary phone to avoid changing phone service every year or dealing with university–based long-distance charges. In the wake of recent college shootings and threats of violence on campus, administrators have begun to deploy cell phone solutions to send emergency messages to students. Many believe that emergency text messaging systems will minimize the damage (specifically loss of life or injuries) in an emergency situation, including natural disasters. Despite the speed with which such systems are being deployed (some even mandated by law), little attention has been given to the efficacy and implications of such technologies. Crisis communication services must demonstrate several characteristics to meet the requirements for emergency operation:

* Extremely high reliability
* Excellent access control
* High-speed delivery

Does text messaging meet these requirements? No.

Comments. This reference discusses both tested and hypothetical examples of how SMS based ENS provide potential for abuse. It provides further evidence for this study for the need for alternate or multiple ENS methods. The reference is included in the data analysis

set for coding. The reference is credible as it originates from EDUCAUSE Quarterly. Additionally the authors' credentials include post-graduate academic work at The University of Illinois at Urbana-Champaign for both and SANS and Cisco Security certificates for Mr. Bambenek.

Chretien, W. (2008). *Get the Word Out*. Retrieved March 30, 2010, from Campus Technology: http://campustechnology.com/articles/2008/09/get-the-word-out.aspx?sc_lang=en.

Abstract. Emergency notification has become a critical component of every higher education institution's overall emergency plan, as incidents across the country have galvanized campus safety officials to find more ways to notify their campus populations. Emergency notification systems can help get and keep students, faculty members, and staff out of harm's way. There are abundant options in emergency notification. Unique features among offerings include: whether the system is maintained in-house or outsourced; the means used to contact campus community members; whether alerts can be targeted to specific groups; and whether the emergency notification system stands alone or is integrated with other campus systems.

Comments. The reference provides information on the various technologies available for ENS. The piece is selected for inclusion in the coding set for data analysis. The reference is deemed credible despite being from a popular magazine. The author's credentials as a PMP are disclosed, as is her employment with a consulting firm. The firm states that they do not resell any product and the magazine publisher lists that advertising does not have bearing on article selection.

Fischer, K. & Wilson, R., (2007, September 7). Va. Tech was slow to respond to gunman,

panel finds. Retrieved April 3, 2010, from *The Chronicle of Higher Education*, *54*(2), A1 http://chronicle.com/article/Va-Tech-Was-Slow-to-Respon/19684

Abstract. This article reports on the findings of the state panel on the Virginia Tech massacre. A state panel that investigated last spring's massacre at Virginia Tech has issued a harshly worded report that says the university erred in the way it handled a mentally disabled student who became a killer and in how it dealt with the immediate aftermath of the shootings. The report was one of several developments involving the shootings in the last several weeks, including the release of an internal review by the university. The panel found that the Virginia Tech police made a mistake in "prematurely concluding" that the first two murders on April 16, which occurred in a campus dormitory room, resulted from a domestic dispute and that the killer had probably left the campus. The report said the university waited much too long--about two hours--to issue a campus wide alert about those murders. While it found fault with the response to the attack, and made many recommendations for improvements, the panel did not call for the firing of any officials.

Comments. The reference is an important piece to this study as it outlines some of the immediate changes recommended after the Virginia Tech shootings. These recommendations are critical as they served as a foundation for other institutions in the years since. The article is included in the coding set for data analysis. The reference is deemed credible, as *The Chronicle of Higher Education* is a widely accepted source for higher education reporting. Additionally the authors' credentials as established higher education reporters with more than 30 years combined experience are both fully disclosed on their website.

Gnage, M., Dziagwa, C., & White, D. (2009). Safety on a rural community college campus via integrated communications. *Community College Journal of Research and Practice* , *33* (11), 948-950.

ABSTRACT: West Virginia University at Parkersburg uses a two-way emergency system as a baseline for emergency communications. The college has found that such a system, a key component of its safety and crisis management plan, can be integrated with other communication initiatives to provide focused security on the campus.

Comments. The reference provides an examination of rural community college ENS solutions. The study uses this reference to establish existing examples of community college ENS deploymentts and challenges. This article is included in the data analysis set for coding. The authors' credentials and credibility are established by their collective experience as President, Executive Director of Communications/Public Relations, and Director, Facilities and Grounds at West Virginia University at Parkersburg.

Halligan, T. (2009). Safety systems: technologies, programs help colleges react in emergencies. *Community College Journal , 79* (6), 16-18.

Abstract. Colleges across the country are rising to the task by implementing safety programs, response strategies, and technologies intended to create a secure environment for teachers and students. Whether it is preparing and responding to a natural disaster, health emergency, or act of violence, more schools are making campus safety a top priority. At Baton Rouge Community College (BRCC) in Louisiana, among others, Chancellor Myrtle Dorsey has initiated a culture of safety. Because the college has to plan for tornadoes and hurricanes, Dorsey and her crisis communications team have adopted a strategy that addresses a range of potential emergency situations. The college

also has integrated text-messaging alert notification and public address systems that can be programmed to notify faculty and students campus wide or in specific locations. Emergency procedures are posted in every room on campus, detailing measures to be taken during unforeseen events, such as bomb threats, hurricanes, and tornadoes.

Comments. The article provides foundational examples of community colleges implementing and sharing information regarding an ENS. The article is included in the coding set for data analysis. The reference is deemed credible due to the clearly defined and objective editorial policy of the publication for writers. The author served as editor of the publication, which is published by the American Association of Community Colleges.

Horn, L., & Li, X. (July, 2009). *On track to complete? A taxonomy of beginning community college students and their outcomes 3 years after enrolling: 2003–04 through 2006.* U.S. Department of Education: Institute of Education Sciences, National Center for Education Statistics. Washington, DC: National Center for Education Statistics.

Abstract. This study uses a classification scheme, the Community College Taxonomy (CCT), to analyze outcomes for beginning community college students according to how "directed" (strongly directed, moderately directed, or not directed) they are toward completing a program of study. Levels of direction are based on factors associated with student persistence and degree attainment, and outcomes examined included institutional retention, student persistence, 4-year transfer rates, enrollment continuity, and first-year attrition. The study is based on data from the 2004/06 Beginning Postsecondary Students Longitudinal Study (BPS:04/06), a national sample of undergraduates who enrolled in postsecondary institutions for the first time between July 1, 2003, and June 30, 2004;

participants were interviewed in 2004 and 2006. This study includes only students who initially enrolled in a community college and were not enrolled concurrently in any other institution. Some key findings include:

- Students classified according to the CCT as "strongly directed" toward completion had higher rates of institutional retention, student persistence, AA degree attainment, and 4-year transfer than did their less-directed peers.
- Nearly one-fourth left college in their first year and did not return within the 3-year study period. "Strongly directed" students left college in their first year at a lower rate (16 percent) than did their "moderately directed" (29 percent) or "not directed" (41 percent) counterparts.
- Overall, 49 percent of students had maintained their enrollment or completed a program of study at their first institution, and 55 percent had persisted in any postsecondary institution, within three years after their enrollment.
- Some 10 percent of students had earned an AA degree, 5 percent had obtained a vocational certificate, and nearly 20 percent had transferred to another institution.

Comments. The reference provides clear quantitative information about enrollment and student progress at community colleges and is therefore a foundational piece for this study. The reference is included in the coding set for data analysis. The reference provides well-documented text, bibliographies, and methodologies. The combined research works of the two authors total over 50 and they each hold a masters degree – one from the University of California, Los Angeles, and the other from California State University, East Bay, respectively.

Horn, L. & Li, X. (November, 2009). *Changes in postsecondary awards below the bachelor's degree: 1997-2007.* U.S. Department of Education: Institute of Education Sciences, National Center for Education Statistics. Washington, DC: National Center for Education Statistics.

Abstract. This Statistics In Brief describes changes in the number and types of postsecondary awards below the bachelor's degree (certificates and associate's degrees) conferred over the decade between 1997 and 2007. The study reports on changes overall and within fields of study; it also analyzes changes in the types of institutions that confer sub baccalaureate awards and differences in awards by gender and race/ethnicity.

Comments. The reference provides clear quantitative information about changes in degrees conferred by institutions issuing sub-bachelor degrees, including community colleges. It provides this study with a quantifiable reference about changes in the education market. The reference is included in the coding set for data analysis. The reference provides well-documented text, bibliographies, and methodologies. The combined research works of the two authors total over 50 and they each hold a masters degree – one from the University of California, Los Angeles, and the other from California State University, East Bay, respectively.

Latimer, D. (2008). Text messaging as emergency notification superstar? Nt so gr8. *Educause Review, 43*(3), 84-85.

Abstract. The reference discusses the shortcomings of Short Message System (SMS) based Emergency Notification Systems and argues that universities have a responsibility to maintain robsut communication over multiple communication modalities. The arguments are founded on a technical examination of the original intended use for SMS as a one-to-one communication tool, lack of any message reception verification mechanisms, low participation rates amongst students, limits on message length, and potential for abuse. The article suggests that multimodal communications including e-

mail, text, phone, and auditory are needed more truly ensure mass notification amongst a campus population.

Comments. The reference discusses the drawbacks of SMS based ENS systems and notes the importance of multimodal communications. The reference is included in the data analysis set for coding and the work's highlighting of weaknesses of SMS systems are important for this study. The author is Chief Information Officer for the University of Notre Dame and holds a PhD in education from The University of Tennessee.

Mitroff, I. I., Diamond, M. A., & Alpaslan, C. M. (2006). How prepared are America's colleges and universities for major crises? Assessing the state of crisis management. *Change: The Magazine of Higher Learning , 38* (1), 61-67.

Abstract. This article outlines a set of recommendations to college and university leaders and governing bodies on how to develop crisis-management systems to ensure that their institutions are as well prepared as possible for a wide range of crises. These recommendations are based, in part, on crisis-management programs developed for various business organizations by one of the authors. Since there is virtually no national research that details how colleges and universities have prepared for such events, the authors also conducted a survey of colleges and universities to determine the level of crisis-management preparation among American colleges and universities. The results of that survey also inform their recommendations. The research suggests a very mixed picture regarding crisis-management preparation in American colleges and universities.

Comments. This reference describes emergency preparedness in higher education institutions from a perspective after 9/11 but before the Virginia Tech shootings. Their academic credentials establish the authors' credibility. Mitroff is a visiting professor at

University of California, Berkeley. Diamond is vice president at University of Southern California. Alpaslan is a professor at California State University, Northridge. The magazine openly states their intended objectivity.

Molinski, S. (2008). Leveraging technology and human systems in an emergency. *EDUCAUSE Quarterly , 31* (3), 63-65.

Abstract. In this article, the author discusses the important relationship between robust technical and human systems when face with emergency. It offers several strategies as essential to reacting effectively to a crisis. When a crisis occurs, it is critical that the administration provide the appropriate information as fast as possible to the people who need to know what is happening and what they should do. That includes using various communication methods to reach as many people as possible with a message targeted to their concerns and safety needs.

Comments. This work provides background on ENS as part of a broader institutional emergency management strategy. The piece is included in the coding set for data analysis. The article is from EDUCAUSE, which is a source with a solid reputation for well-researched education related technology information. The author is deemed credible because he has professional experience as CIO at Saint Peter's College and he has worked for SunGuard, a major higher education software provider.

Mullin, C. M., & Honeyman, D. S. (2008). The funding of community colleges: Formulas & governance. *Community College Journal of Research and Practice, 32*, 512-524.

Abstract. This study identified governing state entities charged with the development of a funding formula for community colleges. Analysis of the data revealed that 40 states

utilized a funding formula. Twenty-one states had a “Higher Education” entity with governing control of the formula, 5 states had a “Community College” entity with distinct funding formulas for community colleges, funding formulas in 2 states fell under a “Comprehensive (K-20) Education” entity, and in 12 states control of a state funding formula was the responsibility of a state statute. Findings and implications of funding formula governance patterns are discussed.

Comments. This article documents an overall downward progression in local property tax support and increased reliance on state support and the use of funding formulas to determine that support. It helps define the funding situation encountered by many community colleges. The reference is peer reviewed and the author published the book, *A Struggle to Survive Funding Higher Education in the Next Century* in 1996.

Page, C. (2008, October 16). The role of IT in campus security and emergency management. Retrieved 2010, 2-April from *Educause*: http://www.educause.edu/Resources/TheRoleofITinCampusSecurityand/163282

Abstract. Vulnerabilities on the campuses of our nation's colleges and universities have come into sharp focus in recent years, dominating headlines with what seems like increasing frequency and greater consequence. In August 2008, campus leaders in safety, security, emergency management, and information technology met in Washington, D.C., to put emergency management firmly at the top of the agenda during an EDUCAUSE Summit on "The Role of IT in Campus Security and Emergency Management." Brought together by a common purpose to explore proactive approaches to emergency management and a desire to learn about emerging technologies on the horizon, the group spent two days dissecting the state of emergency management at our nation's colleges and

universities and sharing resources from their own institutions. This white paper outlines the results of the initial summit and presents key findings from two days of group brainstorming and collaboration.

Comments. This reference is a cornerstone work in this study's discussion about ENS. It outlines the summit findings of campus technology leaders and although focused on four-year institutions it provides foundational insight into several critical pieces of ENS planning and implementation. The reference is deemed credible due to the full disclosure of the author's academic credentials as a technology writer and assistant director for Teaching, Learning, and Professional Development at EDUCAUSE on the publisher's website. She holds a master's degree and writes other works for EDUCAUSE, focusing on higher education technology use including *Father Google and Mother IM: Confessions of a Net Gen Learner* and *Getting Past Google: Perspectives on Information Literacy from the Millenial Mind.* Additionally, the reference is from EDUCAUSE, a source with a solid reputation for well-researched education related technology information.

Reitano, J. R. (1990). The community college mission: access or anarchy? *Community Review , 10* (1-2), 119-126.

Abstract. This study examined the nature and degree of organizational change that occurs when community colleges offer their own baccalaureate degree programs. Utilizing qualitative research methodology, we investigated how executive administrators at two Florida colleges managed this momentous change process and how this transformation has affected their colleges' day-to-day operations. Our findings shed light on several important themes that emerged in interviews with the administrators:

justifying the need for the degree, acquiring state approval and regional accreditation, modifying existing college policies and services, meeting challenges that are inherent in this transition, and developing strategies for leading this institutional transformation. Our goal was to provide a better understanding of this multifaceted organizational change process to help community college stakeholders make educated decisions regarding the introduction of 4-year degree programs at their institutions. (Contains 2 tables.)

Comments. This reference provides a cornerstone to this study's discussion of the community college mission and is part of the coding set for data analysis. The reference describes the challenges of providing "open access" (Vaughan, 2005) education and serving multiple populations, while maintaining a traditional role of being a starting point for students seeking a transfer to a 4-year university. The reference is deemed credible because it is published in a peer review journal and the author is a community college professor at LaGuardia Community College and as the author of several scholarly works.

Selingo, J. J. (2008, 12-February). College leaders wrestle with how to prepare for unknown threats. Retrieved 2010, 2-April from *The Chronicle of Higher Education*: http://chronicle.com/article/College-Leaders-Wrestle-With/496

Abstract. This article describes how colleges are seeking the best ways to respond to dangerous incidents like the shootings that occurred at Virginia Tech, and how best to alert people on their campuses to various threats to public safety and emergencies.

Comments. The article describes the period of time shortly after the Virginia Tech shootings. This article discusses the rollout of the first mass deployment SMS based ENS and their weaknesses. The reference is deemed credible, as *The Chronicle of Higher Education* is a widely accepted source for higher education reporting. Additionally the

author's credentials as a master's educated writer and New York state public policy advisor are both fully disclosed on their website.

Shaffer, D. F. (2009). Community college mission needs clairity from the top. *Community College Week* , *22*(5), 4.

Abstract. President Obama visited Hudson Valley Community College in Troy, N.Y. on Sept. 21 to cast a spotlight on the central role that the nation's community colleges can play in upgrading the American workforce to meet the challenges of this century.

Comments. The reference, although from a magazine, provides background information surrounding the challenges of a broad mission at community colleges. The reference is included in the coding set for data analysis. Credibility is established due to the publisher's open posting of submission standards, disclosure of the writer's background, and the writer's academic background and research based employment.

Staman, M., Katsouros, M., & Hach, R. (2009). The multi-dimensional nature of emergency communications management. *EDUCAUSE Review , 44* (1), 49-63.

Abstract. Within an incredibly short period--perhaps less than twenty-four months--the need for emergency preparedness has risen to a higher level of urgency than at any other time in the history of academe. Large or small, public or private, higher education institutions are seriously considering the dual problems of notification and communications management when potentially life-threatening events confront a campus environment. Emergency preparedness is certainly not a new agenda item. Most institutions have some sort of campus hotline that students can use in the event of an assault or other violent crime and also some sort of calling tree that will communicate decisions such as a campus closing because of an impending snowstorm or similar

situation. But the problems associated with--and the opportunities for dealing with--emergency preparedness have evolved significantly in recent years, possibly catalyzed by the April 2007 shooting incident at Virginia Tech. On the one hand, there seems to be a growing tendency toward violence; on the other hand, an increasingly rich collection of notification, communications, and management tools can assist in mitigating the impact of these situations. This rich variety of tools and solutions leads to two important questions for colleges and universities to consider. First, how can these technologies be best leveraged to benefit emergency notification services? And second, what are the implications of all of these options on emergency communications management (ECM) policies and operational procedures? To help institutions answer these two questions and also to provide insight into the basic parameters of emergency communications in higher education today, the Steering Committee of the EDUCAUSE Net@EDU Converged Communications Working Group (CCWG) sent a short survey to a group of carefully selected colleges and universities. The objective was to discover the nature of the work being accomplished at these institutions. The responses to this survey also helped to inform two case studies, prepared by the CCWG Steering Committee, on emergency notification system (ENS) and ECM solutions at Virginia Tech and the University of Iowa. In this article, the authors identify several important success factors as a result of the analyses of the CCWG survey and the two case studies. (Contains 5 figures and 9 notes.)

Comments. This reference is a foundational piece regarding the challenges planning and implementing ENS systems at various higher education institutions. The reference provides key background and feedback to institutions regarding ENS deployment

challenges. The reference is included in the coding set for data analysis. The reference is deemed credible due to the full disclosure of the authors combined over 60 years experience as technology leaders at Macon State, University of Iowa, and Virginia Tech and other scholarly writing on technology and communication. Additionally, the reference is from EDUCAUSE, a source with a solid reputation for well-researched education related technology information.

Tollefson, T. A. (2009). Community college governance, funding, and accountability: a century of issues and trends. *Community College Journal of Research and Practice*, *33*(3), 386-402.

Abstract. Community colleges in America are now very visible and highly respected institutions of higher education. More than 1,000 community colleges in all 50 states now comprise nearly 25% of all colleges and universities in the U.S., with over 6.5 million students, or about 45% of all college students.State and local governance and coordination of community colleges vary from single-state governing boards to minimal state control and strong local governing boards. The relative degrees of state and local control of community colleges generally "follow the money," in that accountability to state and local governing board and state legislatures is generally about proportional to the funds provided by each level of government.Funding for operational support of community colleges comes primarily from state and local governments, with considerable federal support for grants and subsidized loans to students. In 2000-2001, the largest proportional funding sources for community colleges were: state governments (44.6%), local governments (19.5%), tuition and fees (19.5%) and the federal government (5.4%). State lotteries in at least 38 states represent a relatively new source of funds for

community colleges, often in the form of student scholarships.Many of the earliest public junior colleges charged no tuition, especially in California in the early 1900s. Now many community college students pay $3,000 or more per year in tuition and fees, and recent annual tuition increases in many states have been in double digits. This is a troubling trend that threatens to reduce access to higher education for poor people.

Comments. The reference is an overarching view of the historical drivers of community college funding trends and provides tremendous perspective for this study in this regard. The reference is included in the data source for coding and the author's credability credibility is established due to his status as professor emeritus of educational leadership and policy analysis at East Tennessee State University and author of *Fifty State Systems of Community Colleges: Mission, Governance, Funding and Accountaility*.

Vaughan, George B. (2005). (Over)Selling the community college: what price access? *The Chronicle of Higher Education*, *52*(10), B12. Retreived 2010, 2-May from http://chronicle.com/article/OverSelling-the-Community/6997/

Abstract. Part of a special supplement on community colleges. Community-college leaders need to bring enrollments more into line with available resources and stop using inexpensive faculty and courses as a strategy for making ends meet. They should seek to restore balance to the curriculum where it no longer exists and to meet the demands for the courses and programs that are required to provide adequate health care and other services for U.S. citizens and to help maintain the nation's competitiveness in the global market.

Comments. This reference assists the study due to its discussion of the challenges of open access to community colleges in an era of reduced funding. The reference is

included in the coding set for data analysis and is deemed credible due the author's 11 year tenure as president of Piedmont Virginia Community College and as editor of the *Community College Review.*

Violino, B. (2008). Alert!: In emergencies, schooles use technology to get the message out quickly. *Community College Journal , 78* (5), 16-18.

Abstract. This article describes how a growing number of community colleges have begun deploying emergency alert systems that can be used to send information via e-mail and text messaging directly to students' cell phones and other portable devices. Such systems enable authorized campus administrators to send messages to thousands of people within minutes. Systems typically allow messages to be sent to a variety of text communication devices--mobile phones, e-mail accounts, RSS readers, and wireless PDAs--regardless of which communications carrier a subscriber uses. When evaluating and selecting emergency alert systems and services, it's important to consider factors such as which types of devices they support, how easy they are to deploy, and how many devices they can reach.

Comments. This reference plays a main role in the study as one of the works discussing the deployment of ENS at community colleges. The reference is included in the coding set for data analysis. The reference is deemed credible due to the publications clearly defined and objectivity oriented editorial policy for writers. The author, while he is a freelance reporter and writer, wrote several pieces for this periodical both before and after this particular reference. Additionally his background is clearly disclosed in the article and readily available by web search.

Watson, L. M., Melancon, G., & Kinchen, N. (2008). Financing higher education: Three

case studies in a post-disaster recovery environment. *Community College Journal of Research and Practice , 32*, 203-219.

Abstract. This article identifies and articulates the varying funding streams for community technical colleges. In describing the funding issues resulting from Hurricane Katrina's destructive forces, the challenges inherent in complying with funding regulations juxtaposed with the need for fiscal flexibility in a post disaster recovery environment are illuminated.

Comments. This article provides information about funding challenges encountered at community colleges and how that links to the need to serve so many missions in a single institution. Although the article focuses on the Louisiana state colleges post-Katrina the background information is broad based, well documented, and applicable for a national scope. Each of the authors has a master's degree and works either directly within a community college or works in state government providing funding sources for community college systems.

Young, J. R. (2008, April 11). For emergency alerts, some colleges try sirens. Retrieved March 30, 2010, from *The Chronicle of Higher Education*. http://chronicle.com/article/For-Emergency-Alerts-Some/12879

Abstract. Colleges and universities, ever more mindful of campus safety, are installing outdoor sirens. The systems can blast spoken messages or tone alerts of danger--and one of the preset messages on many of the public-address systems warns: "There is a shooter on campus. Seek shelter immediately." As college officials reviewed their emergency-notification strategies in the wake of the deadly shootings at Virginia Tech last spring, many decided to install outdoor public-address systems. The Virginia Tech tragedy, in

which a student killed 32 people before committing suicide, led administrators to think about how they would communicate with their diverse mixes of students, professors, and staff members if a similar tragedy took place on their campuses. One popular answer has been to install complicated digital systems that beam text, e-mail, or instant messages to thousands of registered users. But many officials have come to realize that not everyone on a campus would be at a computer or a cell phone at a given time. Thus, many colleges have decided that the old-fashioned approach of using sirens should be part of the mix of emergency-response technologies. Companies originally designed the high-powered systems to be used on military bases, or at industrial plants where hazardous spills were possible. Systems can be expensive, and some administrators note that the outdoor sirens do not do a good job of getting a message to people inside buildings, since the sound does not always carry through walls. Although siren systems may not work for every college, for many campuses, it is a relatively easy way to bolster response as part of a broader emergency-alert system.

Comments. This article provides information about the need for multimodal ENS. The article discusses institutions that are looking at more "old fashioned" notification technologies such as sirens. Such technologies are interesting because of their broad reach across various campus populations. The reference is deemed credible, as *The Chronicle of Higher Education* is a widely accepted reference for higher education reporting. Additionally the author's credentials as a technology writer are fully disclosed on the website. The author has a master's degree in culture, communication, and technology from Georgetown and writes about the impact of technology on college campuses since 1995 for *The Chronicle of Higher Education.*

Young, J. R. (2008, February 18). What kind of notification system works best when crisis strikes?. Retrieved April 3, 2010, from *The Chronicle of Higher Education*. http://chronicle.com/article/What-Kind-of-Notification-S/511/

Abstract. (Wally) Czerniak was attending a conference in Arizona where he was learning, among other things, about emergency-notification systems that can send text messages to cellphones - a method that a growing number of colleges have set up since the shootings last spring at Virginia Tech. But Mr. Czerniak still isn't sure whether such a system would have done much good in keeping people on campus updated as the crisis unfolded if it had been in place at Northern Illinois.

Comments. This is a foundational reference about the first year after Virginia Tech and the discovery of difficulties with SMS based ENS. The article breaks that mold to discuss alternate technology such as loudspeakers. The reference is deemed credible, as *The Chronicle of Higher Education* is a widely accepted source for higher education reporting. Additionally the author's credentials as a technology writer are fully disclosed on the website. The author has a master's degree in culture, communication, and technology from Georgetown and writes about the impact of technology on college campuses since 1995 for The Chronicle of Higher Education.

Review of the Literature

This section of the study presents the results of the analysis of literature selected for coding, as described in the Data Analysis Plan, located in Research Parameters. The objective is to organize these findings in the form of a guide, designed as a set of recommendations regarding the planning and implementation of ENS within a community college environment. The review of literature is written using a thematic approach in which the prominent findings are organized and presented in the form of key factors for consideration (Literature review, n.d.), The factors are organized under two larger themes: (a) factors surrounding the implementation and planning of ENS and (b) factors relating to the mission of community colleges in an era of reduced state funding.

The knowledge gleaned from analysis of selected literature published largely between 2005 and 2010, and guided by the work of Page (2008) and Staman et al. (2009), is synthesized to provide eleven key factors to consider related to planning and implementing an ENS in a community college environment. The first six factors pertain to all types of higher education institutions: three key factors are presented related to ENS planning, including: (a) technology selection, (b) hazard assessment and selection, and (c) academic culture. These are followed by three key factors related to ENS implementation, including: (a) SMS technology, (b) adoption rates, and (c) funding challenges. Five key factors are presented that distinguish community colleges from their four-year peer institutions. Three key factors are presented related to community college funding, including: (a) reduced state funding, (b) full time equivalent and funding formulas, and (c) nationwide funding trends. These are followed by two key factors related to the community college mission, including: (a) broad nature of mission, and (b) sustainable open access.

A final set of recommendations, derived from the results of the data analysis, is presented in the Conclusions section of the study. These recommendations are framed as a guide to be used by IT and Campus Security management personnel who are charged with the responsibility of planning and implementing an ENS in a community college setting.

Three Key Factors Related to ENS Planning in General

After the September 11, 2001 attacks on New York a significant amount of work was performed at numerous universities across the United States to improve emergency management plans (Mitroff et al., 2006). These plans were modified after the Virginia Tech shootings in mid-2007 to include new scenarios and technologies to help provide more accurate information to campus populations quickly (Hermann, 2008). The following three key factors concern ENS planning.

Factor #1: Technology Selection. As Page noted in 2008 when speaking of college and university administrator adoption of ENS technology after the Virginia Tech shootings, "Vendor applications offer a plethora of opt-in services that can push emergency messages to cell phones via text messages, e-mail accounts, instant message accounts, or college or university voicemail systems" (p. 9). Each technology within this diverse group has strengths and weaknesses as discussed in the literature. This portion of the study examines four frequently noted technologies: (1) short message service (SMS), (2) loudspeakers, (3) digital signage, and (4) social networking sites.

SMS technology is extremely popular with college students (Latimer, 2008) and with colleges and universities (Bambenek & Klus, 2008). Next to an e-mail based notification, an SMS based ENS is the most popularly deployed solution (Staman et al., 2009) at higher education institutions. However, as several authors note (Bambenek & Klus, 2008, Latimer

2008, Staman et al., 2009), SMS based systems are limited by low student adoption rates (Staman et al., 2009), delayed messages (Latimer, 2008; Molinski, 2008), security risks (Bambenek & Klus, 2008), and a limited message length of 160 characters (Latimer, 2008).

Two other technologies featured in the literature are *siren or loudspeaker systems* (Campus Safety Magazine, 2009; Young, February 2008; Gnage et al., 2009; Young, April 2008) and *digital signage or visual based notification systems* (Staman et al., 2009; Young, August 2008). Simple, inexpensive overhead public address speakers are capable of sending in messages within a building or multiple buildings, as used at West Virginia University: Parkersburg (Gnage et al., 2009). Complex, redundant linked, loud outdoor siren towers (Young, February 2008) are capable of both sirens and auditory instructions that can cover a large campus environment and immediately adjacent neighborhoods, as used at Norwich University (Young, April 2008) but typically cost more than $100,000 (Young, April 2008). Digital signage or other visual alerts are also used in classrooms and public spaces (Page, 2008) at Virginia Tech and Brigham Young University. These deliver messages to televisions, projectors, or electronic message boards (Molinski, 2008; Staman et al., 2009).

A fourth technology for consideration is *social networking sites* including Facebook and MySpace (Page, 2008; Staman et al., 2009). Young (August, 2008) cites a UCLA graduate student who shares that these sites were often the only way to obtain information in the aftermath of Hurricane Katrina when all cellular and land-based voice communication networks did not function. However, care needs to be taken with site security so that the collaborative nature of social networking does not lead to the distribution of false information during an emergency (Page, 2008; Young, August 2008).

Factor #2: Hazard Assessment & Selection. This factor examines noted methodologies for planning ENS to react to hazards. Page (2008) cites the International Association of Emergency Managers (IAEM), as recommending a *comprehensive approach* to assessing the hazards presented to a college or university. Comprehensive is defined by the IAEM as cited in Page (2008) as:

> Taking into account the full range of hazards and campus vulnerabilities while preparing a response that encompasses all assets (cyber, human, and physical) and members of the campus community (from students, faculty, and staff to visitors and adjacent neighborhoods). (p. 7)

Young (April 2008) also notes that ENS planning at the University of Iowa "involves imagining morbid scenarios" (para. 18) in order to prepare pre-recorded response messages. Hermann (2008) reinforces this recommendation in her discussion of the emergency planning at Adelphi University and their utilization of an "all hazards" approach in their ENS.

Factor #3: Academic Culture. This factor focuses on the open nature of higher education campuses (Page, 2008). Page (2008) also notes that the constant yearly turnover of the student population and regular outside visitors places unique challenges on any plans to secure a college or university. Campus Safety Magazine (2009) reports that amongst reasons given by schools without an ENS, buy-in from students and staff is listed in the top ten. Any plans for deployment of an ENS must "…strike a balance between the open, research-driven nature of their enterprise and the need to foster a safe campus environment" (Page, 2008, p. 14).

Another struggle that is faced in an academic culture is that of keeping up with the current generation of students (Page, 2008). Page (2008) states that "[institutional leaders] are also faced with a constantly evolving slate of technological solutions" (p. 9). As Latimer (2008)

notes, no single technology solution will reach 100% of a campus population. As an example some students may not be able to afford the cell phones that are required to receive SMS texts (Galuszka, 2007). So any ENS plan must meet the challenge of keeping up with student technology shifts and connecting with students of many cultures and languages (Page, 2008).

Three Key Factors Related to ENS General Implementation

Installation of multiple ENS at many colleges and universities has occurred in the years since the Virginia Tech shootings (Bambenbek & Klus, 2008). There have also been several documented emergencies on college and university campuses during which the institution used their ENS, including a shooting at Northern Illinois University (Bambenek & Klus 2008; Staman et al., 2009), a shooter threat at Saint Peter's College (Molinski, 2008), and fires near Pepperdine University (Latimer, 2008). These usages provide insight into weaknesses, strengths, and potential improvements to be made to ENS deployments. The following three key factors concern ENS implementation.

Factor #4: SMS Technology. There are several pieces of literature (Bambenbek & Klus, 2008; Latimer, 2008; Traynor, 2008) focused on SMS and its popularity as an ENS solution (Bambenbek & Klus, 2008). However, this technology is not a panacea for solving the need of an ENS (Latimer, 2008) and does come with some challenges regarding security (Bambenbek & Klus, 2008; Traynor, 2008) and capacity (Traynor, 2008).

Traynor (2008) notes that SMS by design is an unsecure means of communication. It is based on a simple protocol, capable of delivering 160 characters of information from device to device (Bambenbek & Klus, 2008; Latimer, 2008). As Bambenbek and Klus (2008) state "it [SMS] was never designed for high-stakes communication" (p. 12). Furthermore most SMS are capable of receiving e-mail based messages that are also cited as "inherently insecure and easy to

forge" (Bambenbek & Klus, 2008, p. 14). Both Bambenbek and Klus (2008) and Traynor (2008) cite examples of forged messages that closely resemble actual alert messages.

Cellular systems in general are not designed to handle the traffic load that occurs during an emergency (Traynor, 2008). Latimer (2008) notes that SMS and cellular telephone traffic use and compete for the same network bandwidth. Despite the perception that SMS does not affect a busy cellular network (Traynor, 2008), the reality is that cellular providers cannot cost-effectively scale their networks to accommodate emergency load (Traynor, 2008). Nor can SMS handle a one-to-many message delivery structure (Traynor, 2008), which would greatly reduce the network load.

Factor #5: Adoption Rates. Selingo (February, 2008; Violino, 2008) states that some colleges and universities experienced low sign up rates following the deployment of an ENS. This factor focuses on the challenges faced by colleges and universities in getting students to voluntarily sign up for ENS alerts.

As Latimer (2008) notes there are three differing models of participation: no confirmation opt-in, confirmation required opt-in, and mandatory (also known as opt-out). The movement from one model to another changes one of two metrics: enrollment rate, or the rate at which persons volunteer information, and participation rate, or the rate at which persons respond to confirmations (Latimer, 2008). Latimer (2008) further cites that the University of Notre Dame's participation rate went "from 62 percent to 99.8 percent on a 90 percent voluntary enrollment Rate" (p. 85) by switching to an opt-out model. Staman et al. (2009) reinforces this view via a survey noting that the participation difference between lower opt-in rates versus higher opt-out rates reaches almost 60%. There is also the consideration that incoming classes of students will

adopt the technology at a greater rate than those in the prior class, as experienced at Princeton (Selingo, February 2008).

Factor #6: Funding Challenges. It is noted that the cost of installing some ENS systems can be expensive (Young, February 2008). Since multiple modes of ENS can be needed to effectively reach all campus populations (Latimer, 2008; Staman et al., 2008), the total cost of ENS at a college may be the sum of several individual systems. A survey by Campus Safety Magazine (2009) regarding ENS notes that of all the challenges experienced with an ENS, cost is viewed as the largest issue. Additionally, the survey cites that almost 60% of responders fund their ENS out of their general fund (Campus Safety Magazine, 2009), which removes those dollars from being used for other academic or institutional purposes. Twenty-four percent of responders also cited cost as why ENS was not added or upgraded (Campus Safety Magazine, 2009).

Galuszka (2007) states that the range of a system can be "a few thousand dollars for a small college to about $100,000 per year for a major university" (p. 16) but notes also that this cost may not be that significant. Young (February 2008) reinforces this evidence and notes that the loudspeaker system installed at Virginia Tech cost approximately $25,000 for a single set and that most large campuses would need several. Virginia Tech also spent $200,000 with a notification company for a three year notification contract (Galuszka, 2007).

Three Key Factors Unique to Community College Funding

Community colleges in the United States are unique institutions in the realm of higher education (Askin, 2007). They are able to utilize local funding that is not generally available to an ordinary four year college or university (Askin, 2007) and they provide a broad range of local low cost education, remedial education, job training, and entry level collegiate education

(Shaffer, 2009). Paradoxically they also receive a lower level of funding than four year institutions (Snyder & Dillow, 2010) and their broad mission can lead to confusion both inside and outside of a community college culture (Reitano, 1990).

The American community college system receives funding by a unique mix of state and local government funding, student tuition, and other funding sources (Askin, 2007). Community colleges are under increased pressure to justify their usage of state tax dollars (Mullin & Honeyman, 2008), which pushes them to try complete the same mission with less funding (Watson et al., 2008), including providing ENS. This section examines the funding reductions occurring in public sector education, the unique ways community college funding occurs, how it differs in quantity from four year institutional funding, and how funding cuts impact community college programs and students. The information is reinforced by examination of overall state and national education funding trends.

Factor #7: Reduced State Funding. As a generality the largest historical portion of community college funding originated from local funding, with only limited funding originating from student tuition and state support (Tollefson, 2009). This factor examines the historical trend of shifting funding sources and the recent trend of state funding reductions.

Cohen and Brawer (2003) (cited in Tollefson, 2009) show that during the latter half of the twentieth century the trend of funding community colleges from local sources changed to community colleges be funded from state sources. As an example, Cohen and Brawer (2003) (cited in Tollefson, 2009) document how California shifted from more than 90% local based funding to less than 20% local based funding between 1918 and 1980 (in Tollefson, 2009, p. 393). State support made up the difference and rose steadily after World War II from 28% in 1942 to 60% in 1980 (Cohen & Brawer, 2003, as cited in Tollefson, 2009, p. 393). By 2009,

Tollefson notes "Income from student tuition and fees appears to have stabilized at approximately 20% of community college operating revenue. State funding has seemingly leveled off at around 45%. Local funding has varied between 18% and 20% in recent years" (Tollefson, 2009, p. 393).

At a macro level, examples of the practical implications of such funding changes are indicated in a report issued by the Oregon Department of Community Colleges and Workforce Development (n.d.) for the 2009-2011 fiscal biennium. The report notes funding levels averaging slightly close to those cited in Tollefson with 48% from the state, 31% from tuition, and 22% from local funding (Oregon Department of Community Colleges and Workforce Development, n.d.). The report further cites three outcomes from the budget noted in the report: (a) younger Oregonians in 2009 are less likely to have degrees than older Oregonians in 2005, (b) the chance of a younger Oregonian attending college is less than ten years prior, and (c) the cost of tuition has risen 99% over the course of ten years (Oregon Department of Community Colleges and Workforce Development, n.d.). Changes such as these are particularly acute in community colleges, which serve a large number of lower income students (Baum & Ma, 2009).

As a possible solution Askin (2007) notes that dual funded institutions, meaning those that receive a more balanced mix of state and local funding, experience success in lowering tuition and providing better access to poorer students (p. 995). Also noted is the link to open access and that dual funded institutions seem more capable of meeting this need going forward (Askin, 2007).

Factor #8: Full Time Equivalent and Funding Formulas. Watson et al. (2008) indicate that most American community colleges are funded based on the concept of full time equivalency. FTE is frequently the basis for funding formulas (Vaughan, 2005), which state

legislators use to allocate dollars out of a state general fund (Watson et al., 2005). This factor examines the use of FTE based funding formulas, trends in funding formula reductions, and the overall outcome of the use of funding formulas in regard to setting community college funding levels.

Mullin and Honeyman (2008) conclude that there is an overall shift in the use of funding formulas. As of 2007 there were forty states using funding formulas (Mullin & Honeyman, 2008, p. 514). The only state that funded community colleges directly based on need is Utah, which ceased using funding formulas completely (Mullin & Honeyman, 2008, p. 520). However these funding formula obligations, from state treasury to community colleges, are not always being met. Selingo (November 2008) cites a survey conducted by the National Council of State Directors of Community Colleges that states that 18 states did not fully meet their funding formula obligations in 2007-08. The survey also notes that community colleges received the largest budget cuts of any sector of public education and that the courses most affected will be those described as fine arts and vocational, technical, and occupational due to their higher delivery cost per course (Selingo, November 2008).

One piece of literature suggests that community colleges institute a limit to enrollment (Vaughan, 2005), which would make community colleges practice more like their four year brethren and run counter to the community college mission of open access (Horn, & Li, July, 2009). Vaughan (2005) also notes that the model of funding formulas where FTE count drives funding lends itself to a dangerous cycle where greater numbers of community college students are enrolled in less costly remedial courses taught by part-time faculty. This is at the expense of more costly areas of instruction, thus reducing the overall scope of mission at the college but ironically increasing the college state funding under a formula system (Vaughan, 2005).

Vaughan (2005) states that the Virginia Community College System mentions that Virginia's community colleges are expecting an additional 40,000 students and will begin to limit enrollment in traditional core open access disciplines such as mathematics and the liberal arts. This trend continues in more recent years with another large community college exploring a limit to enrollment (Miami Dade College, 2009). Even with recent federal stimulus assistance it is still felt that open access to community colleges is in danger due to funding issues (Katsinas & Tollefson, 2009).

Factor #9: Nationwide Funding Trends. In addition to the trends noted in Tollefson (2009), other research suggests a nationwide disparity in higher education funding between two year and four year colleges. This factor briefly examines the data indicative of this trend and outcomes, specifically at rural community colleges.

Selingo (November, 2008) notes that the National Council of State Directors of Community College's survey reflects a funding decline of 1.8% for "flagship universities" and 3.7% for state colleges (para. 3) compared with a 5.2% decline for community college funding (para. 3). Further evidence is provided by Snyder and Dillow (2010), who note that despite enrolling more than 30% of all the nation's postsecondary students (Table 187), community colleges receive funding at one-third the level of four-year institutions on a per FTE basis (Table 362).

The decrease in overall funds impacts all community colleges, but most severely affects rural community colleges (Katsinas, 2007; Selingo, November 2008) which need to provide many of the same services, including ENS (Gnage et al., 2009), as their urban and suburban counterparts. Katsinas (2007) notes that the increases in community college tuition to make up support are driving students with debt ratio above 60% compared with an average 18.5% for

urban and suburban community college students (para. 21). The funding cuts, combined with the need to support other programs such as workforce retraining, are pulling fiscal and productivity resources that previously might be dedicated to other college needs (Katsinas, 2007).

Two Key Factors Unique to the Community College Mission

As Mullin and Honeyman (2008) note, community colleges are squeezed out of the primary education space by traditional high schools and out of the post-secondary education space by traditional four-year colleges. This leaves the community college with a mission that is, as Reitano (1990) notes, "outside the mainstream of higher education, and in some ways they still are" (p. 120). This section focuses on the broad nature of the community college mission with a focus on sustaining the open access of community colleges.

Factor #10: Broad Nature of Mission. There are several works that note how broadly diversified the community college mission is defined. Shaffer (2009) notes "community colleges are the grab bag of U.S. higher education" (p. 4). He goes on to break down the mission of a community college under six different categories, which are similar to those defined in Reitano (1990) and Watson et al. (2008). This factor briefly explores those categories as a means of defining the community college mission as it differs from traditional four year colleges and universities.

Watson et al (2008) conclude succinctly "community colleges struggle to be all things to all people" (p. 207). The work goes on to cite Richardson and Leslie's (1980) (cited in Watson et al., 2008) definition of the six roles of community colleges as "(a) developmental education, (b) community service, (c) academic transfer to 4-year institutions, (d) continuing education, (e) assessment of skill training, and (f) vocational/technical education" (p. 207). Almost 30 years after Richardson and Leslie, these same roles are noted again, although with some changed

names, such as developmental education is now remedial education (Shaffer, 2009). However the concepts and scope of the mission are not more focused upon any particular area, such as job training, over another (Shaffer, 2009).

The mission of community colleges is inherently chaotic (Reitano, 1990, p. 119), however it is also noted that community colleges serve a purpose by those goals by providing access to all, urban, suburban, rural, at any time of day, on almost any day of the week (Reitano, 1990). This level of open access stands opposed to the traditional four year college that Reitano (1990) notes as "…nestled on an idyllic campus in a pastoral setting where the best minds were expected to pursue great thoughts safely separated from the real world" (p.121). Reitano (1990), like Shaffer (2009), concludes that there is a need for a focus in community colleges on more practical pursuits such as job training. However, a balanced approach is called for that educates liberal arts and the sciences as the foundation upon which career training is built (Reitano, 1990).

Factor #11: Sustainable Open Access. The link between access and public funding in the community college environment is critical and most all public two year colleges receive public funding (Mullin & Honeyman, 2008). This factor examines the concept of open access as related to funding, distinguishing community colleges from four year colleges and universities, and briefly examines possible methods of providing a sustainable model of open access.

Open access is a key tenant of American community colleges as it provides an open enrollment policy for most all students (Vaughan, 2005) and is largely made possible by providing a lower cost means to an education (Joshi, Beck, & Nsiah, 2009). The support from state coffers that make this possible is in decline over the past 30 years (Katsinas, 2007). The more a community college is funded by a mix of state and local funds, the better it provides access to the broadest range of constituents (Askin, 2007).

Data shows that community colleges are among the most affordable methods of higher education (Baum & Ma, 2009). This makes them an important resource for students from families of lower incomes (Joshi et al., 2009). Tollefson (2009) argues that the students of community colleges come from all across the economic spectrum and that the impact of large tuition increases at community colleges may drive away some portion of those students. Askin (2007) believes that if any student cannot enroll at a community college due to cost concerns, the college has lost its fundamental ability to provide open access (Askin, 2007). Askin (2007) also notes that dual-funded community colleges are better able to keep tuition low and meet the requirement to provide access.

Conclusions

Brief History of ENS Emergence in Academia

Since the late 1990's there are several high profile examples of emergencies in the arena of education (Mitroff et al., 2006). The first reference point cited for the beginning of these incidents is often noted as the September 11, 2001 terrorist attacks on New York and Washington, DC, followed by Hurricane Katrina in 2005. These events represent the start of more focused discussion of emergency preparedness on higher education campus (Fischer & Wilson, 2007, Mitroff et al., 2006).

It is the campus shootings at Virginia Tech in 2007, however, that refocus that effort from preparedness to rapid population notification via ENS (Chretein, 2008). After the Virginia Tech shootings, a state report calls for an "alerting system" (Virginia Tech Review Panel, 2007) utilizing multi-modal communications including SMS based text messaging, instant messaging (IM), email, voice, and web posting (Virginia Tech Review Panel, 2007). During the following year many colleges begin to sign with vendors to deliver automated alerts to their community populations (Selingo, February 2008) and community colleges begin to setup alerting systems as well (Halligan, 2009). Campus technology and security leaders begin to meet (Page, 2008) to evaluate practices, share experiences, and find solutions to their shared challenge of alerting a diverse and constantly changing population (Page, 2008). It is within this environment of institutional practices and study that this review of literature focuses on ENS planning and implementation, specifically within the community college environment.

This study focuses on ENS planning and implementation within the scope of a community college environment with limited public funding and a broad mission. The goal is to provide for IT and campus safety managers a guide based on recommendations gleaned from

factors revealed in the literature. Below are recommendations based on the eleven factors from the literature review and guided by the two themes of this study.

Recommendations for Planning and Implementation of Emergency Notification Systems

Recommendation #1: Select the Simplest Technology Solutions. *It is critical to select the most appropriate technology for the scale and complexity of the community college environment.* Staman et al. (2009) set a solid footing for this recommendation via a multi-campus survey which recommends a simple to use system that communicates in as many different modes as possible. This is reinforced by Gnage et al. (2009) and their recommendation of a "simple yet effective" (p.949) ENS for delivering indoor/outdoor notifications at a rural West Virginia community college. This is especially true at community colleges with broad missions (Watson et al., 2008) and student bodies that often differ widely in economic status, age, and race (Horn & Li, July 2009).

Recommendation #2: Conduct Hazard Assessment and Preparation. *It is recommended that a community college be prepared in advance for a broad range of hazards and emergency events.* Even before the Virginia Tech shootings in 2007, Mitroff et al. (2007) recommended that campuses form emergency management teams and plans before events happen. Page (2008) also notes, "campuses must begin to think proactively" (p.14). Large universities also share this view, such as when they prepare automated responses to varying emergency scenarios in advance (Young, 2008).

Recommendation #3: Protect the Open Academic Culture. *It is recommended that community colleges select flexible technologies, review plans frequently, and try to strike a balance between openness and security.* Community college students are often less affluent than those at four year colleges (Galuszka, 2008) and ENS technology cannot leave them behind.

Equally as important college environments are complex (Page, 2008) and this requires frequent reviewing of plans so they can be adapted to any changes. Finally, the need for safety cannot outweigh the need for academic freedom and an open-learning culture and vice-versa, so a balance must be struck between these elements (Page, 2008).

Recommendation #4: Understand SMS Technology Weaknesses. *It is important that a community college not focus solely on a single vendor SMS based ENS solution and instead find multiple methods of communication in emergency situations*. There are inherent weaknesses in SMS technology (Traynor, 2008; Bambenek & Klus, 2008) and the failures of these systems are well documented (Latimer, 2008). This is not to say that a SMS based solution is not useful. However, the weaknesses should be noted and a college needs multiple methods of communication (Latimer, 2008).

Recommendation #5: Use an Opt-Out Model to Increase Adoption Rates. *It is critical that an opt-out method of ENS adoption be utilized to maximize the reach of the system.* It is well documented that SMS systems with opt-in based sign-up methodologies experience approximately 50% adoption rates (Campus Safety Magazine, 2009; Latimer, 2008; Staman et al., 2009). It is also noted that this is easily almost doubled by using an opt-out model (Latimer, 2008), which still allows for the individual to maintain control of any notifications they receive.

Recommendation #6: Consider Costs and Funding Sources. *It is recommended that system selection bear in mind cost and funding sources, as ENS is often expensive and is an ongoing expense.* As noted above, the system should be appropriate to scale of the community college. This also applies to the cost of the system, which is often expensive (Campus Safety Magazine, 2009; Young, April 2008). Implementation also needs to consider the internal college funding source as it is noted that internal funding is often an issue in future ENS deployment or

expansion (Campus Safety Magazine, 2009).

Recommendations for Unique Factors of Community Colleges

The recommendations for the factors below involve national issues about community college funding, support, and mission. The true solutions to these issues are beyond the scope of this study. However, the issues themselves are at the root of what makes community colleges distinct from four year institutions and are therefore relevant when accounting for the community college setting. More importantly, each has a large impact on a community college's capability and methods to deliver instruction, services, and support to students, including ENS, and all are highly interconnected.

Recommendation #7: Understand the Impact of Reduced State Funding. *It is key to understand that state funding sources have been shrinking since the 1960's* (Tollefson, 2009) *and other funding mechanisms for ENS should be examined.* The lack of consistent state funding dollars, which hovers near an average 50% (Tollefson, 2009) of total funding support, is making it more difficult for community college's to deliver all manner of programs and support services (Gnage et al., 2009), including ENS. Campus Safety Magazine (2009) notes that 12% of survey respondents pay for their ENS solution via grants and a few (1.4%) pay for them with bond funding (p.26). Moving towards these other funding sources can be important as college funding continues to support so many college needs (Katsinas, 2007).

Recommendation #8: Understand the Impact of Full Time Equivalent and Funding Formulas. *It is critical to be aware of the role funding formulas play in determining community college funding and on college access.* Funding formulas are pervasive throughout the United States for funding community colleges (Mullin & Honeyman, 2008). However most states are cutting college funding (Jaschik, 2009) and community colleges are being cut more severely than

other education sectors (Selingo, November 2008). Similar to factor #7, it maybe necessary to seek other funding sources for ENS.

Recommendation #9: Consider the Ramifications of Increased Tuition. *It is important to note that tuition increases are making up the difference in funding at community colleges.* Despite educating 30% of the nation's students, community colleges are not funded by states per FTE at the same level as four year colleges and universities (Snyder & Dillow, 2010). This factor is a driver for higher tuition, and the rising tuition is especially difficult at rural community colleges (Katsinas, 2007; Selingo, November 2008). Wages tend to be less in rural areas, so the higher tuitions tend to present fiscal challenges for students (Katsinas, 2007) and may limit access to technology. The reduced funding also means that the college may not have the resources or time for other programs (Katsinas, 2007) such as ENS.

Recommendation #10: Respect the Broad Nature of Mission. *It is critical to know that a community college is multifaceted and this brings in a diverse range of students needing learning and support services, including ENS.* Watson et al. (2008) note Richardson and Leslie's (1980) discussion of six roles for community colleges in America. These six roles define the community college mission, which is fundamentally unfocused (Reitano, 1990). Despite calls for a more workforce training based focus (Shaffer, 2009), community colleges also serve valuable, more traditional, higher education missions (Reitano, 1990), and these are rooted in the foundations of the community college concept in America (Tollefson, 2009).

Recommendation #11: Maintain Sustainable Open Access. *It is necessary to recognize the importance of open access at a community college as it draws in students of lower incomes who may not have access to technology used by ENS.* Open access is a key foundation of the community college mission (Tollefson, 2009). Low tuition ensures universal open access

(Baum & Ma, 2007) and is critical to providing education those with lower incomes (Joshi et al., 2009). Askin (2007) notes that true open access can only be maintained if a student can be enrolled in community college classes without a restrictive admission process, balancing state and local funding can help solve this problem. This approach is in contrast to recent calls for limiting admissions to match state funding (Vaughan, 2005).

References

Askin, J A., (2007). Community college mission: re(S)ources make a difference, *Community College Journal of Research and Practice , 31*, 977-997.

Bambenek, J., & Klus, A. (2008). Do emergency text messaging systems put more students in danger? *EDUCAUSE Quarterly , 31* (3), 12-16. Retrieved April 6, 2010, from http://www.educause.edu/EDUCAUSE+Quarterly/EDUCAUSEQuarterlyMagazineVolum/DoEmergencyTextMessagingSystem/163097

Bastek, N. (2010). Writing guide: review paper for the biological sciences. *Colorado State University Writing Guide*. Retrieved May 2, 2010 from http://writing.colostate.edu/guides/documents/review_essay/

Baum, J., & Ma, J. (2009). Trends in college pricing. Retrieved April 1, 2010, from *The College Board*: http://www.trends-collegeboard.com/college_pricing/

Bell, C., & Smith, T. (2009). Critical evaluation of information sources. University of Oregon Libraries. Retrieved April 19, 2010 from http://libweb.uoregon.edu/guides/findarticles/credibility.html

Busch, C., De Maret, P., Flynn, T., Kellum, R., Le, S., & Meyers, B., Saunders, M., White, R., (2005). Conceptual analysis. Colorado State University Writing Guide. Retrieved April 23, 2010 from http://writing.colostate.edu/guides/research/content/com2b1.cfm

Campus Safety Magazine (2009). *Mass notification survey 2009*. Campus Safety Magazine. Retrieved April 3, 2010 from http://www.campussafetymagazine.com/files/resources/Mass_Notification_Survey.pdf

Chretien, W. (2008). Get the word out. *Campus Technology, 22*(1), 30-32,34,36,38-39: Retrieved

2010, 30-March from http://campustechnology.com/Articles/2008/09/Get-The-Word-Out.aspx

Community College Journal. (2008). Virginia task force issues campus safety guidelines. *Community College Journal , 78* (6), 8.

Fischer, K. & Wilson, R., (2007, September 7). Va. Tech was slow to respond to gunman, panel finds. *The Chronicle of Higher Education*, *54*(2), A1. Retrieved April 3, 2010, from http://chronicle.com/article/Va-Tech-Was-Slow-to-Respon/19684

Galuzka, P. (2008). Emergency notification in an instant. *Diverse Issues in Higher Education , 25* (2), 14-17.

Gnage, M., Dziagwa, C., & White, D. (2009). Safety on a rural community college campus via integrated communications. *Community College Journal of Research and Practice , 33*(11), 948-950.

Halligan, T. (2009). Safety systems: technologies, programs help colleges react in emergencies. *Community College Journal , 79* (6), 16-18.

Herrmann, M. (2008). *Ready, set, respond*. University Business Magazine. Retrieved April 3, 2010, from http://www.universitybusiness.com/viewarticle.aspx?articleid=1039

Horn, L., & Li, X. (July, 2009). *On track to complete? A taxonomy of beginning community college students and their outcomes 3 years after enrolling: 2003–04 through 2006.* U.S. Department of Education: Institute of Education Sciences, National Center for Education Statistics. Washington, DC: National Center for Education Statistics.

Horn, L. & Li, X. (November, 2009). *Changes in postsecondary awards below the*

bachelor's degree: 1997-2007. U.S. Department of Education: Institute of Education Sciences, National Center for Education Statistics. Washington, DC: National Center for Education Statistics.

Jaschik, S. (2009). *The states pull back*. Inside Higher Ed. Retrieved May 22, 2010, from http://www.insidehighered.com/news/2009/01/09/approps

Joshi, P. V., Beck, K. A., and Nsiah, C. (2009). Student characteristics affecting the decision to enroll in a community college: economic rationale and empirical evidence. *Community College Journal of Research and Practice*, *33*(10), 805-822.

Katsinas, S. (2007). Rural community colleges are the land-grant institutions of this century. *The Chronicle of Higher Education, 54*(9), B26. Retrieved 2010, 22-May from: http://chronicle.com/article/Rural-Community-Colleges-Are/25806/

Katsinas, S. and Tollefson, T. (2009). *Funding and access issues in public higher education: a community college perspective*. Retrieved June 18, 2010 from, The Education Policy Center at The University of Alabama: http://education.ua.edu/wp-content/uploads/2010/01/Funding-and-Access-Issues-in-Public-Higher-Education-2009-24-09.pdf

Latimer, D. (2008). Text messaging as emergency notification superstar? Nt so gr8. *Educause Review, 43*(3), 84-85.

Literature Reviews. (n.d.) The Writing Center. University of North Carolina at Chapel Hill. Retrieved April 19, 2010 from http://www.unc.edu/depts/wcweb/handouts/literature_review.html

Miami Dade College (2009). Facing Unprecedented Budget Cuts and Surging Enrollment, MDC

Cancels its Upcoming Open House. Miami Dade College. Retrieved June, 18, 2010 from http://www.mdc.edu/main/news/articles/2009/05/open_house_canceled.asp

Mitroff, I. I., Diamond, M. A., & Alpaslan, C. M. (2006, Jan-Feb). How prepared are America's colleges and universities for major crises? Assessing the state of crisis management. *Change: The Magazine of Higher Learning , 38* (1), 61-67.

Molinski, S. (2008). Leveraging technology and human systems in an emergency. *EDUCAUSE Quarterly , 31* (3), 63-65.

Mullin, C. M., & Honeyman, D. S. (2008). The funding of community colleges: formulas & governance. *Community College Journal of Research and Practice , 32* (7), 512-524.

Obenzinger, H. (2005). What can a literature review do for me? Stanford University. Retrieved April 17, 2010, from http://ual.stanford.edu/pdf/uar_literaturereviewhandout.pdf

Oregon Department of Community Colleges and Workforce Development (n.d.). *Oregon community college budget picture: 2009-2011*. Retrieved May 23, 2010, from Oregon Department of Community Colleges and Workforce Development: http://www.oregon.gov/CCWD/pdf/Budget/BudgetPicture2009-2011.pdf

Oxford English Dictionary. (n.d.). *best, a. and adv.* Retrieved April 17, 2010, from Oxford English Dictionary: http://dictionary.oed.com/cgi/entry/50020980/50020980se120?single=1&query_type=word&queryword=best+practice&first=1&max_to_show=10&hilite=50020980se120

Page, C. (2008, 16-October). The role of IT in campus security and emergency management. Retrieved 2010, 2-April from *Educause:* http://www.educause.edu/Resources/TheRoleofITinCampusSecurityand/163282

Reitano, J. R. (1990). The community college mission: access or anarchy? *Community*

Review , 10 (1-2), 119-126.

Schneider, T. (2010, January). *Mass notification for higher education.* Retrieved April 17, 2010 from National Clearinghouse for Educational Facilities: http://www.edfacilities.org/pubs/notification.pdf

Selingo, J. J. (2008, 12-February). College leaders wrestle with how to prepare for unknown threats. *The Chronicle of Higher Education*, *54*(2), A1. Retrieved 2010, 2-April from http://chronicle.com/article/College-Leaders-Wrestle-With/496

Selingo, J. J. (2008, 7-November). State budgets are likely to squeeze 2-year colleges. *The Chronicle of Higher Education*, *55*(11), A1. Retrieved May 22, 2010 from http://chronicle.com/article/State-Budgets-Are-Likely-to/14984/

Shaffer, D. F. (2009). Community college mission needs clairity from the top. *Community College Week* , *22*(5), 4.

Smith, L. L., & Millar, D. P. (2005). Plans that work. *Community College Journal* , *75*(4), 32-35.

Snyder, T., & Dillow, S. (2010). Digest of education statistics, 2009. U.S. Department of Education: Institute of Education Sciences, National Center for Education Statistics. Washington, DC: National Center for Education Statistics.

Staman, M., Katsouros, M., & Hach, R. (2009). The multi dimensional nature of emergency communications management. *EDUCAUSE Review , 44* (1), 49-63.

Tollefson, T. A. (2009). Community college governance, funding, and accountability: a century of issues and trends. *Community College Journal of Research and Practice*, *33*(3), 386-402.

Traynor, P. (2008, Sept). *Characterizing the limitations of third-party EAS over cellular text messaging services.* Retrieved 2010, 17-April from UC Davis: Safety Services: http://safetyservices.ucdavis.edu/emergency-management/dru-1/alert notification/Characterizing_the_Limitations_of_3rd_Party_EAS-Traynor_Sept08.pdf

Vaughan, G. B. (2005). (Over)Selling the community college: what price access? *The Chronicle of Higher Education*, *52*(10), B12. Retreived 2010, 2-May from http://chronicle.com/article/OverSelling-the-Community/6997/

Violino, B. (2008). Alert!: In emergencies, schooles use technology to get the message out quickly. *Community College Journal , 78* (5), 16-18.

Virginia Tech Review Panel (2007). *Mass shootings at Virginia Tech, April 16, 2007: Report of the Virginia Tech review panel.* Virginia Tech Review Panel. Retrieved 2010, 11-April from http://www.vtreviewpanel.org/report/index.html

Watson, L. M., Melancon, G., & Kinchen, N. (2008). Financing higher education: three case studies in a post-disaster recovery environment. *Community College Journal of Research and Practice , 32*, 203-219.

Young, J. R. (2008, 18-February). What kind of notification systems works best when crisis strikes? *The Chronicle of Higher Education.* Retrieved 2010, 2-April from http://chronicle.com/article/What-Kind-of-Notification-S/511/

Young, J. R. (2008, April 11). For emergency alerts, some colleges try sirens. *The Chronicle of Higher Education*, *54*(31), A22. Retrieved March 30, 2010, from http://chronicle.com/article/For-Emergency-Alerts-Some/12879

Appendix A

Search Results Summary

Source	Search Term	Results	Comments
UO OneSearch/Education	"emergency notification"	Top Results (34) ERIC (0) Education Abstracts (10) Academic Search Premier (68)	General Sources 9 good Sources
UO OneSearch/Education	"emergency notification" AND "community college"	ERIC (0) Education Abstracts (1) Academic Search Premier (0)	Not Useful
UO OneSearch/Education	"emergency notification" AND "two year"	0	Not Useful
UO OneSearch/Education	"emergency notification" AND "two year college"	0	Not Useful
UO OneSearch/Education	"community college"	Top Results (60) ERIC (0) Education Abstracts (6,974) Academic Search Premier (23,587)	Not useful – Too much information
UO OneSearch/Education	"community college funding"	Top Results (31) ERIC (0) Education Abstracts (9) Academic Search Premier (26)	2 sources on funding challenges post Katrina
UO OneSearch/Education	community college challenges	Top Results (90) ERIC (1,592) Education Abstracts (410) Academic Search Premier (1,430)	Mostly not useful, one good source on funding challenges
UO OneSearch/Education	community college emergency	Top Results (82) ERIC (184) Education Abstracts (32) Academic Search Premier (784)	Not relevant

UO OneSearch/Education	"community college" AND emergency	Top Results (90) ERIC (1,592) Education Abstracts (410) Academic Search Premier (1,430)	1 Good source on CC's post Katrina
UO OneSearch/Education	"community college" AND disaster	Top Results (36) ERIC (39) Education Abstracts (2) Academic Search Premier (4)	1 Good sources on CC's post Katrina
UO OneSearch/Education	"mass notification"	Top Results (30) ERIC (0) Education Abstracts (UO Education 2) Academic Search Premier (35)	2 good sources Educause The Chronicle
UO OneSearch/Education	"community college mission" financing higher education	0	
UO OneSearch/Education	"community college mission" AND emergency	ERIC 4	Sources not relevant
Google Scholar (GS)	"mass notification"	331	1 Source poor but bibliographies are amazing
GS	"emergency notification" "community college"	78	1 Source ok but not great Little other peer reviewed material
GS	"community college" AND "emergency"	21500	Not useful – Too much information
GS	"emergency notification" AND "expensive"	635	Not useful – no peer reviewed in top five pages
Citeseer (CS)	community college emergency notification	9414	Too broad – refine
CS	"community college" "emergency notification"	0	Too narrow? Wasting time with new search engine
Educause.com	"emergency notification system"		Dedicated page for subject – 8 excellent sources

Chronicle.com	“emergency notification system”		3 additional Chronicle sources
UO OneSearch/Government Information	emergency notification	357	Results too broad and too oriented towards international events
UO OneSearch/Government Information	emergency notification AND education	2	Results are text to two emergency declarations
US Department of Education	emergency notification	1480	Results are broad but yield one source
UO OneSearch/General Search	emergency notification	Top Results (104) Academic Search Premier (249) JSTOR (2,848) Project Muse (99) UO Libraries' Catalog (47)	Results broad but yield two general sources
UO OneSearch/General Search	Mass notification	Top Results (91) Academic Search Premier (97) JSTOR (4,058) Project Muse (166) UO Libraries' Catalog (2)	Results broad but yield two general sources
National Center for Education Statistics	subject search: -Community college -Emergency notification system -Mass notification -Notification	2	Two Effective results of quantitative reports of statistical trends in community colleges

Appendix B

Coding Results Summary

Author	Concept or Word	Search Count	Notes	Relevant
Askin, J A., (2007)	Concept A			
	ENS	0		N
	Adoption	0		N
	Technologies	0		N
	Multimodal	0		N
	Concept B			
	Funding	42	p 977-996 Whole article focused on funding and how dual funded (state + local) better support CC mission of access and local needs while spending remains the same.	Y
	Access	5	p 994-996 Reduced dependence on state model based funding leads to reduced access	Y
	Mission	15	p 994-996 Discussion of singular funding model supporting multiple CC missions.	Y
Bambenek, J., & Klus, A. (2008)	Concept A			
	ENS	2	p 14 Use of SMS alerts at Oakland & St. Xavier University in emergencies.	Y
	Adoption	1	p 13 Quick mention of adoption process.	Y
	Technologies	73	p 12-16 Whole article focuses on SMS technology and its weaknesses as a notification tool.	Y
	Multimodal	0		N
	Concept B			
	Funding	0		N
	Access	0		N
	Mission	0		N
Chretien, W. (2008)	Concept A			
	ENS	29	Discusses various technologies, success with ENS deployments	Y
	Adoption	6	Mention of several schools enrollment rates & disappointments	Y
	Technologies	12	Mentions text, digital signage, IP phone, pager, sirens, and speakers.	Y
	Multimodal	4	Discusses need for multiple methods, buzz word “multimodal”	Y

	Concept B			
	Funding	0		N
	Access	0		N
	Mission	0		N
Fischer, K. & Wilson, R., (2007, September 7)	Concept A			
	ENS	2	Emergency Alert System called for at VA Tech by state report	Y
	Adoption	0		
	Technologies	1	Mention of Text (SMS) based technology	Y
	Multimodal	0		N
	Concept B			
	Funding	0		N
	Access	0		N
	Mission	0		N
Gnage et al. (2009)	Concept A			
	ENS	2	p 949-950 Talks about simple but effective ENS – pa system, email, & web.	Y
	Adoption	0		
	Technologies	4	p 950 Lists different technologies used at WVU: PA system, siren, web, e-mail, video.	Y
	Multimodal	2	p 949-950 Discusses layering of communication tools.	Y
	Concept B			
	Funding	0		N
	Access	0		N
	Mission	0		N
Halligan (2009)	Concept A			
	ENS	7	Use of systems to inform and secure campus, proactive thought in system, use of system at HFCC during murder/suicide	Y
	Adoption	0		N
	Technologies	4	Phone, email, digital signs, SMS	Y
	Multimodal	3	Mentions briefly use of multiple communication methods	Y
	Concept B			
	Funding	0		N
	Access	0		N
	Mission	0		N
Horn, L., & Li, X. (July, 2009)	Concept A			

	ENS	0		N
	Adoption	0		N
	Technologies	0		N
	Multimodal	0		N
	Concept B			
	Funding	0		N
	Access	2	p 1 Mentions economic access to college	Y
	Mission	34	p 5, 7-9 11-13 21 26 29-30 39 48 51 Presents variety of statistics, direction, demographical, aid, retention, completion, transfer, attrition, multivariate about reasons students attend, succeed, or not succeed at comm. College.	Y
			(Skipped Tables, Table Notes, & Appendices) Degree	
Horn, L., & Li, X. (Nov, 2009)	Concept A			
	ENS	0		N
	Adoption	0		N
	Technologies	0		N
	Multimodal	0		N
	Concept B			
	Funding	0		N
	Access	0		N
	Mission	15	p 1-5 14-15 Overview of study about populations and findings of subbachelor degree awards. Brief section on demographics related to awards.	Y
			(Skipped Tables & Table Notes)	
Mitroff, I. I., Diamond, M. A., & Alpaslan, C. M. (2006)	Concept A			
	ENS	5	p 64 67 Talks about emergency communication & alerting needs within the scope of emergency preparedness. (good background)	N
	Adoption	0		N
	Technologies	0		N
	Multimodal	0		N
	Concept B			
	Funding	0		N
	Access	0		N
	Mission	0		N
Molinski, S. (2008)	Concept A			

	ENS	8	p63-65 Discusses utilization of ENS during event at Saint Peter's College.	Y
	Adoption	0		
	Technologies	17	p63-65 Discusses utilization of ENS and other notification technology (e-mail, voicemail) during event at Saint Peter's College.	Y
	Multimodal	0		N
	Concept B			
	Funding	0		N
	Access	0		N
	Mission	0		N
Mullin, C. M., & Honeyman, D. S. (2008)	Concept A			
	ENS	0		N
	Adoption	0		N
	Technologies	0		N
	Multimodal	0		N
	Concept B			
	Funding	77	p 512-514 516-517 519-522 Overall discussion of funding formula usage, supporting statistics, governance, and implications due to FF use and funding decrease.	Y
	Access	0		N
	Mission	1	p 520 Mission based funding of comm. Colleges in Utah	Y
Page, C. (2008, October 16)	Concept A			
	ENS	3	p9 10 11 Overall look at popularity of ENS following VT	Y
	Adoption	0		
	Technologies	5	p8 9 10 13 14 Detailed examination of selected tools: GPS, BC Planning, LMS, Social Networking, Virtual Command Centers, Data Mining, etc.	Y
	Multimodal	0		N
	Concept B			
	Funding	0		N
	Access	0		N
	Mission	0		N
Reitano, J. R. (1990)	Concept A			
	ENS	0		N

	Adoption	0		N
	Technologies	0		N
	Multimodal	0		N
	Concept B			
	Funding	1	Mention of congressional authorization of funding forumula	Y
	Access	5	Discuss confusion of access, mission, and large population	Y
	Mission	27	Discussion of several missions, two year transfer, vocational, remedial. Examine whether focus is needed for the 21st C.	Y
Selingo, J. J. (2008, 12-February)	Concept A			
	ENS	3	Quick mention of ENS at multiple schools, Tulane, Princeton, Kent State. Looking at preparations for multiple events.	Y
	Adoption	4	Mention of low, opt-out, opt-in rates at schools in light of deployments	Y
	Technologies	3	Mention of failure of messaging technology.	Y
	Multimodal	0		N
	Concept B			
	Funding	0		N
	Access	0		N
	Mission	0		N
Shaffer, D. F. (2009)	Concept A			
	ENS	0		N
	Adoption	0		N
	Technologies	0		N
	Multimodal	0		N
	Concept B			
	Funding	0		N
	Access	1	Talks about one of the missions being an open enrollment “catch all” for non-traditional college students.	Y
	Mission	6	Outlines six missions for CCs and how they try to be all things to all people.	Y
Staman, M., Katsouros, M., & Hach, R. (2009)	Concept A			
	ENS	30	p49 50 52 54 56 Review and discussion of survey of deployed ENS solution, benefits, drawbacks, successes. Cites background and	Y

			specific cases from VT shooting, Univ of Iowa flood & tornado	
	Adoption	7	p50 52 60 Talk about subscription rates, what works, opt-in v. opt-out	Y
	Technologies	17	p 52 56 58 60 E-mail, web, phones, SMS, digital signage, projectors, e-message board, CATV. Includes survey results of deployed technology	Y
	Multimodal	6	p 52 54 56 58 60 Use of multiple systems at VT, consolidation into singular portal, same at Univ Iow without the portal, listed as lesson learned	Y
	Concept B			
	Funding	0		N
	Access	0		N
	Mission	0		N
Tollefson, T. (2009)	Concept A			
	ENS	0		N
	Adoption	0		N
	Technologies	0		N
	Multimodal	0		N
	Concept B			
	Funding	50	p387-401 Covers history of funding methods in many states, national trends, funding methods, external funds, increase of cost with mission, funding formula's rise, limitation of rising tuition, performance funding, adequacy of funding	Y
	Access	0		
	Mission	3	p394 Original CC Mission	Y
Violino, B. (2008)	Concept A			
	ENS	7	Talks about alert system at Butler County CC,Ivy Tech CC, & College of DuPage	Y
	Adoption	7	"Voluntary" subscribers at BCCC, Opt-In at Ivy Tech,Trouble with adoption at College of DuPage	Y
	Technologies	23	Focus on SMS, but Email, Phone, PDA, Web, D. Signage all mentioned	Y
	Multimodal	5	Consider need for multiple device/method support, use of multiple method support	Y
	Concept B			
	Funding	0		N
	Access	0		N
	Mission	0		N

Watson, L. M., Melancon, G., & Kinchen, N. (2008)	Concept A			
	ENS	0		N
	Adoption	0		N
	Technologies	0		N
	Multimodal	0		N
	Concept B			
	Funding	60	Article discusses state appropriations and reductions following Katrina & in America in general	Y
	Access	3	Discusses importance of regional access to education, massification	Y
	Mission	39	Discusses broad mission of CCs, specific focus on worker retraining in LA after Katrina	Y
Young, J. R. (Apr, 2008)	Concept A			
	ENS	1	Mention of ENS review post-VT	Y
	Adoption	1	Mention of phone # collection troubles with students.	Y
	Technologies	13	Discussion of various ENS tech (Sirens, Speakers, Signage, Text, E-Mail, Phone) and some limited talk of benefits/drawbacks.	Y
	Multimodal	5	Brief talk of using MM communications and not limiting to SMS.	Y
	Concept B			
	Funding	0		
	Access	0		
	Mission	0		
Young, J. R. (Feb, 2008)	Concept A			
	ENS	2	Mention of ENS setup at N. Ill. U.	Y
	Adoption	0		
	Technologies	5	Discussion of SMS drawbacks and setup of loudspeakers at VT and Wash. U.	Y
	Multimodal	1	Mention of MM usage at NIU (e-mail, voice, web)	Y
	Concept B			
	Funding	0		N
	Access	0		N
	Mission	0		N