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Communication Technology Within Community Colleges

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Communication Technology Within Community Colleges

A Dissertation by

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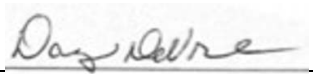

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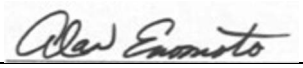

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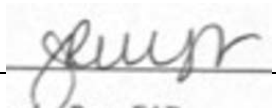

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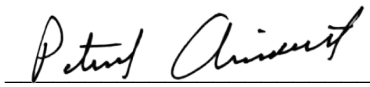

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August 2021

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To my family, with all my love. And with utmost gratitude to all who helped along the way.

ABSTRACT

Communication Technology Within Community Colleges

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Purpose: The purpose of this mixed methods study was to explore and describe the communication technologies that community college students perceive are effective ways to receive information from their college. A secondary purpose was to explore and describe communication technology channels students perceive would be effective ways to receive information from their college that are not being used.

Methodology: This mixed methods research design used quantitative and qualitative data to inform the research questions in relation to community college students' perception of communication technology effectiveness. The study was a sequential mixed methods study; the quantitative survey results helped to inform the semistructured questions for the qualitative focus groups. The survey link was sent to students attending the sample colleges. Students had the option to volunteer to participate in a virtual focus group, which followed the survey at both sample colleges. The sample included students who attended one of the study participant colleges and were 18 years of age or older.

Findings: The findings of this study indicate that community college students find communication channels currently in place to be effective overall. Students find email and text messages to be effective communication channels, but microblogs and social networking sites (SNS) are not effective. The research findings did not indicate students' preference for a communication channel that was not already being used at their colleges.

Conclusions: The study offers insight into community college student perceptions. Specifically, community college students are not dissatisfied with the existing

communication channels. Based on the literature and the findings of this study, email is still considered a standard for communication, but social media should be used for social purposes only.

Recommendations for Action: Colleges should not leave email behind any time soon, nor should they look for new communication technologies to solve communication challenges. Colleges need to create communication plans and should use social media wisely.

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CHAPTER I: INTRODUCTION

In 2009, President Barack Obama sought to improve the performance of community colleges by proposing a $12 billion improvement initiative (Bailey & Smith Jaggars, 2015). In 2015, he announced another proposal entitled America's College Promise, which sought to make the first 2 years of community college free to students (The White House: Office of the Press Secretary, 2015). Despite these efforts, America faces an education deficit. Community colleges are faced with budget deficits and reduced state funding (Bailey & Smith Jaggars, 2015) while the nation faces challenges brought on by globalization and an information technology revolution (Friedman & Mandelbaum, 2011). While facing budget deficits, community colleges are charged with providing education to 10 million students per year in the United States (Bailey & Smith Jaggars, 2015).

Such a large population of students choosing to enroll at community colleges may stem from the tradition of focusing on college access, offering the opportunity of higher education to underrepresented populations and the general public. Community college educational structure has remained open to allow all students access to a wide variety of different programs and avenues of study, referred to by Bailey and Smith Jaggars (2015) as the "cafeteria model" (p. 3). Now the focus is shifting from college access to the importance of student outcomes.

In addition to the importance of student outcomes, much attention is focused on the use of technology by colleges and students alike. Technology continues to advance at a rapid rate, and college students increasingly expect colleges to adopt new innovative applications (Bajt, 2011; Taylor & Steele, 2014). However, many colleges face

challenges associated with keeping up with students and their fast adoption rate of new technology. In order to meet the national and statewide demand for graduates, colleges should facilitate an evaluation of their communication to students to increase student success and student completion rates.

Background

American students' aspirations are high, with nearly every student claiming they want to attend college (Jenkins, 2009). In contrast, the graduation rate of higher education students in the United States is startlingly low, with only 9% of students receiving an associate's degree, and 31% receiving a bachelor's degree within 6 years of enrolling in college (Radford, Berkner, Wheeless, & Shepherd, 2010). College graduation rates have received interest on a national level over the last few decades, inspiring such actions as the creation of the U.S. Department of Education's College Navigator website (Bailey & Smith Jaggars, 2015) and proposals by President Barack Obama for increased funding (Bailey & Smith Jaggars, 2015) as well as new programs such as the America's College Promise (Oakley, 2017).

Perhaps in response to national graduation rates, organizations are also seeking to increase the completion rates among students. For example, Achieving the Dream was created in 2004 by the Lumina Foundation and several partners as a national initiative seeking to increase student success in community colleges (Achieving the Dream, 2017) while some authors, such as Bailey and Smith Jaggars (2015), called for a complete overhaul of the community college design to increase completion rates.

College Graduation: California's Community Colleges

Community colleges serve more than 10 million students per year in the United States (Bailey & Smith Jaggars, 2015). More than one fifth of those students are served in California, which houses the largest community college system in the United States, serving more than 2.1 million students per year (California Community Colleges Chancellor's Office, 2021b). The California Community Colleges system, comprising 116 colleges, 72 centers, and 73 districts (California Community Colleges Chancellor's Office, 2021b) awarded more than 220,000 certificates and degrees for 2015-2016 systemwide, up from 156,000 in 2011-2012 (Oakley, 2017). Credit course success rates have seen an increase as well, moving from an average of 66% course success in 2005 to 71% in 2015-2016 (Oakley, 2017). Despite these improvements, the longitudinal data have not yet improved, mirroring the national average; only 47% of students who entered a California community college seeking a certificate, degree, or transfer in 2009-2010 had met their goal by 2014-2015, or within 6 years of entering college (California Community Colleges Chancellor's Office, n.d.-a).

Communication Technologies Within Higher Education

The proliferation of the Internet, an increase in online communication, and advancements in communication technology have changed the way that individuals communicate (Ferreira, Klein, Freitas, & Schlemmer, 2013; Ha & Dong Hee, 2014; Pirani & Sheehan, 2009). Virtually every aspect of people's lives, including how they communicate with one another, the workplace, and all levels of education are affected by technology (Guri-Rozenblit, 2009). Mobile technologies increase people's effectiveness

both in the workplace and with students, allowing educators new options to connect and interact with colleagues and students (L. A. Wankel & Blessinger, 2013).

Studies show that student learning can be enhanced by the use of new technology (Booth & Esposito, 2011; Ferreira et al., 2013; Ha & Dong Hee, 2014; Vázquez-Cano, 2014; L. A. Wankel & Blessinger, 2013). Technological innovations within the realm of education, such as social networking sites, are transforming and enhancing how students and faculty connect (L. A. Wankel & Blessinger, 2013). These technological innovations have enabled higher education institutions to adopt the use of apps (Lum, 2012; Vázquez-Cano, 2014) and social media (Booth & Esposito, 2011; C. Wankel & Wankel, 2011) to connect with students.

Social media. Many facets of college life now include social media, including mentoring (Booth & Esposito, 2011), college social integration (McEwan, 2011) and intercollegiate athletics (K. Weaver, 2011). The use of social media sites, such as Facebook, allow college employees to engage with students (Booth & Esposito, 2011) and for students to feel supported by staff and fellow students (McEwan, 2011). Some students, however, prefer to keep social media for less formal areas of their life rather than as a tool for extended classroom activities (Ha & Dong Hee, 2014; Waycott, Bennett, Kennedy, Dalgarno, & Gray, 2010).

Social networking sites (SNS). SNS are the most popular type of social media (Junco, 2014; Zappavigna, 2012). SNS, such as Facebook and MySpace, allow their users to greatly customize their experience (A. C. Weaver & Morrison, 2008) including the ability to create their own profiles (A. C. Weaver & Morrison, 2008; Zappavigna,

2012). These SNS allow both faculty and students to connect in a digital space (Blumenstyk, 2015).

Email. Email, although not new, is a common way for people to exchange messages electronically (The Radicati Group, 2017). Email is frequently used on college campuses (Lancaster, Yen, Huang, & Shin-Yuan, 2007) by students, faculty, and staff. Today, there are a myriad of companies that provide email service (The Radicati Group, 2017), in addition to the many colleges and universities that provide email service to their students.

Microblogs. Microblogs are similar to blogs, allowing short snippets of information or images to be published online. Some of the most well-known microblogging services are Twitter, Instagram, and Snapchat. These microblogging services are quite popular, especially with college-age individuals (Smith & Anderson, 2018).

Instant messaging. Instant messaging allows individuals to instantly message other users (Junco & Timm, 2008) through both smartphones and computers. Instant message content often includes the use of emoticons (Safko & Brake, 2009). An example of a popular instant messaging application is WhatsApp (Smith & Anderson, 2018).

Smartphones and mobile devices. Mobile technologies are increasing in popularity, allowing students to learn virtually at any time or place (Ferreira et al., 2013; Vázquez-Cano, 2014; L. A. Wankel & Blessinger, 2013) and encouraging institutions around the world to implement mobile learning (Vázquez-Cano, 2014). Mobile technologies are useful for educational purposes not only for learning but also for student

engagement and retention (L. A. Wankel & Blessinger, 2013), and colleges are generally either fully immersed or struggling to find where they should start first (Lum, 2012).

Challenges of Technology Within Higher Education

According to L. A. Wankel and Blessinger (2013), educational institutions should be responsible for preparing students to live in a more interconnected world that is still evolving, and Vázquez-Cano (2014) emphasized the need for students to master a level of technical competence in order to be successful in life. Udochukwu Njoku (2015) offered the position that regardless of industry, an education must adequately equip people, and Sevillano-García and Vázquez-Cano (2015) promoted the attainment of transferable skills in accordance with societal demands.

Whether responsible for student technology attainment or not, and while faced with growing enrollments and funding declines common among colleges, it is important for colleges to be innovative (Herndon, 2011). Although colleges may perceive technology to be expensive, some technologies can be utilized toward providing new revenue stream opportunities as well (K. Weaver, 2011), which may even cover the cost of implementation or maintenance. Responsiveness to the changes being demanded by students, coupled with the need for institutional success, is driving these organizational changes (Guri-Rozenblit, 2009).

As technology advances, it is fast becoming a potentially unrealistic goal for colleges to keep up with the rate of technological change (Annan-Coultas, 2012). Many higher education institutions are ill or underprepared to handle the growing demand, such as making mobile services available (Lum, 2012; Pirani & Sheehan, 2009), and college staff may be "behind the curve in their use of technology" (Junco & Timm, 2008, p. 1).

As new technologies are developed, students often adopt them before other college constituencies (Annan-Coultas, 2012), such as staff and administrators, further widening the gap between institutions and their constituents.

Technological expectations of students. The average student beginning college today has never experienced a time without the presence of personal computers (Junco & Timm, 2008). Smartphones and other smart devices are used daily by millions of higher education students (Emanuel, 2013; Ferreira et al., 2013), many of whom do not turn their devices off (Emanuel, 2013) and use more than one device at a time (K. Weaver, 2011).

Consumers in general are experiencing self-service technologies in many realms, and especially online (Herndon, 2011; Kowalik, 2011) through experiences such as online ordering or by using travel booking websites. Students are not exempt from this phenomenon, demonstrating a desire for more resources to be available in new formats, such as mobile (Vázquez-Cano, 2014) and instant messaging (Salas & Alexander, 2008). Along with self-service in other areas, students hold the expectation that colleges will respond to them quickly (Junco & Timm, 2008; Salas & Alexander, 2008).

Students desire to see more resources made available via smartphones, not only to enhance learning but for wraparound services as well (Lum, 2012; Vázquez-Cano, 2014). Studies show that students want information such as that which could be provided from university administration (Vázquez-Cano, 2014) regarding bus schedules, food menus, and the ability to conduct transactions like registering for classes (Lum, 2012).

There is a need to increase college graduation and completion rates within the United States (Bailey & Smith Jaggars, 2015). Advancements in communication

technologies have opened the door for the use of multiple communication platforms by higher education institutions, and now institutions must learn how to manage their options (Junco & Timm, 2008). To serve and more fully engage college students, it is important to understand students' use of technology (Junco & Timm, 2008).

Classroom disruption. Whether adopted primarily by staff or students, not all technological innovations are well received by educational instructors because students frequently use technological devices for off-task activities during class time (Annan-Coultas, 2012; Cheong, Shuter, & Suwinyattichaiporn, 2016). Faculty-driven need to maintain classroom authority has led to extremes, even sabotaging electronic devices in class to set an example (Cheong et al., 2016). To maintain classroom authority, one study found several broad themes used by instructional faculty: the implementation of a policy or set of rules, the use of redirection, the enforcement of consequences, and the practice of deflection (Cheong et al., 2016).

Among instructor concerns are effects to student learning (Ledbetter & Finn, 2016), loss of class time due to digital distractions (Cheong et al., 2016), and the inability for instructors to keep up with new technologies (Annan-Coultas, 2012). Perhaps a factor increasing instructors' concern and discomfiture in relation to their classroom authority is the desire held by many students for their instructors to engage them (Prensky, 2005). Other factors include the difficulty in discovering digital distractions, which may be masked or disguised by classroom activities or otherwise authorized behavior, an unwillingness to use class time for discipline regarding digital distractions, and physical difficulties within the classroom itself (Cheong et al., 2016).

Also frequently found within the classroom-distraction debate is student laptop use, which can provide legitimate learning assistance, such as note taking and access to the Internet, and yet can also cause distractions, such as web surfing and technical issues (Annan-Coultas, 2012). Student perspectives include different approaches to help decrease distractions, such as banning devices, removing Internet access, restricting or monitoring access—as well as feeling a sense of ownership—that it is their own personal responsibility to monitor their level of distraction (Annan-Coultas, 2012). Most college students admit to texting in class occasionally, checking their phone during class, and attempting to hide or disguise the use of their phone (Emanuel, 2013).

Statement of the Research Problem

Colleges communicate deadlines, policies, and other important campus information to students through a variety of methods including websites, mobile apps, email, text messages, and social media. Despite colleges' intent to reach their students, many students do not receive the communication or may not understand it as evidenced by student persistence and completion rates (Bailey & Smith Jaggars, 2015; Oakley, 2017). Students may struggle to navigate college pathways and ultimately not succeed toward their goal without quality communication with their higher education institution.

Studies on communication between colleges and their students have found several factors that influence the effectiveness of communication. Some authors believe that there is, or at least has been, a digital divide between students and college employees (Prensky, 2009) although others oppose the idea of a digital divide (Margaryan, Littlejohn, & Vojt, 2011). The rate at which students and institutions adopt new technologies often differs greatly (Rogers, 1983, 2003). In addition, there may be

disparities in the use of technologies between different student population groups, including differences in age, ethnicity, and socioeconomic status (Perna, 2014).

Some authors believe that colleges fail to use an acceptable type of technology to communicate with their students or that they may need to reevaluate the manner in which the communication is used or for what purpose (Annan-Coultas, 2012; Ha & Dong Hee, 2014; Taylor & Steele, 2014; Waycott et al., 2010). Technology may be viewed as a valuable communication tool to deliver information, but students must also feel engaged for any communication method to be successful (Booth & Esposito, 2011; Prensky, 2005; Tierney, 2014). Other authors outline communication as a possibly limiting factor to student success, seen as a smaller piece of a larger need to rethink college organizational structure as a whole (Bailey & Smith Jaggars, 2015; Tierney, 2014).

Different types of communication technologies have been heralded as what colleges should adopt. Reasons to adopt specific technologies are often due to budget constraints (Castleman & Page, 2016; Herndon, 2011) or the ease of college implementation and use (Castleman & Page, 2016). New technologies may be supported because they allow employees to complete their work more easily or efficiently (Stanaityte, Washington, Wankel, & Blessinger, 2013). However, few studies have explored which particular technologies students may want implemented at their college. A few studies include collecting data of specific technology use by students, generally with a specific scope of whether or not students prefer a specific technology delivery method for a specific task, such as Facebook for classroom instruction (Ha & Dong Hee, 2014).

The continuing rise in the number of communication technologies available and the widespread adoption of new technology by students encourage colleges to be innovative in their technology adoption procedures. Colleges should meet students within a mutual technological framework to best facilitate communication. To stay abreast of what students' needs are, colleges should continually assess their students' communication needs, interests, and technology adoption trends (Junco & Timm, 2008; Taylor & Steele, 2014). Ultimately, colleges need to learn how students choose to use technology and how it affects their lives to increase student success (Junco & Timm, 2008).

Purpose Statement

The purpose of this mixed methods study was to explore and describe the communication technologies that community college students perceive are effective ways to receive information from their college. A secondary purpose was to explore and describe communication technology channels students perceive would be effective ways to receive information from their college that are not being used.

Research Questions

1. How do community college students perceive the effectiveness of their community college's technology channels in place for receiving information from the college?
2. Do community college students prefer the use of technology channels for communication that are not used by their college?

Significance of the Problem

College completion rates in the United States are low, with only 9% of students receiving an associate's degree and 31% of students receiving a bachelor's degree within

6 years of enrolling in college (Radford et al., 2010). In California, only 47% of students who entered a California community college seeking a certificate, degree, or transfer in 2009-2010 had met their goal by 2014-2015, or within 6 years of entering college (California Community Colleges Chancellor's Office, n.d.-a). Programs designed to increase completion rates have begun to try to increase student success (California Community Colleges Chancellor's Office, 2012; Jenkins, 2009). A portion of student success lies within the student's engagement and communication with the college they attend. Colleges have turned to new communication technologies to engage with their students (Booth & Esposito, 2011; Ferreira et al., 2013).

Many studies have explored the use of new technologies within the classroom as an instructional tool to enhance learning (Annan-Coultas, 2012; Booth & Esposito, 2011; Ha & Dong Hee, 2014). New forms of learning within the mobile space have emerged, such as m-learning (Ferreira et al., 2013; Vázquez-Cano, 2014). Some studies have highlighted how communication technologies, such as social media, may be used within student life (K. Weaver, 2011) and during campus emergencies (Pirani & Sheehan, 2009). Few studies have examined the use of communication technologies for student services areas (Herndon, 2011). In addition, few studies have been found that demonstrate how colleges can stay abreast of the increasing rate of technology adoption by students or how to continually capture the student perceptions, needs, and interests in regard to technology.

With the rapid increase of differing communication technologies available for implementation, it is important for colleges to understand student adoption, perceptions, and usage of new technology (Junco & Timm, 2008). This study will help student

services professionals learn about students' communication technology use. Studying student user technology trends will inform student services personnel about the student user expectations of communication technologies (Junco & Timm, 2008). In addition, by identifying student user data trends, college personnel will be able to determine whether their communication is having an impact on students. Studying the impact of college communication on students will help college professionals to evaluate the use of the particular communication technologies at their institutions in order to adopt, modify, or discontinue current practices.

Ensuring that valuable communication occurs between college students and the institution they attend is a challenging task for college personnel, particularly for those whose avenues of communication lie outside of face-to-face interaction. Information is sent to students through various communication methods such as through the college website, via email or text messages, mobile apps, and social media. Students require clear communication from their colleges through these channels to navigate the myriad of college offerings and services. An increase in students' knowledge of services available will increase student success. By increasing student success and engagement college retention rates will increase, which will in turn increase college completion rates. Student success and student engagement are needed if America's college completion rates are going to increase.

Definitions

The following section lists definitions of terms found within the study.

Theoretical Definitions

Media richness theory. A framework by which organizations may determine whether communication tools are considered either rich or lean (Daft & Lengel, 1986) based on the amount of content information that is sent and transferred (Lu, Kim, Dou, & Kumar, 2014).

Operational Definitions

California community college. One of the 116 community colleges within California, which may provide training for the workforce, English and math courses, and certificate and degree programs as well as preparation for transfer to 4-year higher education institutions (California Community Colleges Chancellor's Office, 2021b).

Community college student. A student who attends a community college within the California Community Colleges system.

Communication technology. Tools of a technological or electronic nature that reduce the need for physical presence to communicate (Baym, 2015; Junco & Timm, 2008).

Delimitations

This study was delimited to include students attending California community colleges located within the California Association of Community College Registrars and Admissions Officers Region 4 during the 2020-2021 school year.

Organization of the Study

The remaining portions of this study are organized into four chapters, a reference list, and appendices. Chapter II presents a review of the literature including a review of communication technology changes to society, implications for colleges specifically, and overall emerging trends for addressing student needs. Chapter III outlines the research design and methodology of the study. Chapter IV presents the results of the study. Chapter V includes findings, conclusions, and recommendations for further study. The reference list contains all works cited in this study. The appendices include items important to the study when formatting required placement outside the body of text.

CHAPTER II: REVIEW OF THE LITERATURE

Higher education is under scrutiny within the United States across several fronts, including low graduation rates (Bailey & Smith Jaggars, 2015; Radford et al., 2010) and increasing costs to students and their families (Blumenstyk, 2015; Phelan, 2016), causing colleges and universities to seek pathways of improvement for all stakeholders. At the same time, the use of electronic media is increasing at a rapid rate, presenting opportunities and challenges for organizations within higher education (Amirault, 2015; Junco, 2014; Phelan, 2016). Students adopt communication technologies at a fast rate and expect higher education to be available to them through the channels of their choosing (Ferreira et al., 2013; Lum, 2012; Ramage, 2011). Colleges must research student communication technology preferences to keep abreast of student expectations and thereby increase student success.

A review of the literature was performed to gather context for this study, and the researcher developed a literature matrix (see Appendix A). This literature review is organized into several parts. Part one outlines the current state of higher education, both broadly and specifically within community colleges in California. The second part of this literature review details different communication technologies available today, many of which are used within the realm of higher education. Part three details the challenges of different communication technologies within the arena of higher education. The subsequent part discusses communication within higher education, culminating with an introduction to media richness theory as a framework for this study. The final part defines a gap in the literature, which is the basis for this study.

State of Higher Education

President Barack Obama has stated that "every American, whether they're young or just young at heart, should be able to earn the skills and education necessary to compete and win in the 21st century economy" (Oakley, 2017, p. 7). As evidence of his support of higher education, in 2009 Obama proposed a $12 billion initiative to improve higher education (Bailey & Smith Jaggars, 2015). Obama also proposed implementing a system of rating colleges based on their outcomes, which could incentivize students with higher monetary assistance awarded to students who chose to attend higher rated colleges (Bailey & Smith Jaggars, 2015). Subsequently, Obama declared the need to increase the number of higher education graduates to a level that would place America in the worldwide lead by 2020 (Phelan, 2016) and unveiled the America's College Promise proposal in 2015, intended to make the first 2 years of community college free to students (The White House: Office of the Press Secretary, 2015).

President Obama is not alone in his recognition of the need to give higher education a vigorous push as many distinguished organizations also seek to improve higher education in America. The Lumina Foundation launched Achieving the Dream: Community Colleges Count in 2004 seeking to increase institutional outcomes and student degree completion (Bailey & Smith Jaggars, 2015). The Bill and Melinda Gates Foundation announced in 2008 a desire to double the number of students from low-income backgrounds who earn a bachelor's degree by the year 2025 (Phelan, 2016). The New American Foundation seeks to increase graduation rates by 50% by 2025, and the Lumina Foundation envisions a higher education credential in the possession of 60% of all Americans by the year 2025 (Phelan, 2016). Other foundations have added to higher

education reform efforts as well, including the Kresge Foundation, the James Irvine Foundation, and the William and Flora Hewlett Foundation (Bailey & Smith Jaggars, 2015).

Many of these organizations are calling for massive change, rather than incremental change, to meet their set goals (Phelan, 2016). The underlying impetus of these institutional goals is the need to improve the state of higher education in America as the country faces an education deficit. Colleges and universities face a myriad of challenges while the nation itself faces challenges brought on by globalization and an information technology revolution (Friedman & Mandelbaum, 2011).

Scrutiny of America's higher education systems has increased in recent years. Almost all students claim they want to attend college (Jenkins, 2009), yet many students never complete college (Bailey & Smith Jaggars, 2015; Radford et al., 2010). The graduation rate of higher education students in the United States is low, with only 9% of students receiving an associate's degree and 31% receiving a bachelor's degree within 6 years of enrolling in college (Radford et al., 2010). Graduation rates of this type have received interest at a national level by many private change-seeking organizations and by public policymakers, such as those who created the U.S. Department of Education's College Navigator website (Bailey & Smith Jaggars, 2015).

Colleges and universities face public outcry because of low student success rates, minimal outcomes, and the rising cost of attendance (Phelan, 2016). The realization that the average person needs a college education to find sufficient employment to support a family has become widespread, coupled with the concern that not all college educations are of sufficient quality and may be outside the financial reach of an average family to

obtain (Bailey & Smith Jaggars, 2015; Blumenstyk, 2015). A college degree is viewed as an economic necessity versus an opportunity, much like a high school diploma once was viewed (Bailey & Smith Jaggars, 2015).

Within the higher education realm of America, change and innovation are desperately needed for reform; as public scrutiny has increased at the same time, challenges for educational institutions have also increased (Phelan, 2016), combining into a storm from which colleges may only hope to emerge unscathed. Colleges are struggling with increased accountability, fiscal downturns, political pressures, and public mandates for change (Bailey & Smith Jaggars, 2015; Nevarez, Wood, & Penrose, 2013; Phelan, 2016), with increasing demands for transparency and innovation (Phelan, 2016). While grappling with these challenges, colleges are charged with a heavy and diverse load of expectations to serve their communities: increase the diversity of the students who choose to attend, encourage workforce training and economic development, increase transfer and degree completion rates within reasonable time frames, increase the level of support for students while in attendance, and attempt to decrease the cost of attendance (Nevarez et al., 2013; Phelan, 2016). Hurdles to overcoming these challenges include institutional resistance to change (Phelan, 2016; Rowley, Lujan, & Dolence, 1997; K. Weaver, 2011), an increasingly diversified student body, and the threat of decreased funding at the federal, state, and local level for failure to meet new standards (Phelan, 2016).

Community Colleges in America

Community colleges were at one time a disruptive innovation to the higher education panorama in America, designed to allow larger populations of students access

to higher education (Phelan, 2016). In the beginning, their mission was to provide transfer education, career education, and community service while surveying and responding to the needs and demands of their local communities (Phelan, 2016). Today, community colleges provide educational opportunities to more than 10 million students a year, nearly half of all the undergraduate students in the United States (Bailey & Smith Jaggars, 2015; Blumenstyk, 2015; Phelan, 2016) and more than half of undergraduates who are first-generation college students (Phelan, 2016). Community colleges have expanded in some cases to offer 4-year degrees in addition to 2-year degrees and certificates (Blumenstyk, 2015).

Community colleges are not exempt from the external pressures shaping American higher education. They too are facing pressure to change under increased scrutiny, accountability, and economic stressors (Nevarez et al., 2013). Higher education in general is highly competitive, and unlike some universities, community colleges cannot rely on past successes or reputations but rather are measured on an ongoing basis through categories such as the quality of the institution and the service the college provides to its constituents (Phelan, 2016).

Monetary support for community colleges may be different than the models universities experience as well. Community colleges are unique institutions of higher education; they are able to exist on smaller budgets than larger institutions yet serve the most financially needy and least academically prepared students, spending less per student than 4-year institutions (Blumenstyk, 2015). Community college funding is commonly tied to performance outcomes, such as the rate of transfer or degree completion, how particular student populations succeed or progress through the

institution, the employability of graduates after leaving the institution, and operational expenses (Phelan, 2016). Funding sources may include state legislatures, national and state grants, and private sources such as alumni and public donors. For the majority of community colleges, funding depends on public support, which creates a challenge for the agencies that disperse public funds to strike a balance between differing community needs (Bartkovich, 2011), often increasing public scrutiny of college funds. Overall, community colleges in the United States have experienced a decline in revenue. Budgets that have been reduced during economic downturns are not often restored, which has resulted in a long-term downward trend in state funding (Bailey & Smith Jaggars, 2015).

Community colleges often face additional challenges, separate from those of 4-year institutions by the very nature of their unique design. One of these challenges includes the student populations they serve as community college students often come from disadvantaged backgrounds, and student populations often consist of students from minority groups (Blumenstyk, 2015). Community colleges tend to be open-access, allowing any member of their community to attend, which can often result in a disproportionate number of students attending while facing challenges of an academic, social, and economic nature (Bailey & Smith Jaggars, 2015), who may not have chosen to attend if not for the open-access. At the community college level, students may apply months in advance or as classes are beginning (Bailey & Smith Jaggars, 2015; Safier, 2015). Without a more formalized application cycle, some students may be well prepared to enter college and some may be ill prepared with little time to adjust (Bailey & Smith Jaggars, 2015).

California Community Colleges

Designed around the concept of providing higher education to all, the California Community Colleges system is the most open and accessible in the world (Fried, Esch, & Supinger, 2017). The California Community Colleges system is also the largest in the United States, serving 2.1 million students per year (California Community Colleges Chancellor's Office, 2017b), more than twice the combined number of students served by the California State University system, 465,686 (California State University Budget Office, 2016), and the University of California system, 210,170 (University of California Infocenter, 2016). The California Community Colleges system serves so many students that one in five of all American college students who attend a community college do so at a California community college (National Center for Education Statistics, 2016). As a state, California has 3% more students who attend college than other states (Legislative Analyst's Office, 2016).

The University of California and California State University systems often accept only a small percentage of students of a high caliber, but the California Community Colleges accept all students, referring to the student body as the "top 100 percent" (Fried et al., 2017, p. 8). California's community colleges have a diverse student body, many of whom come from challenging or disadvantaged backgrounds. In 2015-2016, 42.5% of students identified as Hispanic, 27.4% as White, 6.4% as African American, 11.6% as Asian, 3.2% as Filipino/Pacific Islander, and 3.7% as multiethnic (Fried et al., 2017). Students also demonstrate diversity in age as only one quarter of students are fresh out of high school, nearly one third are between the ages of 20 and 24 (California Community Colleges Chancellor's Office, 2017a), and more than 40% of students are over the age of

25 (Fried et al., 2017). Close to 8% of California Community Colleges students are immigrants (California Community Colleges Chancellor's Office, 2017c), and almost half of the veterans using GI benefits in California do so at a California community college (Foundation for California Community Colleges, n.d.). Their college experience varies too as 25% of students are attending college for the first time, and 11% are returning to college after having been away for one or more terms (California Community Colleges Chancellor's Office, n.d.-b). In 2016, more than 40% of students were the first to attend college in their family (California Community Colleges Chancellor's Office, 2017a).

California's broad higher education system is unique from other states in that it relies heavily on the community colleges and is specifically designed for degree-seeking students to begin their journey at community college (Fried et al., 2017). In fact, more than half of California State University graduates and almost a third of University of California graduates began at a California community college (Community College League of California, 2015). The national average for higher education students to attend a community college is 46%, but in California the rate is 60% (Legislative Analyst's Office, 2016).

An additional way in which California differs from other states in regard to community colleges is the cost of tuition. California community college fees are the lowest in the United States (Ma & Baum, 2016), and only 52% of students pay fees (California Community Colleges Chancellor's Office, 2016). The remaining students do not pay fees as their fees are waived by the Board of Governors fee waiver for low income students (Fried et al., 2017). The low cost of tuition at California community

colleges makes them a popular choice for low-income Californians (Fried et al., 2017) and their families.

The initial mission of the California Community Colleges system was to provide access to higher education for millions of Californians, and it continues to do so for more than 2.1 million students per year (California Community Colleges Chancellor's Office, 2021b). However, many of those students do not reach their educational goals, demonstrating the same completion rates as those found across the nation. In 2015-2016, the system awarded more than 220,000 certificates and degrees, an increase from 156,000 certificates and degrees in 2011-2012 (Oakley, 2017). Yet only 47% of students who entered a California community college seeking a certificate, degree, or transfer in 2009-2010 had met their goal by 2014-2015 or within 6 years of beginning college (California Community Colleges Chancellor's Office, n.d.-a). Part-time students may experience even worse outcomes because students who took fewer than 6 units or who did not complete math or English within their first 3 years are not represented in the data (Fried et al., 2017). For students who earned an associate's degree, the average time to do so was 5.2 years (Fried et al., 2017).

The success of community college students in California is important to the very success of the state itself (Fried et al., 2017) as the "most powerful engines of social and economic progress in the state" (Oakley, 2017, p. 4), and California is facing a shortfall. The California Community Colleges Chancellor's Office projects a gap of one million middle-skill workers, those with certificates or associate degrees, and 1.1 million workers with bachelor's degrees (Oakley, 2017). To be among the top 10 states for educational achievement in the Unites States in 2025, California would need to award more than 2.4

million degrees and certificates (California Competes, 2015). For California to be internationally competitive, the Lumina Foundation estimates by the year 2025 there would need to be 3.7 million associate's and bachelor's degrees awarded (California Competes, 2012), and the Public Policy Institute of California estimates there will be gap of 1.1 million bachelor's degrees alone by the year 2030 (H. Johnson, Cuellar Mejia, & Bohn, 2015).

Student success rates are low, and the time it takes a student to graduate is long. The public is clamoring for reasons why students are taking so long to reach their goals. One reason why college may be difficult for students to navigate is the confusion over the high volume of options in programs, transfer pathways, and careers (Bailey & Smith Jaggars, 2015). And if students cannot see a clear pathway, the idea of completing college can seem insurmountable (Fried et al., 2017). As at the national level, the volatile funding process of the California Community Colleges has driven expansion during prosperous times and reductions during recessions, leading to extensive collections of courses for students that may not match their needs or the needs of California (Fried et al., 2017). This extensive array of classes can often seem overwhelming to students (Bailey & Smith Jaggars, 2015; Fried et al., 2017) leaving them confused or stranded.

The California Community Colleges Chancellor's Office took a proactive approach in 2017 with the release of the Chancellor's Vision for Success, detailing steps the Chancellor's Office and the colleges within the system should take to improve success rates for California community college students (Fried et al., 2017). Highlighted within the document were seven core commitments for the whole system to focus on to improve student success, one of which was to "always design and decide with the student

in mind" (Fried et al., 2017, p. 19). The authors expanded on this idea to include the need for campus stakeholders to keep the student experience in mind when making decisions regarding the design and delivery of student services. This suggests that, as digital conveniences have made people's lives easier in general, students must be able to receive the same service with electronic access to the California Community Colleges system and its colleges with the ability to access what they need regardless of physical location or time of day (Fried et al., 2017). Also highlighted was the need to ensure that the communication and support that students receive are consistent regardless of their entrance into community college, for which the Chancellor's Office plans to review its entire education technology portfolio (Fried et al., 2017).

Communication Technologies Within Higher Education

One of the challenges facing colleges today is communication between the institutions and their students. Communication technology has advanced at an enormous rate, and many colleges are scrambling to catch up. In general, how people communicate has been drastically modified by the advent of numerous technological communication tools in the last century (Ferreira et al., 2013; Ha & Dong Hee, 2014; Pirani & Sheehan, 2009). Virtually every aspect of people's lives, including how they communicate with one another, the workplace, and all levels of education are affected by technology (Guri-Rozenblit, 2009). Today, there were more ways in which to communicate with one another than there had ever been before, changing how people connect to one another (Baym, 2015). Where once physical presence was required, now communication spans great distances and at great speeds, forever changing human social interactions (Baym, 2015; Hirsch & Weber, 1999; Junco, 2014). The following section offers a review of

some of the most common technological communication tools available with applications within higher education.

Social Media

Social media is now one of the most prevalent communication tools in the modern day (Jacquemin, Smelser, & Bernot, 2014). Social media, rather than one product, may be defined in different ways: as web-based or mobile tools that help to facilitate communication (Tierney, 2014) and as applications, or indeed whole systems, that allow users the ability to create, combine, and share content (Junco, 2014). Some of the most common social media tools include email, instant messaging, microblogs (Tierney, 2014), and social networking sites (SNS; Junco, 2014). The basis of social media is to conduct two-way communication between parties (Safko & Brake, 2009) or groups and one-way communication of information such as simply posting information about events (Junco, 2014), akin to mass media communication. Each form of social media has a unique place in society today with benefits and challenges for each.

Social media in a college setting. Social media is extremely popular with college students (Junco, 2014), and many facets of college life, such as mentoring (Booth & Esposito, 2011), college social integration (McEwan, 2011), and intercollegiate athletics (K. Weaver, 2011), now include social media. The use of social media sites allows college employees to engage with students (Booth & Esposito, 2011) and colleagues (Bajt, 2011), and in turn, students feel supported by staff and their fellow students (McEwan, 2011). Staff, such as academic advisors, who regularly engage students, have found social media help them with their work with students (Booth & Esposito, 2011) by meeting them in the digital space. One of the reasons college leaders

find social media attractive is that it allows their institutions to engage in two-way communication with students (Boggs & McPhail, 2016) regardless of time or space, increasing their perceived reach.

Some students prefer to keep social media for less formal areas of their life rather than as a tool for extended classroom activities (Ha & Dong Hee, 2014; Waycott et al., 2010). Nevertheless, little doubt remains that social media has been fully incorporated into different areas of the college experience. An area of campus life that has seen exponential growth within the social media scene is intercollegiate athletics (K. Weaver, 2011), especially as teams and fans connect and coaches and colleges seek donations. Typical college students use social media to connect as well. According to the Pew Research Center, nearly 90% of 18- to 29-year-olds do not discriminate in their use of social media (Smith & Anderson, 2018), incorporating any form of social media they desire.

Social Networking Sites (SNS)

Although social media takes many different forms, the most popular type of social media is SNS (Junco, 2014; Zappavigna, 2012). SNS are web applications that allow their users to create profiles, create and control site content, and manage sharing permissions to connect with one another (A. C. Weaver & Morrison, 2008; Zappavigna, 2012) extending their face-to-face relationships (Booth & Esposito, 2011) into the digital realm. One of the reasons for the popularity of SNS is the ability of users to be able to customize their experience (A. C. Weaver & Morrison, 2008). Another reason is their unique ability to combine multiple modes of communication into one platform (Baym,

2015). The popularity of SNS has grown exponentially with millions of users around the world (Safko & Brake, 2009).

Facebook and MySpace are the most popular type of SNS (Junco, 2014). MySpace was launched in 2003, and Facebook followed suit when it was launched to the public 2 years later in 2005 (Baym, 2015). Although initially created in 2003, MySpace was relaunched in 2013 (MySpace, 2014) to try to maintain its popularity in the face of other rising SNS. Today, most Americans favor Facebook as their social media of choice (Smith & Anderson, 2018). Facebook was initially created in 2004 for particular college populations before it was later made available to the general public (Junco, 2014; Safko & Brake, 2009). Facebook became a publicly traded company in 2014 and soon after had achieved more than 900 million users (Tierney, 2014). SNS such as MySpace and Facebook are not restricted to friends and family for social use; many businesses and organizations use them to promote their focus as well, including political ad campaigns (Safko & Brake, 2009).

Social Networking Sites (SNS) in a college setting. Through the advancement of communication technologies, increasingly networked campuses, and the onslaught of mainstream mobile devices, students are perceived to almost constantly be connected to their social networks (Robinson & Stubberud, 2012). For college students within the United States, Facebook is the most popular SNS (Junco, 2014), which may not be surprising given that it was created by a college sophomore at Harvard for use within the college environment (Junco, 2014; Safko & Brake, 2009).

SNS continue to transform and enhance how students connect with faculty (L. A. Wankel & Blessinger, 2013) and support staff (Junco, 2014) as part of the college

experience. Student services professionals may engage with students who may be most comfortable asking for help in an online space. Some college service departments, such as financial aid, offer social networking site pages as a way to meet students where they are comfortable to increase the feasibility of reaching their office and allowing them the opportunity to engage with students about financial literacy and the department itself (Junco, 2014). Social media can be key for other areas of a student's campus life as well. For example, a student living in the dorm may post that they need help in a particular area, allowing support staff to follow up with the student either online or face-to-face to provide individualized assistance. These sites may also indicate student behaviors that can indicate risk and trigger interventions from college staff (Junco, 2014) of either an academic or social nature. SNS have been heralded as avenues for student engagement, an important piece of the college experience, and a key ingredient in the retention of students (Junco, 2014).

Just as traditional college campuses include wide-open physical spaces for students and faculty to interact with each other in more informal ways (Blumenstyk, 2015), social media and SNS may extend this informal setting to the online communication space. Some students find through their online interactions with faculty that their faculty seem more approachable (Junco, 2014). In addition to typical social interactions with colleagues and staff, college students use Facebook to engage with their classmates for assistance with coursework, including organizing study groups, catching up on work they may have missed in class, and asking questions (Junco, 2014).

Email

Email, or electronic mail, essentially facilitates the exchange of electronic messages between two or more computer users (DeTienne, 2002; Isaacson, 2014). Email is not a relatively new technology; it was born in the early 1970s by those who were building what would later be called the Internet. It was, however, one of the very first methods of forming an online community (Isaacson, 2014) long before other social media arrived on the scene.

According to Statista, a statistics database for business platforms, there were more than 4 billion email users worldwide in 2020 and the estimate that there will be 4.6 billion by the end of 2025 (Tankovska, 2021). Email traffic is currently estimated at 319 billion emails each day and estimations that daily emails will reach 376 billion by the end of 2025 (J. Johnson, 2021). Even though email was invented a few decades ago and therefore is old by today's technology standards, it is still a mainstream element of the online experience as email accounts are required for nearly any type of online experience from SNS to online shopping (The Radicati Group, 2017) and applying to college. Email use is so prevalent that it is virtually the most common activity performed online (Kushlev & Dunn, 2015). There is a myriad of email service providers to choose from although the leading consumer email service companies currently are Google Gmail, Microsoft Outlook.com, and Yahoo! mail (The Radicati Group, 2017).

Email in a college setting. Email is a common form of communication on college campuses (Lancaster et al., 2007), and many colleges require students to have an email address to apply for admission. Often, at a particular point in the matriculation process, colleges provide a college network email address to students for use while

attending their school. This college-district-disseminated email address is expected to be used by students to communicate with faculty and staff as well as to receive information about the college they are attending, including event details, college announcements, and important dates and deadlines. Students use email to connect with other students for class information, group projects, and social items such as searching for housing. Some research indicates that students may favor email as a generalized communication channel (Chen, Jones, & Xu, 2012).

Microblogs

To understand microblogs, one must first understand a blog. The core definition of a blog is a website where an individual regularly provides updates that can range from comments, opinions, and ideas to the use of various media formats such as text, photos, video, or audio (Safko & Brake, 2009). Posts are commonly displayed in reverse chronological order, allowing a reader to follow the blogger's stream of consciousness. Importantly, readers are often allowed to post comments (Safko & Brake, 2009) for the originator of the blog as well, allowing for two-way communication. Blogs originally developed from online diaries or web logs where webpages were frequently updated with considerable time and skill into sites where blogging was made easy for the user such as blogger.com (Safko & Brake, 2009). Microblogging sites available today are similar to online blogs, offering short snippets of information or images. Microblogging has further developed the concept of extremely concise blogging, described as a "cross between blogging and text messaging" (Safko & Brake, 2009, p. 533) as well as increasing ease of access and use for the user, making it extremely popular.

Currently, some of the most well-known microblogging services are Twitter, Instagram, and Snapchat. Twitter is a social media tool that offers users the ability to send "tweets," which are short messages limited to 140 characters in length (DeGroot, Young, & VanSlette, 2015; Junco, 2014; Lowe & Laffey, 2011). These tweets are posted to Twitter feeds, allowing people to "follow" specific users (Junco, 2014; Lowe & Laffey, 2011). Twitter was one of the initial microblog companies and was first made available to the public in October of 2006 (Junco, 2014; Safko & Brake, 2009).

Instagram also allows users to post to a stream, although it focuses on photo-sharing from mobile devices, and adds the ability to apply photo filters (Junco, 2014); it is owned by Facebook (Baym, 2015). Snapchat is a photo-sharing application for mobile devices, which adds the ability to video-message (Junco, 2014). A significant difference between other microblogging sites and Snapchat is the ability to limit how long posted material is viewable before it is deleted from a mobile device (Baym, 2015; Junco, 2014), increasing the perception of user privacy (Junco, 2014).

An aspect of microblogging's popularity relies on the succinct manner through which text information is exchanged. The succinct manner of microblogging is enforced by character limitations, which is the very reason why the messages are read, because they are short (Safko & Brake, 2009). Plus, because of technological progress, microblogging is extremely easy for the users and may be as simple as sending a text message from their cell phone (Safko & Brake, 2009). One of the drawbacks of microblogging is the urge for people to post trivial things that may not be of value to their followers (Safko & Brake, 2009), akin to email spam. Nevertheless, microblogging has only grown in popularity as demonstrated in 2018 when the Pew Research Center

released a report outlining the use of microblogs by 18- to 24-year-olds, of whom nearly 80% use Snapchat, just over 70% use Instagram, and 45% use Twitter (Smith & Anderson, 2018).

Microblogs in a college setting. College students may use microblogs, such as Twitter, both inside and outside of the college classroom. In order to enhance classroom learning, students may follow their faculty members, ask questions about coursework, participate in class discussions, or follow organizations and professional societies (Jacquemin et al., 2014) as they relate to course content. One study found that the majority of students preferred the convenience of social media, such as Twitter, rather than online platforms, such as Blackboard (Jacquemin et al., 2014). Lowe and Laffey (2011) found that Twitter was viewed as more convenient when compared to other technologies because it can be used in the same manner as text messages from a mobile device. The short messages found on Twitter were also more likely to be read by students than longer messages found in emails (Lowe & Laffey, 2011). Some college staff found Twitter to be a good opportunity for sharing small nuggets of information with people who had already expressed an interest in a subject, such as intercollegiate athletics (K. Weaver, 2011), by their choice to follow a Twitter feed.

In addition to classroom and social activities, students may also find the need to share things related to service departments. Some service area departments choose to engage their students through Twitter to answer questions, enhance the students' informal learning about their processes and procedures, and in some cases, be able to assist the student with needs (Junco, 2014) that the student may or may not have been comfortable sharing in a face-to-face conversation or may not have been able to participate in because

of the lack of physical proximity or office hours. In addition, Twitter has demonstrated its ability to play a vital role with emergencies or natural disasters (Safko & Brake, 2009) on campus, such as school site shootings, allowing people to easily contact each other and their loved ones.

Instant Messaging

Although not singularly restricted to smartphones, one of the applications that make smartphones such an integral part of people's lives is the ability to instantly message other users, known as instant messaging (Junco & Timm, 2008). In fact, in recent years the prevalence of smartphones has blurred the line between texting (using the mobile device itself) and instant messaging (using an application downloaded to mobile device), simply becoming a method of synchronous communication between users. According to the Pew Research Center, a popular instant messaging application known as WhatsApp is used by 22% of Americans (Smith & Anderson, 2018) and more than 1 billion people across the globe (Kumar & Sharma, 2016) to message friends and family. WhatsApp allows text communication as well as photos, video, and audio messages (Kumar & Sharma, 2016), and it is especially popular with Latino Americans of whom 50% indicate that they are WhatsApp users (Smith & Anderson, 2018). Instant messaging is so commonplace as to have exceeded other forms of communication such as voice telephone and email (G. R. Roberts, 2005).

Although extensively popular now, instant messaging first became available in 1996 through software called ICQ (Huang & Yen, 2003). ICQ was soon purchased by AOL, which then created AOL Instant Messenger (AIM; Huang & Yen, 2003). Instant messaging was initially perceived to have advantages over email based on its ease-of-use

and the ability to convey emotion (Lancaster et al., 2007). Emotional icons, or emoticons, were some of the first visual ways that users could express how they felt outside of text (Safko & Brake, 2009); they are now rampant in almost all media and are known as emojis.

Instant messaging in a college setting. Instant messaging is a communication method popular on college campuses; it is used to trade messages, work on projects, and explore new things (Lancaster et al., 2007). Text messaging is also very important to students, especially within the social aspects of their lives (Chen et al., 2012). The prevalence of texting is so high that many students text, whether out of boredom, for work, or in response to incoming text messages while in class, even within classrooms where explicit no cell phone use policies are prescribed (Emanuel, 2013; Pettijohn, Frazier, Rieser, Vaughn, & Hupp-Wilds, 2015). Of course, frustrating to faculty perhaps is that most instant message applications can be used either from a computer or a mobile device, making it hard for faculty to distinguish between legitimate classroom use and inappropriate behavior.

Smartphones and Mobile Devices

The way people communicate with each other has been changed by mobile phones (Junco, 2014) and mobile devices, allowing person-to-person communication from almost any location (Baym, 2015). The increasing popularity of mobile devices is not restricted to cell phones as more and more small portable digital wireless devices are chosen over more traditional wired devices (Baym, 2015). With the increase of so many robust mobile devices, college constituency groups, including students, are increasingly able to communicate and access information from anywhere at any time (Pirani &

Sheehan, 2009). Mobile technologies increase people's effectiveness both in the workplace and with students, allowing educators new options to connect and interact with colleagues and students (L. A. Wankel & Blessinger, 2013).

The essence of a cell phone is a "battery-operated electronic device used for voice or data communication over a network of cell sites, which is interconnected to the public switched telephone network (PSTN)" (Safko & Brake, 2009, p. 393), and yet in society today, they are generally considered as so much more than that. Cell phones, and specifically smartphones, have changed the very nature of how people communicate. Reliance on cell phones and the increasing advancement within cell phone technology has now designated the cell phone as an "integrated personal computing device" (Junco & Timm, 2008, p. 10). Smartphones outsell personal computers in annual sales (Lum, 2012) and have integrated themselves into people's lives by sheer volume. People commonly purchase new phones every 2 years or so, both because of frequent new technology releases and relatively short agreements with cell companies (Amirault, 2015). For many, cell phones do not simply represent a method of communication, or meet their basic needs, but rather they are a status symbol (Emanuel, 2013).

Throughout daily life, more than 90% of mobile users keep their devices nearby at all times, even while sleeping (Friedrich, Peterson, & Koster, 2011). Cell phones are much more likely to be smartphones these days, and in addition to voice calls, may be used for text messaging, email, and social networking (Robinson & Stubberud, 2012) as well as Internet browsing, watching and recording videos, playing games, Bluetooth connectivity, or serving as an Internet hotspot for other devices (Safko & Brake, 2009).

These smartphones and other "ultraportable" devices such as tablets, have gained critical mass and are now considered mainstream devices (Ferreira et al., 2013).

Smartphones and mobile devices within a college setting. Cell phones, especially smartphones, have infiltrated people's daily lives to a great extent, and college students are no exception. Virtually every college student owns a cell phone (Junco & Cole-Avent, 2008; Junco & Timm, 2008; Kvavik, 2005), and for many college students, cell phones have replaced the use of landlines (Junco & Cole-Avent, 2008; Junco & Timm, 2008). Both smartphones and tablets are used daily by millions of higher education students (Emanuel, 2013; Ferreira et al., 2013) and are often kept close by at night (Friedrich et al., 2011). Cell phones are so prevalent that there is even a social stigma against not having one, which may lead students to be untruthful rather than admit to not owning one (Emanuel, 2013).

On any given day, students use the time between classes to engage people through social media, texting, voice and video chat, or to play games, use the Internet, and many other activities, all through the use of their smartphone (Emanuel, 2013). The majority of students often use their phones when bored and to obtain information urgently (Emanuel, 2013). Students believe the reason for them to have a phone is multifaceted, with safety at the core surrounded by the need to communicate with friends, family, and work as well as for entertainment and as an everyday tool (Emanuel, 2013).

A cell phone survey of college students indicated that students use their cell phones for a variety of activities although the most popular feature was texting (Emanuel, 2013). Students sent an average of more than 20 text messages per day to multiple individuals. Students texted their friends more often than their family members or their

work contacts. Some of the students had more than 200 phone numbers stored in their phones although they made few calls each day. Students who are interested in attending college would like to see admission forms available within the mobile space, and students who are already admitted would like to see helpful items such as bus schedules or dining hall menus available (Lum, 2012).

Challenges of Technology Within Higher Education

One of the major challenges colleges and universities face is keeping up with the ever-evolving technological world. Some of the difficulties associated with technology include the rapid change of technology itself, the expense of keeping up, and managing both the digital divide and students' expectations. And today's students are not the same as those who have come before them.

The Rapid Change of Technology

As technology advances, it is becoming a potentially unrealistic goal for colleges to keep up with the rate of technological change (Annan-Coultas, 2012) and the corresponding need to both absorb and respond to those advances (Bartkovich, 2011). Colleges are faced with rapidly increasing technology cycles (Junco, 2014; Phelan, 2016) often referred to as technology transience (Amirault, 2015) or obsolescence (Bartkovich, 2011), meaning the rate at which technology is accepted and passed on. Technology transience occurs when technology arrives and fades at such a fast rate that hardware and software are both replaced by the next newer technology in increasingly shorter timespans (Amirault, 2015). Technology transience is not restricted to hardware or software as content within these technological products often does not last long. For example, according to Lepore, the lifecycle of a webpage averages roughly 100 days

before becoming irrelevant (as cited in Amirault, 2015), and many mobile applications lose at least half of their followers within their first 3 months from inception (Gordon, 2014).

The replacement rate of technology has greatly surpassed that of the last centuries' rate when a product purchase came with the expectation that it would last for many years. This increase in technology transience means that both products and updates can be released at such a hurried rate that managing technological products can become difficult (Amirault, 2015), especially for institutional technology leaders and staff. Many higher education institutions are ill or underprepared to handle the growing demand for current technologies, such as making mobile services available (Lum, 2012; Pirani & Sheehan, 2009) and college staff may be "behind the curve in their use of technology" (Junco & Timm, 2008, p. 1).

Increasing Technology Costs and the Expense of Keeping Up

Technology transience also creates an additional hurdle for educational institutions. This is especially apparent when campus leaders, often in reaction to outside pressures, attempt large-scale change by implementing new technology requiring additional resources to be updated or maintained (Amirault, 2015). Colleges may feel that technology is a never-ending burden for spending needs because as soon as an investment is made in a particular technology, a new iteration of technology is released with even more capabilities (K. Weaver, 2011). This in turn causes some college leaders to be hesitant, wanting to be sure a new technology will have a successful implementation and outcome prior to committing resources (Karp & Fletcher, 2014).

Technology has eased financial pressures in some industries, and though perhaps allowing for a better delivery of higher education, new technologies applied in colleges and universities have most often added cost pressures rather than reducing them (Hirsch & Weber, 1999). Additional costs related to the adoption of new technologies include the need to hire information technology personnel (Bartkovich, 2011; Blumenstyk, 2015) as well as purchasing software licenses, maintenance contracts (Bartkovich, 2011), and upgrading both network infrastructure and servers (Ramage, 2011). Institutional budgets are often further stretched by the need to use technology maintenance windows, avoiding impact to student learning while causing an increase in personnel costs (Bartkovich, 2011) because of expenditures such as overtime and holiday pay. Moreover, community colleges are often dependent on public funding to a large degree, creating the need for information technology funding to be a collaborative and creative campus partnership (Bartkovich, 2011) within the funding source requirements.

Academia Is Not Known for Being Nimble

The opportunity for technological advancements has advanced at a fast pace while the implementation of those advancements still relies on the often slower social changes within the institutions themselves (Kvavik, 2005). In addition, the adoption of new technologies may be either openly integrated or stymied by organizational culture (Karp & Fletcher, 2014). Academic institutions are not known for speedily or readily accepting and adjusting to change (Rowley et al., 1997; K. Weaver, 2011) yet must recognize that the world in which students live is rapidly changing, requiring institutions to change as well (Treat, 2011).

At the community college level, the need to collaborate across all campus groups becomes vital for an institution's technology management strategy (Treat, 2011). All campus constituent groups must be engaged for such change to be successful because no one group or department can remain unaffected. Campus buy-in is also a must because implementing an electronic solution may reveal unforeseen hurdles within the infrastructure of an area, such as implementing a degree audit system and belatedly discovering the way an institution organizes its classes is inconsistent, requiring a collegewide system or process revision to fix the new root problem (Bailey & Smith Jaggars, 2015).

The Need for Mobile Service

The world has changed significantly in response to advancements in mobile technology becoming so prevalent it may be difficult to avoid the use of mobile applications (Kumar & Sharma, 2016). Mobile technologies are increasing in popularity, allowing students to learn virtually at any time or place (Ferreira et al., 2013; Vázquez-Cano, 2014; L. A. Wankel & Blessinger, 2013) and encouraging institutions around the world to implement mobile learning (Vázquez-Cano, 2014). As a result, higher education institutions face increased pressure for the availability of mobile solutions as all campus constituencies experience more and more time within the mobile space during their daily lives and activities (Lum, 2012). For many people, their primary access to the Internet is through their mobile devices, and that number was expected to rise to 4.7 billion people by the year 2020 (Friedrich et al., 2011). Consequently, many social media applications work better on mobile devices than on desktop computers (Safko & Brake, 2009).

The majority of students use mobile devices as part of their daily lives and expect to be able to access higher education through their mobile devices (Ferreira et al., 2013; Pirani & Sheehan, 2009). From a student's perspective, any task should be able to be accomplished on a smartphone, regardless of whether it is related to entertainment, communicating with others, or learning activities (Ramage, 2011). Students are clamoring for more higher education applications designed for mobile use, such as applying and registering for classes, perusing bus schedules and dining hall menus, and having the ability to determine which campus parking lots still have spaces available while en route (Lum, 2012).

Managing Technology Expectations

The differences in expectations between students and the colleges and universities they attend can cause tension (Hirsch & Weber, 1999). As new technologies are developed, students often adopt them before other college constituencies (Annan-Coultas, 2012), such as staff and administrators, further widening the gap between institutions and their constituents. This gap is often cause for concern with information technology departments as well because they are faced with managing divergent expectations of technology use between institutional faculty and staff and their students (Pirani & Sheehan, 2009).

Stereotypes of today's student. In stereotypical culture, a college student is a recent high school graduate who attends a 4-year college or university while living in a dorm (Blumenstyk, 2015). This student goes to college to experience college life, which is often categorized as the time in an individual's life where exploration occurs, and students' attitudes, values, and experiences often shift and change (Levine & Dean,

2012). Although perhaps a common image of college life, this image can be expanded upon with current student data.

Rather than engaging in a time of academic leisure, current college students are more likely to be working, and working longer hours (Blumenstyk, 2015; Levine & Dean, 2012), with nearly one third of college students working an average of 35 hours a week or more (Blumenstyk, 2015). Many students are attending college part-time and, in return, require more time in college to graduate (Blumenstyk, 2015; Levine & Dean, 2012) frequently because of work-related schedules (Blumenstyk, 2015) and the need to cover the rising costs of attending college (Levine & Dean, 2012). Nearly 37% of undergraduate college students attend part-time, and at community colleges nearly 60% of students attend part-time (Blumenstyk, 2015). The increase in the number of hours that students are working, and the decrease in the number of classes that students choose to take, begins to blend traditional and nontraditional students into general college students (Levine & Dean, 2012). In addition, many students who attend part-time do so because of family responsibilities including being parents themselves (Blumenstyk, 2015) and caring for their parents or family members.

Another stereotypical image of today's student stems from the tendency to address them as a generational group. Many of the students entering college may be categorized as the Millennial Generation, a term frequently referenced as millennials by Levine and Dean (2012). Other authors, such as Friedrich et al. (2011) and Morreale, Staley, Stavrositu, and Krakowiak (2015) used the term Generation C as a reference to how college students are "connected, communicating, content-centric, computerized, community-oriented, and always clicking" (Friedrich et al., 2011, p. 3). Several more

authors referred to this group as the Net Generation (S. Carlson, 2005; Oblinger & Hawkins, 2005; G. R. Roberts, 2005; Weiland, 2014).

The common thread among millennials, net-geners, and Generation C students is shared years of nativity, shared experiences, and similar characteristics. S. Carlson (2005) placed the birth years of net-geners or millennials roughly between 1980 and 1994, and Weiland (2014) defined Net Generation students as those born after 1990. Generation C students were considered by Friedrich et al. (2011) and Morreale et al. (2015) to have been born after the year 1990, experiencing their adolescent years sometime after the year 2000.

Students belonging to this generational group are the recipients of many stereotypical observations. They are generally known to be intelligent yet impatient, expecting immediate results, and seemingly never without their personal electronic devices (S. Carlson, 2005). Often referred to as multitaskers (Oblinger & Hawkins, 2005; G. R. Roberts, 2005), it is not uncommon for these students to use multiple methods of communication, such as email and instant messaging, while simultaneously watching television or surfing the web (G. R. Roberts, 2005). These students possess the ability to communicate both in person and online with fluid ease, preferring instantaneous feedback and looking to search engines such as Google for answers rather than traditional hard copy or multimedia sources (Oblinger & Hawkins, 2005). In their minds, technology should be adaptable to their needs, allowing them to customize their experience rather than posing a need for them to change (G. R. Roberts, 2005).

Authors agree that students deemed millennials are extremely technologically savvy, having been born into a technological world (Levine & Dean, 2012; Oblinger &

Hawkins, 2005; G. R. Roberts, 2005) and never having experienced a world where technology was not yet integrated into daily life. They have never experienced life without the benefits of the Internet, the use of mobile devices, and the ever-present world of social networking (Friedrich et al., 2011). They are a generation of students who are not intimidated but rather are empowered by the immense use of technology in the world today (Ferreira et al., 2013). As an example, for this generation of students (born after 1990), many forms of technology accepted today already existed, including Apple, Microsoft, and AOL; MySpace and Facebook were invented by the time they were in middle school, and YouTube, Twitter, and the iPhone were all invented before they had graduated high school (Levine & Dean, 2012). They have owned handheld electronic devices for most, if not all, of their lives (Friedrich et al., 2011).

This poses a perceptual gap for the generation entering college now because the idea of traditional education wherein the student is expected to passively learn from the teacher and the selected texts does not resonate (Ferreira et al., 2013). This is a fundamental shift for institutions of higher education, and colleges must consider a new way to operate to meet the needs of this fresh wave of characteristically technologically advanced students (Bajt, 2011; S. Carlson, 2005). And yet, to assume that all students of a generational group are technologically savvy would be incorrect (Jones, Ramanau, Cross, & Healing, 2010; Oblinger & Hawkins, 2005) as well.

Digital divide. The concept of a digital divide is generally interpreted to describe differences between students who may have grown up in a technological world and other typically older persons who have learned how to use technology later in their lives. Where authors disagree is whether this digital divide exists or not, and if it does exist, to

what extent. Prensky has emerged as a prominent author on the existence of the digital divide; his two-part article outlining the differences between digital natives and digital immigrants has been cited in more than 2,500 publications since its publication in 2001 (Prensky, 2001a, 2001b). In it, he explained that students think about and process information in a very different way than their predecessors, who are most frequently their educators. The world of these students is so fundamentally different in regard to technology that he coined them "digital natives," as in native speakers of a digital language. In contrast, he labeled those who have not grown up in a digital world as digital immigrants (Prensky, 2001a, 2001b).

Prensky (2009) later augmented his opinion, acknowledging that the gap between digital natives and digital immigrants would become less and less relevant as digital technology continues to grow. Other authors discouraged the notion of a digital divide as too reliant on a stereotypical definition of a student generation (Jones et al., 2010; Margaryan et al., 2011), suggesting that staff and faculty may be as uniquely aligned with technology as the students with whom they interact, depending on their own individual technology-related interests. Others contended that the digital divide is simply a distinction between those with access to the Internet and those without (Baym, 2015), and to assume that all students have either access or inclination as a digital native would further digital inequalities (Junco, 2014).

Nonetheless, there may be stereotypical differences between the average college student and the staff and faculty who serve them. Generally, students use social media more frequently than their faculty and are more open to including social media within the classroom in comparison with their faculty members (Jacquemin et al., 2014). College

staff may fall into two or more groups for social media use. Typical social media skeptics are often people employed at a higher level of an institution, holding a position with strong institutional influence, but who did not experience social media (Junco, 2014) in their formative years. Typical social media crusaders are people who may be new to their careers, yet in comparison to skeptics, their social media experience is vast because they have grown up with it throughout their entire lives (Junco, 2014).

It is worth noting that many faculty members do incorporate technology-based approaches for their classroom instruction strategies (Morreale et al., 2015). Typically, younger faculty are more readily accepting of new technology and are more likely to incorporate social media within their classroom curriculum (Junco, 2014). Other faculty, who are less inclusive, cite a lack of forethought in regard to which technologies are adopted on campus without testing to see which ones may fit appropriately (S. Carlson, 2005), and some student affairs staff complain that college students are better at electronic communication than they are at face-to-face communication (Levine & Dean, 2012).

Service expectations. College students view their relationship with their higher education institutions much like the relationships that they experience with other service providers such as utility companies and online and in-person retailers (Levine & Dean, 2012). Students, and in fact their parents, have begun to treat colleges as businesses and see themselves as consumers (Levine & Dean, 2012). According to Levine and Dean (2012), students are expecting the same few things from all their service providers: convenient service, quality, and low prices. They are also expecting instant information and immediate communication as the expectations of digital communication allow for

faster responses than ever before (Friedrich et al., 2011; Levine & Dean, 2012; Robinson & Stubberud, 2012), including the option to have live chat with student services professionals at all hours of the day or night (Ramage, 2011).

In regard to technology, students now expect the latest and greatest, including wide Internet bandwidth, in order to power multiple mobile devices at the same time and from anywhere on campus (Bartkovich, 2011). Students expect dependable and consistent access to their student information, such as financial aid, and expect to be able to use quality degree audit systems (Ramage, 2011).

Classroom disruption. Whether adopted primarily by staff or students, not all technological innovations are well received by educational instructors because students frequently use technological devices for off-task activities during class time (Annan-Coultas, 2012; Cheong et al., 2016; Ledbetter & Finn, 2016). The need to maintain classroom authority by faculty has led to extremes, even sabotaging electronic devices in class to set an example (Cheong et al., 2016). Other examples of the lengths the faculty will go to try to maintain classroom decorum include shutting off Wi-Fi in classrooms, threatening to answer students' phones when they ring, suspending the students from class, and assigning additional homework to those students whose phones ring or vibrate (Levine & Dean, 2012). Collectively, faculty often resort to one of several broad themes: the implementation of a policy or set of rules, the use of redirection, the enforcement of consequences, and the practice of deflection (Cheong et al., 2016).

Among instructor concerns are effects to student learning (Ledbetter & Finn, 2016), loss of class time due to digital distractions (Cheong et al., 2016), and the ability for instructors to keep up with new technologies (Annan-Coultas, 2012). Factors

increasing instructor concern and discomfiture in relation to their classroom authority are the desire held by many students for their instructors to engage them (Prensky, 2005) and teacher credibility (Ledbetter & Finn, 2016). Other factors include the difficulty in discovering digital distractions, which may be masked or disguised by classroom activities or otherwise authorized behavior, an unwillingness to use class time for discipline regarding digital distractions, and physical difficulties within the classroom itself (Cheong et al., 2016).

Also frequently found within the classroom-distraction debate is student laptop use, which can provide legitimate learning assistance such as note taking and access to the Internet and yet can also cause distractions, such as web surfing and technical issues (Annan-Coultas, 2012). Despite some negative perspectives, the use of laptops has often been touted as necessary to support student learning (Junco, 2014) although some studies have indicated that students who use laptops for activities that are unrelated to classroom instruction may be more likely to receive poor grades (Annan-Coultas, 2012; Kraushaar & Novak, 2010). The classroom laptop debate is also fueled by the students' need to switch between tasks through the use of digital devices, inherent with the increase of laptops, cell phones, college Wi-Fi access, and social media (Junco, 2014).

Student perspectives include different approaches to help decrease distractions, such as banning devices, removing Internet access, restricting or monitoring access as well as feeling a sense of ownership— that it is their own personal responsibility to monitor their level of distraction (Annan-Coultas, 2012). In fact, students are requesting more technology to be integrated into classroom curriculum (Levine & Dean, 2012) at the same time that faculty are trying to control the interaction of technology within the class

(Annan-Coultas, 2012; Cheong et al., 2016). It is likely that the friction between faculty and students in regard to the use of technology inside the classroom will continue unabated, especially as technology has advanced to allow the possibility of digital textbooks to be accessed through handheld devices such as large cell phones and touch pads, sometimes referred to as "phablets" (Phelan, 2016, p. 5).

Research on student cell phone use indicates that it will be difficult for faculty to win the war on cell phone use within the classroom as well. Researchers have found that students use cell phones within the classroom regardless of policies that may disallow their use (Emanuel, 2013; Pettijohn et al., 2015), and if faculty could harness the use of cell phones productively, they could be leveraged as an effective learning tool (Emanuel, 2013). In two studies, the majority of students texted in class at least occasionally and felt that cell phones and cell phone use should be allowed within the classroom (Emanuel, 2013; Pettijohn et al., 2015). In a study by Emanuel (2013), more than half of the students surveyed regularly checked their phone during class time, and those who admitted to checking their phones did so while trying to hide their cell phone use. In a study by Pettijohn et al. (2015), nearly 60% of students texted during class. Nearly 40% of those students admitted it was an outcome of boredom, and roughly 35% indicated their texting was related to their occupations (Pettijohn et al., 2015).

Student technology skills. Although many students who attend college today are considered technologically savvy, there are also students who need assistance with learning how to use technology. Colleges may not assume that the students they serve are prepared to use software applications required for coursework and college life and therefore must provide training opportunities for students (Junco, 2014; Kvavik, 2005).

Although technical skills are required to be successful in college, defining which technical skills a student should learn is difficult at times because of the rapid changes in the technology offered (Kvavik, 2005), which poses a challenge to colleges when trying to offer training to students.

Technology skill sets are required for life after college as well, and the concept of colleges preparing students with technical skill sets is supported by many authors. According to L. A. Wankel and Blessinger (2013), educational institutions should be responsible for preparing students to live in an interconnected and evolving world, and Vázquez-Cano (2014) emphasized the need for students to master a level of technical competence to be successful in life. Udochukwu Njoku (2015) offered the position that regardless of industry, an education must adequately equip people, and Sevillano-García and Vázquez-Cano (2015) promoted the attainment of transferable skills in accordance with societal demands. Grant, Malloy, and Murphy (2009) heralded the need for students to obtain sufficient computer skills to compete for a job, and Ramage (2011) supported the need for technology-related skill sets to be provided by colleges.

College Communication

Communication technology is no longer a luxury but a fundamental requirement for any organization (Rockmann & Northcraft, 2008) as the number of communication channels has grown exponentially and consumers have embraced both computers and mobile devices (Maity, Dass, & Kumar, 2018). The choice and use of a communication medium is a central need for organizations to improve organizational effectiveness (Armengol, Fernandez, Simo, & Sallan, 2017). Community college leaders are pursuing ways to better leverage technology for student learning and communications (Treat,

2011) and must find new solutions to enhance student success. Employers of community college graduates have expressed disappointment in their ability to communicate effectively (Ramage, 2011) and require students to be able to effectively use technology (Grant et al., 2009). The belief that communication needs to be improved is a common concern on many college campuses (Boggs & McPhail, 2016), and the importance and complexity of communication technology has grown within community colleges (Bartkovich, 2011).

Both institutional and organizational stakeholders want to understand how computer-mediated communication can increase understanding, the reasons behind why individuals choose one communication medium over another, and parameters by which to decide the types of information that are best delivered through which communication mediums (Palvia, Pinjani, Cannoy, & Jacks, 2011). An individual's choice to use a specific computer-based communication medium is a concern for researchers (Ku, Chu, & Tseng, 2013) and individual channel choice may be influenced by the user's perceived or actual experience as well as society (J. R. Carlson & Zmud, 1999) and other factors.

The physical interaction needed for communication has decreased exponentially as many communication channels have been replaced by digital media (Friedrich et al., 2011). Although there are many different communication methods, overall the most preferred is still face-to-face communication as the most effective (Lancaster et al., 2007). The richness of face-to-face communication may not be able to be replaced by electronic media (Rockmann & Northcraft, 2008) although electronic media is overwhelmingly becoming mainstream. Conversely, it is unrealistic to have face-to-face conversations with all members of an organization (Palvia et al., 2011).

In addition, the advent of richer media does not always indicate user adoption (Ku et al., 2013; Lo & Lie, 2008; Maity et al., 2018), only more options to choose from (Lo & Lie, 2008), and organizations should be selective in which media they choose. Each emerging communication technology faces competition from previously existing communication technologies (Lo & Lie, 2008). Some researchers suggested that chasing a more technologically advanced medium may not enhance results as much as choosing a variety of communication channels (Maity et al., 2018) within a set communication strategy.

Studies show that some communication methods are preferred for different tasks, such as the preference for instant messaging for personal or social use in the preference of email for work-related items (Lancaster et al., 2007). Many of the communication channels that students prefer to use for social purposes may not be those they prefer to use for school-related activities (Robinson & Stubberud, 2012). For example, Robinson and Stubberud (2012) found that students preferred to keep some communication channels for school while reserving others for social interaction. Email may be preferred for school communication (Robinson & Stubberud, 2012), but Facebook may be preferred as only a social communication channel (Ha & Dong Hee, 2014; Robinson & Stubberud, 2012). Yet social media may support the informal learning in relation to college policies and procedures required for students to be successful within the higher education world (Junco, 2014).

Colleges need to be aware of the communication channels preferred by students to meet the needs of their students (Robinson & Stubberud, 2012), and those communication channels may be different than what they prefer for social interaction (Ha

& Dong Hee, 2014; Robinson & Stubberud, 2012; Waycott et al., 2010). Students may perceive communication attempts by colleges through a communication medium reserved for social interaction as unwanted (Robinson & Stubberud, 2012). College constituencies may feel that electronically disseminated information is convenient, but the communication may not be reaching the recipients for which it is intended or accomplishing the communication goals for which it was originally inspired (Pirani & Sheehan, 2009). And although the use of social media is becoming more popular for higher education institutions, they must also remain aware that access and usage of communication technologies may not be experienced at the same rate across different student populations including those that are historically underrepresented (Perna, 2014).

One of the most important foundational aspects of using social media to communicate is first to know the audience and the content they need (Safko & Brake, 2009). Community college leaders are encouraged to have a strategic plan to implement the use of social media within their institutions, such as getting buy-in from colleagues and tackling privacy issues, while frequently engaging in social media themselves (Boggs & McPhail, 2016). Yet absent from these strategies is the need to engage students in the discussion and how to discover communication preferences within student populations.

Higher education must continue to engage the current generation in a dialogue regarding its expectations about technology and learning to assess how wide the window of opportunity may still be and how quickly it may be closing (G. R. Roberts, 2005). These generation-based student challenges are emphasized within community colleges as they educate disproportionally large populations of nontraditional age students as well as minorities and high-needs students (Blumenstyk, 2015), when compared to 4-year

colleges and universities. Therefore, community colleges must keep multiple generations in mind when making decisions about their student populations. Today's college students are generally considered to be tech savvy, intimately familiar with what technology has to offer, and therefore, organizations should design effective tools that can be embraced by college students (Lu et al., 2014).

The question for college students is, with the amount of communication technology prevalent in the world today, what does effective and appropriate communication look like (Morreale et al., 2015)? There is a widening gap of information knowledge between those at higher education institutions and the students with whom there are communicating. College students and college personnel may differ in their use of communication technologies. In addition, college personnel are the experts in how to do college. They must put themselves in the shoes of their students, who may not be familiar with college terminology and do not have the background to understand the messages they are receiving (Munter, 2012), to increase student understanding of message content. Higher education institutions must ensure that the students they serve are receiving sufficient communication and support (Fried et al., 2017) to complete their college goals.

Communication Strategies and Media Choice

Having so many communication technology options through which individuals, such as college students, can communicate emphasizes the importance of media choice. Many people choose different media strategically by considering the advantages and disadvantages of each feature, often choosing a different media for different communication purposes or audiences (Baym, 2015; DeTienne, 2002; Levine & Dean,

2012). The reach of digital communication media depends on various factors such as what type of media is selected (Baym, 2015). Each type of communication technology has advantages and disadvantages that fluctuate depending on the chosen audience, the person using the technology, and the costs associated with the chosen technology (DeTienne, 2002). Different technology-based communication mediums allow users to take advantage of different inherent benefits depending on their circumstances (Lo & Lie, 2008).

Authors offer differing guiding parameters to assess whether a communication medium is appropriate or not. According to Baym (2015), there are seven concepts to compare different types of communication media: interactivity, temporal structure, social cues, storage, replicability, reach, and mobility. Within Baym's work, interactivity describes the interaction between the user and the media as well as the interaction experienced between users through the media, and temporal structure describes the synchronous and asynchronous capabilities of different media. Some media may simply be asynchronous, but some synchronous media may at times be asynchronous because of other factors such as network conductivity or location.

Social cues, Baym (2015) continued, provide additional information regarding the context of the communication and its meaning. Storage refers to how long messages last and the potential maintenance involved in keeping those communications, and replicability is defined as the capacity of the media to provide a copy of the original message to a user when needed. The reach of a medium refers to the audience size to which the medium is capable of communicating, and mobility refers to how portable a

medium is. Baym concluded that these seven concepts are the basis to allow people to understand the differences and similarities of various communication media.

Although Baym (2015) offered a way to understand media features, Munter (2012) emphasized communication strategies and channel choice to achieve the expected audience response. The decision of which medium is selected to carry messages to an audience is referred to as channel choice (Munter, 2012). The decision of which medium to use, or channel choice, may be selected based on a particular communication strategy.

According to Munter (2012), there are five strategic variables on which to base communication: the communicator strategy, audience strategy, message strategy, channel choice strategy, and culture strategy. Munter outlined communicator strategy as the focus on the communicators themselves, their objectives, style, and credibility. Similarly, audience strategy refers to knowing who the audience is, as well as what they know and what they feel, to design communication that will most successfully affect the desired outcome. Next, message strategy involves a reflective thought process to intentionally structure the message in an effective way.

Munter's (2012) fourth strategy, channel choice strategy, refers to selecting a communication medium intentionally, with the objective in mind, rather than selecting a communication medium based on the initiator's level of comfort. Comparing communication media to make a selection is important, depending on the advantages and disadvantages of each medium. Munter compared advantages, such as the privacy of hard copy and the quick distribution of email, with the disadvantages, such as the overuse of instant messaging and the lack of control over who reads a webpage, of each communication channel.

The last strategy, culture strategy, refers to the acknowledgment of cultural norms, which may differ from audience to audience. Although this may include stereotypical cultural norms, this may also include organization-specific cultural norms such as the perceived formality of a communication medium in relation to another and organizational structure or group behavior. Munter (2012) theorized that all five variables are necessary components for a communication strategy to achieve a desired response from the audience.

Social media is one popular way to communicate to large groups of individuals. Within social media too, there are choices that communicators must make to ensure that communications are reaching their audiences and are well received. For example, trust within a network is required for social media communication to provide value (Safko & Brake, 2009), much along the lines of user credibility (Munter, 2012), and static content is viewed negatively in this light. The better the content that the communicators can provide, the more engaged their correspondents will be and the stronger their relationship will be (Clark, Fine, & Scheuer, 2017; Safko & Brake, 2009). At its core, social media is a tool to enable conversation within the audience communicators seek whether internally or externally to their organization (Safko & Brake, 2009).

According to Safko and Brake (2009), the four foundational concepts required for a social media strategy to work are communication, collaboration, education, and entertainment. The first concept, communication, instructs organizations to evaluate their communication, how it is perceived by their audience, and whether it is effective or not. The second concept, collaboration, encourages organizations to collaborate through electronic media with internal and external stakeholders. The third concept, education,

focuses on turning expertise into content that is digestible for the audience. The last concept, entertainment, outlines the need for organizational content to harness the attention of the audience through the use of humor as well as interesting or captivating content.

In addition to different communication media, there are different types of communication. Two-way communication, for instance, occurs between two parties regardless of the communication method. Two-way communication can be individual to individual or individual to many. When communicating to large groups, it is important to understand the choice to communicate or not, which can be enhanced or tarnished by push technology and pull technology. Push technology sends information out to all parties selected regardless of whether the parties have solicited the particular information or not, but pull technology allows information to be available whenever the audience members decide to pull, or access, the information (DeTienne, 2002).

Media Richness Theory

Organizations such as colleges face economic pressure and competition, forcing them to seek out ways to decrease costs while increasing their agility and response to consumer needs and wants including adopting new communication technologies (Palvia et al., 2011). Institutional stakeholders want to understand how computer-mediated communication can increase understanding, the reasons behind why individuals choose one communication medium over another, and parameters by which to decide the types of information that are best delivered through which communication mediums (Palvia et al., 2011). With so many communication technologies to choose from and a myriad of strategies and concepts, how can higher education institutions determine which

communication methods will be most effective for communicating with their students? Media richness theory is an avenue by which leaders and researchers can evaluate which communication mediums are preferred (Armengol et al., 2017; Kahai & Cooper, 2003) by their audience members.

Media richness theory overview. Media richness theory (MRT) was first introduced by Daft and Lengel (1986) and is sometimes referred to as information richness theory (Huang, Hung, & Yen, 2006; Lu et al., 2014). Daft and Lengel (1986) theorized that the need for organizations to process information was twofold: to reduce uncertainty and equivocality. Uncertainty relates to the need for more information, or information deficiency, and equivocality is described as confusion, misunderstanding, or lack of understanding (Daft, Lengel, & Trevino, 1987). In other words, the need for organizations to communicate is for the benefit of understanding for its members, and media richness bolsters shared meaning and understanding (Daft & Lengel, 1984). Based on their work, all communication media can be placed on a continuum, ranked in order of richness (Daft & Lengel, 1986; Newberry, 2001) in comparison to the medium on either side.

The richest medium on the continuum is face-to-face communication (Daft & Lengel, 1986; Daft et al., 1987; Newberry, 2001). The leanest medium is more formal, often unaddressed, hard copy documents such as a flyer (Daft et al., 1987) or an online threaded discussion (Newberry, 2001) communicating simple data to a wide audience in very plain text. Lean media, such as plain text documents, may be useful in communicating information yet are unable to transfer as much information as other communication mediums (Daft et al., 1987). Rich media allows for a recipient to

understand the information quickly, but lean media may change the recipient's understanding although within a longer timeframe (Huang et al., 2006) and often with the need for additional communication.

The placement of media on this continuum was originally designed to allow organizations to decide which communication medium to employ for effective results (Kishi, 2008). For effective communication, organizations should pair a communication task with the communication medium best capable of fulfilling the need (Kishi, 2008; Lengel & Daft, 1988), matching the richness of the medium with the ambiguity level of the message (Daft et al., 1987). This process of pairing the communication medium with tasks has been expanded to include individual media choice (Kishi, 2008). Communication within organizations or between individuals is effective depending on "the selection of a medium that has the capacity to engage both the sender and receiver and mutual understanding of the message at hand" (Lengel & Daft, 1988, p. 229).

The matching of the richness of a communication medium and the nature of a message is what leads to effective communication (Lengel & Daft, 1988). Conversely, communication failures occur when a mismatch takes place (Daft et al., 1987; Lengel & Daft, 1988) such as when a lean communication medium is used when a rich medium may have achieved better results (Lengel & Daft, 1988). If data are oversimplified, important nuances may be lost, and when face-to-face communication is unnecessary, surplus information may be exchanged, leading to overcomplication or distraction on the receivers' part (Daft et al., 1987)

Media richness. At the heart of media richness theory is the ability to evaluate the richness of a communication medium. Richness can be defined as the amount of

content information that is both sent and transferred (Lu et al., 2014), or the ability of a communication medium to convey information (Newberry, 2001) to facilitate understanding (Daft et al., 1987). A communication medium that is rich is able to convey both "insight and rapid understanding" (Daft et al., 1987, p. 358). To rate the richness of a communication medium, the medium must be evaluated across a blend of four elements: the immediacy of feedback, multiple cues, the variety of language, and the ability to be focused personally (Lengel & Daft, 1988; Schmitz & Fulk, 1991; Yu, Lin, & Liao, 2017).

Each of these elements can be explained further. The immediacy of feedback refers to both the speed and the quality of the interpretation by the users (Lan & Sie, 2010), allowing for swift questions and answers, clarification, corrections, or reinforcement (Daft et al., 1987). This element also helps to outline whether a medium is synchronous or asynchronous (Kishi, 2008). The next element, multiple cues, refers to nuances within general human communication including cues, such as body language, given by the sender that can be interpreted by the information receiver. These multiple cues may include the physicality of the sender, voice tone, physical gestures, such as a smile or a wink, or numbers and graphics (Daft et al., 1987) conveying meaning in addition to the basic information or data. These cues may help to capture subtleties within the message, facilitate a more emotional exchange, and help to convey a sense of urgency (Lengel & Daft, 1988).

The element of language variety is defined as the "range of meaning that can be conveyed with language symbols" (Daft et al., 1987, p. 358) such as numbers (Lo & Lie, 2008). The use of numbers may be able to provide greater precision with the transfer of

information, and the ability to use a wide variety of language facilitates the exchange of broader ideas or concepts (Lan & Sie, 2010). This element also refers to the ability of a user to use natural language (Armengol et al., 2017) without constraints.

The last element, personal focus, refers to the intent of the communication content and its ability to convey personal feelings or emotions (Daft et al., 1987; Lan & Sie, 2010). In addition, personal focus also refers to the ability to tailor message content to the specific receiver (Lan & Sie, 2010). This personally tailored content may be in regard to the receiver's situation, needs, or frame of reference, and as such, may be better received (Daft et al., 1987) than communication without a personal focus.

Richness continuum evolution. The richness continuum places communication media on a scale based on whether the media is determined to be rich or lean in its ability to facilitate understanding (Daft & Lengel, 1986; Newberry, 2001). When media richness theory was first developed, fewer communication channels existed than are available today. Lean media was originally categorized as text, such as unaddressed hard copy informational flyers posted on bulletin boards, which was not as rich as a telephone conversation, and neither were as rich as a face-to-face conversation (Daft et al., 1987). Face-to-face communication is the richest medium because it is able to incorporate all of the evaluation criteria (Daft et al., 1987; Kishi, 2008; Saat & Selamat, 2014). Yet face-to-face communication is often not feasible for large groups or organizations and is associated with higher costs when compared to computer-mediated communication (Lo & Lie, 2008).

With the invention of the Internet and the profusion of new communication channels, the meaning of richness is changing (Maity et al., 2018; Saat & Selamat, 2014).

New technology allows communication mediums to provide richer information and more channel choices for delivery than ever before (Lo & Lie, 2008). Yet media richness theory still applies, as the ability to rate a communication medium's richness places it on a scale in comparison to other mediums, and therefore it may be adapted for use with any communication medium (J. R. Carlson & Zmud, 1999). The level of richness could still be expected to be higher for communication that is oral versus written and synchronous rather than asynchronous (Kishi, 2008). Lean media may only provide information that is simply text within a small user interface, but rich media can include options such as audio or video within larger interfaces (Maity et al., 2018).

Therefore, although not envisioned as part of the original media richness theory design, electronic media have now been included within the expanded framework of media richness theory (Kishi, 2008). Initially, the richness of a medium was an inherent part of the medium's capabilities (Kishi, 2008; Lengel & Daft, 1988) and now, as new communication channels are adopted, what users perceive to be rich or lean is shifting (Maity et al., 2018; Saat & Selamat, 2014).

In some cases, a communication medium may be considered either rich or lean depending on how it is used. For example, a website may be considered either rich or lean depending on how it is presented and what characteristics the author chooses to employ such as text, images, video, and choice of navigation (Saat & Selamat, 2014). Email and other web-based technologies are additional examples of communication media that may be considered either lean or rich depending on context (Palvia et al., 2011). Therefore, the richness of a medium may also stem from how it is used rather than from its inherent ability alone (Saat & Selamat, 2014).

In addition, different communication mediums can be perceived as having richer or leaner richness based on their mobile friendliness. A variety of communication mediums may be perceived as synchronous because of the use of mobile technologies whereas otherwise they may not be considered so (Park & Sundar, 2015). The instantaneous exchange of communication within the mobile environment allows users to see an increased sense of presence (Park & Sundar, 2015).

Email as an example. Email is widely accepted and has a long history as a computer-mediated communication medium (Huang et al., 2006; Kushlev & Dunn, 2015; The Radicati Group, 2017), yet the perceived richness of email has changed over time, based on many of the elements and contexts outlined above. Studies demonstrate that email is now considered a richer medium, either more rich than originally believed, or the medium has in fact changed and become enriched (Palvia et al., 2011) with increased functionality.

Some of the richness of email has changed because of technological innovation and some of its richness depends on its users. As a lean communication medium, email can entail long messages of plain text with delayed responses, whose users may not expect immediate feedback, may be considered asynchronous (Huang et al., 2006), and could include drawbacks such as information overload. Email may be used for both formal and informal communication (Huang et al., 2006) for either professional or social situations.

Email may be perceived as a rich medium as well. Technological innovations within mobile technologies have increased the synchronicity of some communication mediums, such as email (Park & Sundar, 2015), by allowing the exchange of emails to

become synchronous or near synchronous depending on network conductivity and other such variables. In addition, although user-dependent, an email's perceived richness may be increased by the ability to use text in a myriad of color and fonts, include links to websites, images, and a wide variety of attachment capabilities such as word documents or video and audio files. Within this context, users without much experience may not perceive email as a rich medium or at least not until they have more experience within the medium (J. R. Carlson & Zmud, 1999).

Summary

Communication within an organization increases the ability to reach goals and objectives (Armengol et al., 2017) such as a college's objective to increase student success. Eloy Oakley, Chancellor of the California Community Colleges system, believes the system "should review its entire education technology portfolio with the goals of enhancing students' abilities to easily access services and information, and maximizing the ability of faculty and staff to use those systems to serve students effectively" (Fried et al., 2017, p. 27). Within his vision for success, he outlines that

> colleges should augment and enhance student services to monitor student progress more closely and intervene more assertively with strategies such as online tools to help students clearly see their own progress toward educational goals, alerts that remind students of upcoming deadlines, and automatic flags for intervention when students miss an enrollment deadline or fail a class. (Fried et al., 2017)

Keeping up with the communication media preferences of students is often difficult because once institutions and parents adapt to their preferred media, students tend to move on to another or new choice (Robinson & Stubberud, 2012). Frequent

periodic research is required to address the shifting needs and preferences regarding communication channels (Junco & Timm, 2008; Robinson & Stubberud, 2012; Taylor & Steele, 2014), and future research is needed to explore the reasons behind their preference for different communication channels (Robinson & Stubberud, 2012). Colleges must learn how students choose to use technology and how it affects their lives in order to increase student success (Junco & Timm, 2008).

CHAPTER III: METHODOLOGY

To address the shifting needs and preferences of college students in regard to communication channels, frequent periodic research is required (Junco & Timm, 2008; Robinson & Stubberud, 2012; Taylor & Steele, 2014). This continuing research is needed to explore the reasons behind college students' preferences for different communication channels (Robinson & Stubberud, 2012). Colleges must learn how students choose to use technology to increase student success (Junco & Timm, 2008).

Chapter III focuses on the methodology used for this study, which was designed to further the needs listed above. The chapter begins with a review of the purpose statement and research questions. Next, the research design of this mixed methods study including the population, sample, sample size, and instrumentation are all thoroughly described. Subsequently, this chapter includes information on the data collection, data analysis, and limitations of the study. A summary is then offered at the conclusion of this chapter.

Purpose Statement

The purpose of this mixed methods study was to explore and describe the communication technologies that community college students perceive are effective ways to receive information from their college. A secondary purpose was to explore and describe communication technology channels students perceive would be effective ways to receive information from their college that are not being used.

Research Questions

1. How do community college students perceive the effectiveness of their community college's technology channels in place for receiving information from the college?

2. Do community college students prefer the use of technology channels for communication that are not used by their college?

Research Design

A plan that describes the procedures of data collection, subject selection, and data analysis, along with their conditions, is known as a research design (McMillan & Schumacher, 2010). An important reason for outlining detailed research design is to allow for replication of the study (McMillan & Schumacher, 2010; C. M. Roberts, 2010) to deepen or expand the research with future studies.

A quantitative research method seeks to describe a phenomenon through the use of numerical data and is generally considered confirmatory research, and a qualitative research method gathers data to formulate a narrative regarding the information and is generally considered exploratory research (Teddlie & Tashakkori, 2009). A research study is deemed a mixed methods study when it combines elements of both quantitative and qualitative methodologies within the research process (McMillan & Schumacher, 2010; Teddlie & Tashakkori, 2009) culminating in research findings that are presented in both narrative and numerical forms (Teddlie & Tashakkori, 2009). A benefit of quantitative methods is to earn a statistical aggregation of the data, providing a generalizable set of data, and the depth of understanding can be increased by qualitative methods (Patton, 2015) and may provide context (McMillan & Schumacher, 2010). Therefore, an advantage of using mixed methods research is the ability to pose both confirmatory and exploratory techniques within the same study (Teddlie & Tashakkori, 2009). In addition, using a mixed methods design ensures a richer evidence base than relying on one method alone, and the combination of both quantitative and qualitative

findings significantly increases educators' understanding within educational settings (Sammons, 2010).

There were two basic mixed methods designs considered for this study: parallel and sequential. A parallel mixed methods design has both the quantitative and qualitative research elements take place at or near the same time, and one does not inform the other (Teddlie & Tashakkori, 2009). In a sequential mixed methods design, the quantitative and qualitative research elements take place in a specific order, and the latter research element is either dependent on the former or is informed by the former (Teddlie & Tashakkori, 2009).

The research design selected for this study was a sequential mixed methods research design. A sequential mixed methods research design was selected because it allows for qualitative data to further explain quantitative findings (McMillan & Schumacher, 2010). The initial research method of a questionnaire was designed with closed questions to gather quantitative data. These data were then used to inform the semistructured questions applied to the focus groups, which took place after the questionnaire was administered. The questionnaire gathered principally quantitative data related to which communication technologies are perceived to be effective by students, and the focus groups gathered principally qualitative data, allowing for a deeper understanding of the characteristics that made each communication technology effective. A common mixed methods research design includes a questionnaire and in-depth interviews; one data type provides greater depth, and one provides greater breadth, producing results that allow for more accurate inferences (Teddlie & Tashakkori, 2009) as was the nature of this design.

Population

According to McMillan and Schumacher (2010), a population is "a group of individuals, objects, or events, that conform to the specific criteria and to which we intend to generalize the results of the research" (p. 129). In addition to a population, research studies often include a target population. A target population may differ slightly from the population to which results will be generalized by sharing more specific characteristics than the population in its entirety (McMillan & Schumacher, 2010). The population for this study was community college students of whom there are 10 million annually in the United States (Bailey & Smith Jaggars, 2015), and the target population was community college students within California, of whom there are 2.1 million annually (California Community Colleges Chancellor's Office, 2021b).

Sample Frame

A sampling frame identifies some limitations on the generalizability of a study to an entire population (McMillan & Schumacher, 2010). The sample frame for this study was delimited to include students attending California community colleges located within the California Association of Community College Registrars and Admissions Officers (CACCRAO) Region 4 during the 2020-2021 school year. The total student headcount for the colleges located within this region was 131,052 during the spring term of 2019 (California Community Colleges Chancellor's Office, 2019). CACCRAO Region 4 includes 13 community colleges, located within the following five counties: Alameda, Monterey, San Benito, Santa Clara, and Santa Cruz (CACCRAO Regions Map, n.d.).

Sample

For the purpose of this study, the researcher used nonprobability, purposeful sampling. In nonprobability sampling, participants are not selected at random but are chosen specifically because they represent a specific characteristic of the population such as being a student (McMillan & Schumacher, 2010). Purposeful sampling narrows the selection of participants further by requiring characteristics of the population whom they represent (McMillan & Schumacher, 2010) such as attending a specific college. The subjects for the quantitative portion of this study were selected by nonprobability purposeful sampling as students who attend either of the two specific sample colleges for this study.

Participants for the qualitative portion of this study were selected through a mixed methods sequence of sampling techniques. First, as with the quantitative sample, purposeful sampling narrowed the potential participants to those students attending one of the two colleges (McMillan & Schumacher, 2010). Then, the qualitative sample was narrowed further through volunteer sampling (McMillan & Schumacher, 2010) by the act of the students supplying their contact information during the survey process if they were interested in participating in a focus group. Finally, the sample was narrowed by quota sampling. Quota sampling occurs when participants are selected based on their characteristics until an appropriate number of participants is reached (McMillan & Schumacher, 2010). Quota sampling can be flexible to allow an anticipated number of participants to change as the study unfolds (Patton, 2015) or to satisfy an anticipated number of participants such as five students for a focus group.

Sample Size

The number of individuals participating in a study is known as the sample size (McMillan & Schumacher, 2010). For quantitative research, the sample size need not be overly large as a small percentage of the population "can approximate the characteristics of the population satisfactorily" (McMillan & Schumacher, 2010, p. 141). For qualitative research, samples range from one to 40 and may seem small when generalized to a larger population (McMillan & Schumacher, 2010). However, within qualitative research, sample size depends more on the information richness than the sample size itself (McMillan & Schumacher, 2010).

There were 13 colleges within CACCRAO Region 4 with a student population total over 130,000 during the spring of 2019 (California Community Colleges Chancellor's Office, 2019). The researcher used geographical proximity sampling in relation to the researcher to select two colleges within CACCRAO Region 4 from two separate counties representing nearly 23,000 students to participate in the study (California Community Colleges Chancellor's Office, 2019). For the qualitative interview focus group portion of the study, the sample size was five students from each college, for a total of 10 students identified through volunteer and quota sampling (please see Figure 1).

Quota sampling allows researchers to recruit people who meet the population sample criteria until a predetermined and specified number of people is reached (Mack, Woodsong, MacQueen, Guest, & Namey, 2005). The survey instrument was sent to all students, 18 years of age or older, who attended the two study participant colleges. For this study, the researcher used five students per virtual interview focus group, one group

from each of the colleges participating in the study. The quota sampling criteria for participating in the interview focus group for this study were (a) to be a student attending one of the sample colleges, (b) to have participated in the online survey portion of the study, and (c) to have expressed interest in participating in a focus group by submitting their contact information at the end of the survey. Once the survey had closed, the researcher had a list of students who had submitted their contact information. The researcher then used a random table of numbers to sample and contacted each student to determine whether the student was willing to participate in the focus group, could attend at the scheduled session, and was willing to submit the consent form.

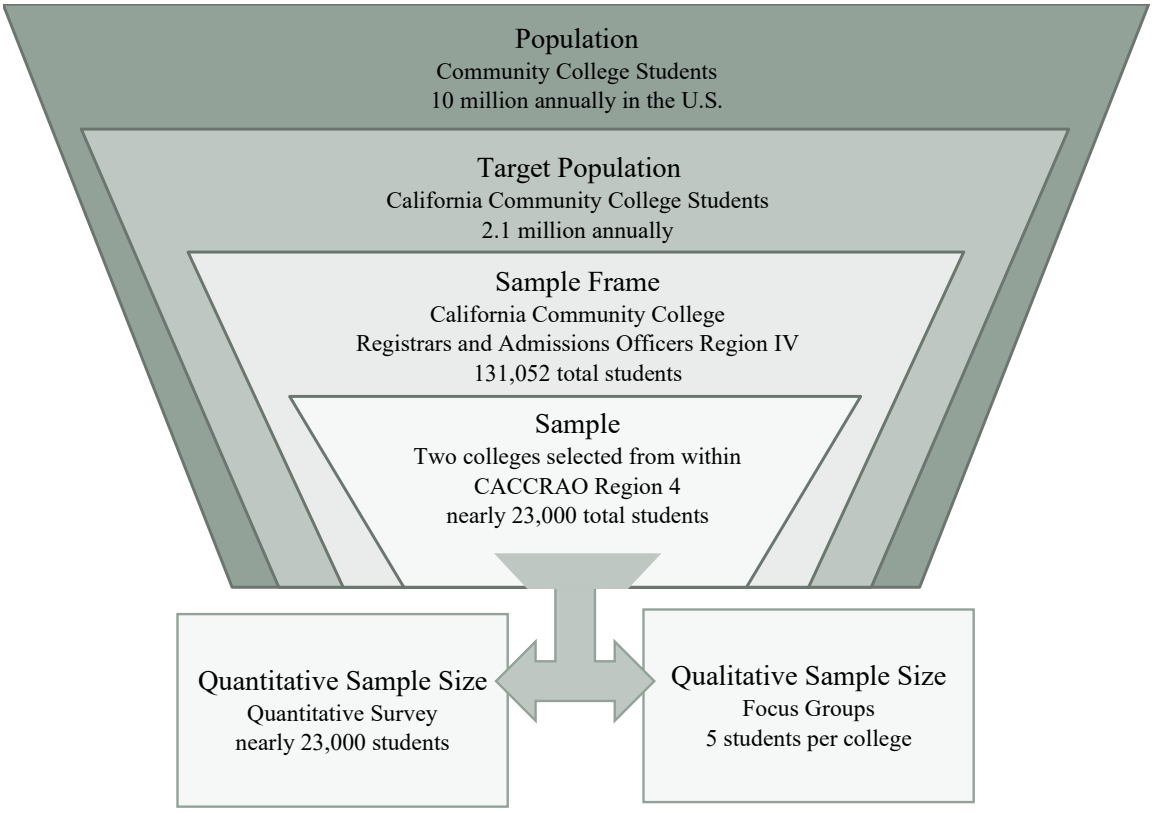

Figure 1. Flowchart of the progression from the study's population through to the study's quantitative and qualitative samples.

Instrumentation

As a mixed methods study, both a quantitative and qualitative research method were chosen. A survey questionnaire was chosen as a quantitative method. For the qualitative method portion, the use of a focus group was selected.

Quantitative Method

A questionnaire was chosen as an appropriate quantitative instrument for this study because it is an efficient data collection strategy (Teddlie & Tashakkori, 2009) and is the most widely used (McMillan & Schumacher, 2010). A questionnaire asks the same questions of all subjects, ensures the anonymity of those subjects, and is a widely used tool for gathering information (McMillan & Schumacher, 2010). Questionnaires are often used in research in the field of education as they allow accurate information to be obtained with a small sample (McMillan & Schumacher, 2010).

An electronic questionnaire was selected because of the size of the population, the distance between the population and the researcher, and the familiarity of electronic questionnaires. Online questionnaires can be effective for reaching a large number of participants with a high response rate (McMillan & Schumacher, 2010), are more efficient than paper questionnaires, and limit human error (Clark et al., 2017). Additionally, questionnaires are often used in studies within the media richness theory framework (e.g., Kishi, 2008; Ku et al., 2013; Lancaster et al., 2007).

The researcher developed an electronic questionnaire based on the research questions and synthesis matrix (Appendix B) in consultation with an expert panel. The panel's two experts worked within the field of education and held doctoral degrees. Additionally, the panel experts had experience conducting research in the field. These

experts reviewed the wording of the questions and the relevance to the research questions. Feedback from the panel experts was incorporated into the final version. Then, a chart of the alignment of each research question to the corresponding questionnaire question was created by the researcher (Appendix C).

The questionnaire included structured or limited-response questions, which require participants to select one of the choices presented (McMillan & Schumacher, 2010). In addition to structured questions, a Likert scale was created for the questionnaire. The use of scales, such as a Likert scale, allows for accurate assessments of participants' beliefs or opinions based on the use of gradations (McMillan & Schumacher, 2010). Researchers working within the media richness framework have used Likert scales (Kishi, 2008; Lancaster et al., 2007) when surveying participants as to their opinions or beliefs.

Qualitative Method

A focus group is when a group of people is interviewed at once rather than each person individually (Grudens-Schuck, Allen, & Larson, 2004; McMillan & Schumacher, 2010). Group interviews, such as focus groups, allow for rich data collection from participants' interaction with each other in addition to the facilitator (Grudens-Schuck et al., 2004). Additionally, focus groups may garner data that could be missed by the use of a survey (Grudens-Schuck et al., 2004).

Focus groups were chosen as an appropriate instrument for this study because they increase both the quality and richness of data collected. They are more efficient than individual interviews and often create a social environment where individuals respond to one another's contributions, thus deepening the richness of the data collected (Grudens-

Schuck et al., 2004; McMillan & Schumacher, 2010; Patton, 2015). In addition, focus groups may be used to corroborate the initial findings of a study as well as to answer questions that surface within the first phase of research (McMillan & Schumacher, 2010), as in sequential mixed methods studies. Although not often used as a research technique within a media richness theory framework, which often focuses on quantitative data, focus groups were an appropriate research technique for this study to deepen and corroborate the data generated by the questionnaire (Grudens-Schuck et al., 2004).

According to McMillan and Schumacher (2010) and Patton (2015), focus groups should number more than five yet less than 12 persons at a time, and the persons should be unknown to one another yet similar enough to enhance rather than hinder group dynamics. For the purpose of this mixed methods study, each focus group from each college had five to seven students. By asking questions, the leader facilitated the discussion while an assistant helped to make observations and recorded the information gathered (McMillan & Schumacher, 2010; Teddlie & Tashakkori, 2009). The questions for the focus groups were semistructured in nature without preselected choices for the participants yet suitably specific in their intent (McMillan & Schumacher, 2010). The focus group questions and a chart of the alignment of each research question to the corresponding focus group question were created by the researcher (Appendices D and E).

Semistructured interview questions allow a deep discussion on specific topics with an emphasis on understanding the response (Harrell & Bradley, 2009). Questions that cause participants to begin talking about their own experiences, yet in a focused manner, are often referred to as grand tour questions (Harrell & Bradley, 2009; Leech,

2002). Additional important semistructured questions include example questions, which probe participants for specific descriptive responses, and native language questions, which request the participants to explain the terms or specific vocabulary they use and what they mean to them (Harrell & Bradley, 2009; Leech, 2002). Focus groups allow for diverse perspectives and are often enjoyable for the participants (Patton, 2015).

Validity and Reliability

Reliability is the gauge of whether or not a measurement tool measures something consistently (C. M. Roberts, 2010; Salkind, 2014). Validity is the gauge of whether or not a measurement tool measures what it is supposed to (Kimberlin & Winterstein, 2008; C. M. Roberts, 2010; Salkind, 2014). Both validity and reliability are required to increase the credibility of a study's results (McMillan & Schumacher, 2010; Salkind, 2014). For mixed methods research, high overall data quality is obtained when the data from both the quantitative and qualitative portions of the study are valid and credible (Teddlie & Tashakkori, 2009). Focus groups, as a type of supplementary technique, and the use of mechanically recorded data (Creswell, 2007; McMillan & Schumacher, 2010) increase the validity and credibility of the study (McMillan & Schumacher, 2010).

Field Testing

Authors agree that if researchers choose to create their own instrument, it must be tested prior to use (e.g., Kimberlin & Winterstein, 2008; C. M. Roberts, 2010; Rothgeb, 2008) although the terms used and the steps involved differ from author to author. Common terms for these instrument tests include field test (C. M. Roberts, 2010), pilot test or pretest (Kimberlin & Winterstein, 2008; McMillan & Schumacher, 2010; Rothgeb, 2008), and field pretest (Rothgeb, 2008). Some authors, such as Kimberlin and

Winterstein (2008) and Rothgeb (2008), suggested that the terms pretest and pilot test may be interchangeable, although other authors, such as McMillan and Schumacher (2010), used the terms to relate to specific individual steps within the validation process.

In addition to testing researcher-designed instruments on others for feedback, some authors suggested that researchers consult experts in the field (Kimberlin & Winterstein, 2008; McMillan & Schumacher, 2010) to increase the validity of their instruments. Content validity especially relies on experts within the field (Kimberlin & Winterstein, 2008). All types of field testing and expert consultation serve as a vital part of instrument validation to ensure the quality of the data collected (Rothgeb, 2008) and to reduce errors (Kimberlin & Winterstein, 2008). For this study, the researcher consulted with a panel of two experts within the field. Both experts held doctoral degrees and worked within the education field. Feedback from the panel experts was incorporated into the final version of the questionnaire.

As the questionnaire for this study was created by the researcher (Appendix B), it was additionally important to conduct a field test. The first step for field testing the questionnaire was to request that several individuals read the questions and provide feedback to make revisions (McMillan & Schumacher, 2010; Rothgeb, 2008) such as adjusting how a question was worded for clarity. The second step for field testing the questionnaire was to conduct a pilot test. For the pilot test, several subjects with the same characteristics as those of the participants studied were asked to take the questionnaire in its final draft format, including the revised questions, an introduction, and a formal set of instructions (McMillan & Schumacher, 2010) to receive feedback on the entire questionnaire process. After completing the questionnaire, the pilot test subjects

provided feedback to the researcher regarding the instrument as a whole, which was incorporated into the final version of the questionnaire used for the study.

In addition to the questionnaire, the focus group interview questions were also field-tested virtually. According to McMillan and Schumacher (2010), when conducting interviews, a pilot test is required to check for bias within the interviewer, the questions, and the procedure itself. For this study, the pilot test provided an opportunity to assess the length of the interview and provided the researcher with an idea of how the data could be summarized (McMillan & Schumacher, 2010). Additionally, the focus group interviewees were asked to complete a series of feedback questions. As a result of this virtual field testing, any required changes were adopted.

Content Validity

In addition to field testing the questionnaire and focus group interview process, experts within the field were consulted to increase the validity of the instruments (Kimberlin & Winterstein, 2008; McMillan & Schumacher, 2010). Both the questionnaire and the focus group interview questions were reviewed by two individuals employed within the educational field. Both individuals held doctoral degrees and had experience conducting research in the field. Feedback from these field experts was then incorporated into the final instruments.

Triangulation

Triangulation is the ability to use multiple data sources to validate said data or to cross-validate from more than one data source (McMillan & Schumacher, 2010; Teddlie & Tashakkori, 2009). Using multimethod strategies within a single study allows for triangulation (McMillan & Schumacher, 2010), thereby strengthening the study (Patton,

2015). This study triangulated the data generated by using methodological triangulation or multiple methods (Patton, 2015) by incorporating both a questionnaire and a focus group.

Data Collection

The data for the study were collected through two separate means: an electronic questionnaire and virtual focus groups. For permission to collect data, the research proposal was approved through an institutional review board so the researcher could conduct research with human subjects. This section details the steps taken for the data collection of this study.

Institutional Review Board

Before a researcher may conduct research involving human participants, permission must be granted by an institutional review board (Creswell, 2007; C. M. Roberts, 2010). The purpose of institutional review boards is to review study proposals involving human subjects for potential negative impact or risk to the participants involved to protect them from harm (Creswell, 2007; C. M. Roberts, 2010). In addition, institutional review boards help to ensure that federal regulations are followed and that the proposed study addresses any ethical issues (McMillan & Schumacher, 2010). For this study, a proposal was submitted to the Brandman University Institutional Research Board (BUIRB). Approval from the BUIRB (Appendix F) was the last step required prior to beginning research.

Questionnaire

The questionnaire, designed by the researcher, was created through the use of SurveyMonkey (https://surveymonkey.com). Two identical versions of the survey

questions, with customized introductions for each college selected for the study, were created (Appendix G). The sample colleges agreed to send the survey link directly to the students attending their college. A consent form, confidentiality statement, and instructions were included as part of the beginning of the survey. The questionnaire was available to all participants for a period of 2 weeks.

Focus Groups

After the surveys were completed, the researcher facilitated a focus group interview session virtually with the participant students selected at each college, with a fellow researcher as an observer and assistant. The participants for the focus groups were identified from a pool of survey respondents who expressed interest in participating. The researcher contacted the students who volunteered to confirm participation of each student until an appropriate number of students was able to participate.

One focus group session took place virtually for each college. The facilitator and observer met the students in a virtual room to conduct the focus group. First, the researcher welcomed the students, explained the nature of the study, and explained that participation in the focus group was voluntary. The researcher also explained that although the researcher would keep everything as confidential as possible, the researcher could not control participants' future actions. Names would only be used as part of the data analysis and no student's name would be present in the final study. Students who wanted to participate in the focus group were only allowed to do so once a signed consent form authorizing the students' participation and agreeing to have the session recorded was received by the researcher.

Data Analysis

Data analysis may vary between qualitative and quantitative research. For quantitative data, the process includes preparing and organizing the data for analysis and performing descriptive or inferential statistical tests (C. M. Roberts, 2010). For qualitative research, data analysis begins with the process of preparing and organizing the data for analysis, narrowing the data into themes through coding (Creswell, 2007; C. M. Roberts, 2010), and then presenting the data through appropriate means such as a figure or table (Creswell, 2007).

Quantitative Data

Using descriptive statistics is a basic way to summarize and present quantitative data (McMillan & Schumacher, 2010) by describing the characteristics of the data collected (Salkind, 2014). Descriptive statistics include using mathematical formulas to readily represent observations by organizing and reducing a great number of observations into a manageable format (McMillan & Schumacher, 2010).

According to Salkind (2014), one of the easiest ways to organize data is to compute one of several types of averages, known as measures of central tendency. Measures of central tendency are three ways to calculate an average: the mean, the median, and the mode (Salkind, 2014). The mean is the most commonly used, computed by adding all the values of a group together and then dividing by how many values there are in the group (McMillan & Schumacher, 2010; Salkind, 2014). The median is the number that represents the midpoint of a group of values, and the mode is the value that occurs most frequently within the data set (McMillan & Schumacher, 2010; Salkind, 2014).

The quantitative data for this study were collected through a questionnaire. To describe the data, the data were first organized using the measures of central tendency (Salkind, 2014). The researcher then calculated the mean, median, and mode for each data set.

Qualitative Data

Qualitative data are generally not described by statistics but are narrowed into themes through coding (Creswell, 2007; C. M. Roberts, 2010). Qualitative data may be analyzed by identifying, coding, categorizing, classifying, and labeling patterns found within the data (Patton, 2015), resulting in themes. Then, the data are presented through appropriate means such as a figure or table (Creswell, 2007). For this study, the researcher transcribed the recorded auditory data, created codes for the data, and established inter-rater reliability. Additionally, the researcher used a computer software application named NVivo to develop themes and patterns and assist with data coding.

Data transcription. The process whereby a researcher gathers information and transforms it into a format that allows for analysis is called data transcription (McMillan & Schumacher, 2010). The focus group at each college was recorded using virtual meeting software technology. The recording of each focus group was then transcribed by the researcher into a typewritten transcript. Creating a transcript from the data recorded at each of the focus groups prepared the data in such a way as to allow the researcher to subsequently code the data.

Data coding. According to McMillan and Schumacher (2010), there are five basic steps to identify and refine qualitative data codes. These steps include getting a sense of the whole picture presented, selecting initial codes from within the data

themselves, addressing duplication within the initial codes, testing the resulting codes for feasibility, and finally, continuing to refine the coding system selected (McMillan & Schumacher, 2010). A software program named Excel was used to assist with the data coding as computer programs can often aid researchers with the data analysis process (Creswell, 2007).

Inter-rater reliability. The reliability of data is important for a research study. Inter-rater reliability occurs when multiple people observe or rate a data element in the same way, creating a consistency of measurement (McMillan & Schumacher, 2010). To achieve inter-rater reliability, the persons rating the data must rate the same data consistently the same way yet independently of each other (Kimberlin & Winterstein, 2008), especially for data that are either observed or involve human judgment. Measuring qualitative data relies on the judgment or rating of individuals; consequently, there must be consistency between individuals' ratings for data to be considered valid (Kimberlin & Winterstein, 2008; McMillan & Schumacher, 2010).

Therefore, to achieve inter-rater reliability for this study, a research expert with both a doctoral degree and experience coding qualitative data was asked to independently code a portion of the transcribed qualitative data for each of the focus groups. The research expert coded 10% of the transcribed data and reviewed the themes to reach an 80% or higher level of inter-rater agreement. The final themes and presentation of the data are presented in Chapter IV.

Limitations

Specific elements of a study that may negatively affect the results or the researcher's ability to generalize the findings are called limitations (C. M. Roberts, 2010).

Limitations unlike delimitations are typically items over which the researcher does not have control (C. M. Roberts, 2010). The limitations for this study include the sample size, the use of focus groups, the use of email as the sole communication tool with study participants, and the researcher as an instrument.

The first limitation for this study was the sample size of participating students. The community colleges selected for the study represented a particular geographical area and collectively the college student population surveyed was nearly 23,000 students. When results were generalized to the population, however, there were annually more than 2.1 million community college students within the California Community Colleges system (California Community Colleges Chancellor's Office, 2021b) and 10 million community college students nationally (Bailey & Smith Jaggars, 2015).

Another limitation was specifically within the use of focus groups. Limitations of focus groups include managing the interview so that a few individuals do not dominate the process, encouraging individuals with a minority perspective to speak up (Patton, 2015), and being unable to ensure total confidentiality (McMillan & Schumacher, 2010; Patton, 2015).

An additional limitation for this study was the sole use of email to communicate with study participants. The survey was sent out via email and study participants for the focus groups were also communicated with by email. The only communication that took place outside of email was the content of the focus groups.

The last limitation was that of the researcher as a research instrument or as the facilitator of the focus groups. When a researcher is an instrument in a qualitative study, the credibility of the study is directly linked to the credibility of the researcher (Patton,

2015). Therefore, researchers must engage in reflexive self-scrutiny, asking difficult questions of themselves to be neutral and objective (McMillan & Schumacher, 2010) throughout the qualitative research process. In addition, researchers must be mindful and enhance their self-awareness in an interview role as the interviewer may affect the interviewees and vice versa (Patton, 2015). The researcher for this study has a background in counseling and is experienced with both establishing rapport and interviewing individuals. To reduce bias, the researcher field-tested the questions, recorded the focus group sessions, and engaged the assistance of an observer and research expert.

Summary

This chapter began with an overview followed by the purpose statement and research questions. Then, a detailed account of the research design was discussed. Both the population and sample were outlined. Next came a detailed account of the instrumentation used in the study as well as the measures used to ensure validity and reliability. Subsequently, both data collection and data analysis were described. In conclusion, the limitations of the study were described.

CHAPTER IV: RESEARCH, DATA COLLECTION, AND FINDINGS

The preceding chapters have served to provide an outline of the problem, a literature review of available research, and the methodology for the study. Chapter IV revisits the purpose, research questions, methodology, data collection procedures, population, and sample, before presenting the data collected. The findings for this study are also provided within Chapter IV.

Overview

This mixed methods study explored student perceptions of the effectiveness of communication channels in place at their college and described communication channel preferences for communication channels that were not in place. Chapter IV presents the results obtained through the data collection from both the quantitative online survey and the qualitative focus groups. First the chapter reviews the purpose and research questions. Then the chapter shares the research methods and data collection procedures, followed by information on the population and sample. Next a presentation and analysis of the data is presented within the context of answering each research question. Each research question sought answers with both quantitative and qualitative data collection. For each research question, the data results are presented for the quantitative results from the survey and then the qualitative results from the focus groups. For each area of data results, tables and figures have been prepared to present the data when appropriate.

Purpose Statement

The purpose of this mixed methods study was to explore and describe the communication technologies that community college students perceive are effective ways to receive information from their college. A secondary purpose was to explore and

describe communication technology channels students perceived would be effective ways to receive information from their college that are not being used.

Research Questions

1. How do community college students perceive the effectiveness of their community college's technology channels in place for receiving information from the college?
2. Do community college students prefer the use of technology channels for communication that are not used by their college?

Research Methods and Data Collection Procedures

The research method chosen for this study was a sequential mixed methods design. The first research method was a quantitative survey followed by a qualitative focus group interview. By using a sequential mixed method, the survey results were able to inform the focus group interviews.

The online survey was designed by the researcher. It was then field-tested and modified, and then feedback from experts within the field was incorporated. The study participant colleges sent the survey invitation email (Appendix G) out to all students 18 years of age or older who were attending their colleges during the spring 2021 semester. The survey invitation email, including a link to the survey, and administered through SurveyMonkey, was sent to 17,485 students. After the conclusion of the survey, the study participant colleges forwarded the collected survey data to the researcher. The researcher reviewed the collected data for completion and appropriateness. After the researcher's review, it was determined that 496 valid surveys were completed.

At the end of the online survey, students were able to provide their email address if they were interested in participating in a focus group interview. After the surveys

closed, there were 59 students interested in participating in a focus group interview. Out of those 59 students, 11 engaged in email correspondence with the researcher. Six students were expected to participate in the focus group interviews and three ultimately participated.

Inter-Rater Reliability

Inter-rater reliability is when multiple people observe or rate a data element in the same way, creating a consistency of measurement (McMillan & Schumacher, 2010). For this study, a research expert with a doctoral degree was asked to independently code a portion of the transcribed qualitative data for each of the focus groups to achieve inter-rater reliability. The research expert coded 10% of the transcribed data and reviewed the themes to reach an 80% or higher level of inter-rater agreement.

Population

According to McMillan and Schumacher (2010), a population is "a group of individuals, objects, or events, that conform to the specific criteria and to which we intend to generalize the results of the research" (p. 129). The population for this study was community college students of which there are 10 million annually in the United States (Bailey & Smith Jaggars, 2015), while the target population was community college students within California of which there are 2.1 million annually (California Community Colleges Chancellor's Office, 2021b). The sample frame for this study was delimited to include students attending California community colleges located within the California Association of Community College Registrars and Admissions Officers (CACCRAO) Region 4 during the spring 2021 semester.

Sample

The participants for this study were selected by nonprobability purposeful sampling; they were students who attended one of the two study participant colleges and were at least 18 years of age. For the quantitative survey, purposeful sampling was the only sampling type required. For the qualitative portion of the study, students were first selected by purposeful sampling through the use of the survey, then the sample was narrowed through volunteer sampling, as students provided their contact information during the survey process if they were interested in participating in a focus group. Finally, the qualitative sample was further narrowed by quota sampling, as the researcher worked with participants to schedule focus groups of no more than five participants.

Demographic Data

The demographics for the study participants begin with age; students who were age 18 or over were eligible to participate while anyone younger was not. No more demographic data were collected for study participants completing the survey; they were conducted anonymously. For the focus groups, two students presented as potentially identifying as male for gender and one as female.

Presentation and Analysis of the Data

To answer the research questions, a sequential mixed methods research study was conducted to investigate the communication channel preferences of community college students. The first portion of the study was a quantitative survey that then informed the second part of the study, which consisted of qualitative focus group interviews. Then the qualitative focus group interviews validated the quantitative data collection. The following sections present and analyze the data collected.

Presentation and Analysis of Data for Research Question 1

The majority of the survey questions were designed (Appendix C) to answer the first research question: "How do community college students perceive the effectiveness of their community college's technology channels in place for receiving information from the college?" The opening survey question was an exploratory question seeking to investigate, through student awareness and feedback, which communication channels were in use at the study participants' colleges. A variety of communication channels were indicated to be in use by the study participants' colleges. Figure 2 presents the communication channel findings from the survey results.

As shown in Figure 2, the data set for each communication channel is listed, with email (493) being reported with the highest frequency. Text or instant messages (139) followed email, then SNS (89), and then finally microblogs (27). In addition to the structured response options, there was an open-ended option for students to enter in the communication technology channels in addition to those specifically listed. There were 78 responses that included communication channels currently in use (in addition to those communication channels specifically included in the survey). Of those 78 responses, 61 referred to Canvas, an online learning platform. Of smaller note, five responses indicated the college website, four responses referred to hardcopy mail, while a multitude of single responses included items such as: Piazza, Pronto, Discord, Ellucian Go Mobile App, mobile calls, and Zoom.

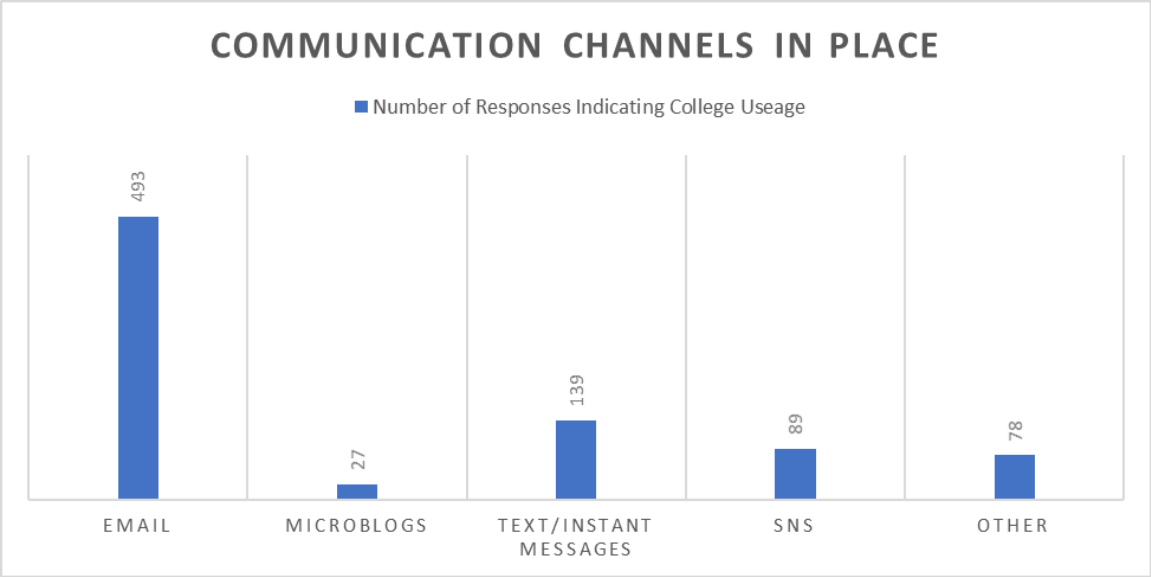

Figure 2. Communication channels in place at the study participant colleges, as reported by students

After specifying which communication channels were in use at their college, participants were asked to indicate, using a Likert scale, whether or not the communication channels in use were effective overall. Using Likert scales allows for accurate assessments of participants' beliefs or opinions based on the use of gradations (McMillan & Schumacher, 2010), and researchers working within the media richness framework have used Likert scales (Kishi, 2008; Lancaster et al., 2007) when surveying participants about their opinions or beliefs. For this study, the questions were rated using a 4-point scale defined as 4 (*strongly agree*), 3 (*agree*), 2 (*disagree*), and 1 (*strongly disagree*).

Using this Likert scale, students designated whether they agreed or not and to what degree with the following statement: The communication technology channels my college uses are effective communication tools for receiving official college information. The results, shown in Table 1, indicated that the majority of students agreed to some

Table 1

Overall Effectiveness of Communication Channels in Place

	Strongly agree		Agree		Disagree		Strongly disagree					
Survey question	*n*	%	*n*	%	*n*	%	*n*	%	Abstentions	*N*	*M*	*SD*
The communication technology channels my college uses are effective communication tools for receiving official college information.	211	43	261	53	19	4	5	1	0	496	3.37	2.89

degree that the communication channels currently in use were effective overall; 96% of respondents agreed that the communication channels were effective. Only 5% disagreed and there were no abstentions.

The next several survey questions, using the same Likert scale, investigated each communication channel (Appendix C) more deeply, by asking the students to what degree they agreed or disagreed with the effectiveness of each communication channel studied: email, microblogs, text messages, and SNS. When participants did not specify their degree of agreement for a specific communication channel, it was marked as an abstention and was not included in the total used to calculate the mean. Table 2 presents the findings for each communication channel.

After collecting and analyzing the survey data, the results indicated that many students agreed email was effective. A total of 96% of respondents agreed to some degree that email is effective, while only 3% disagreed, and one respondent abstained. The effectiveness of microblogs was more disparate, as 46% of respondents agreed microblogs are effective to some degree while 56% indicated that they were not. Also of note, the largest number of abstentions for any communication channel was for microblogs with 11 abstentions. The results for text messages or instant messaging apps also indicated that the majority of students agreed that they are effective. For text messages, 79% of students indicated they were effective, while 21% disagreed to some degree, and two abstained. The results for social networking sites (SNS) were also closely linked, with the majority just slightly tipped toward disagreement, or not effective. In this case, 41% of students agreed to some degree that are effective while 60% disagreed to some degree and six students abstained.

Table 2

Summary of Responses for the Degree of Effectiveness for Technology Channels as Perceived by Students

Communication channel	Strongly agree		Agree		Disagree		Strongly disagree		Abstentions	*N**	*M*	*SD*
	N	%	*n*	%	*n*	%	*n*	%				
Email	280	57	198	40	14	3	3	1	1	494	3.53	3.04
Microblog (Example: Twitter or Instagram)	41	9	179	38	180	38	85	18	11	474	2.42	2.02
Test Message (Example: cell phone or WhatsApp)	161	33	226	46	85	17	22	4	2	492	3.08	2.65
Social Networking Sites (SNS) (Example: Facebook or MySpace)	48	10	151	31	190	39	101	21	6	484	2.33	1.96
Other	24	5	66	14	275	58	121	25	10	476	2.03	1.61

*The total number of survey responses is different for each communication channel because of abstentions.

In addition to the survey questions, qualitative data were also collected through focus group interviews. After answering the survey questions, students were able to provide their email address if they were interested in participating in a focus group. Students who submitted their email address were contacted by the researcher offering them the opportunity to participate. Of the 59 students who indicated they were interested in participating in a focus group, 11 engaged in correspondence with the researcher. Of the 11 correspondents, six students expected to participate, although three students ultimately were interviewed, including at least one student from each participating college.

For the focus group interviews the researcher, along with an observer, met with the focus group participants via Zoom. The researcher, using the focus group interview protocol (Appendix D), welcomed all of the students, provided space for introductions, and an icebreaker to relax the group. Then the researcher provided guidelines for etiquette and expectations for the meeting, reviewed the Brandman Bill of Rights, and the study participant consent form before beginning the interviews. In order to participate, study participants had either returned a signed study consent form to the researcher in advance of the interviews or provided verbal consent as part of the recorded interview.

The researcher developed rapport by actively engaging the students, making eye contact when appropriate, and using nonverbal cues. These included nodding and using body language to show that the researcher was listening and had understood the participants. Additionally, the researcher provided affirming verbal cues, such as thanking each participant for their contributions after each question.

Transcripts were rendered from the focus group interview recordings. To establish inter-rater reliability, the researcher shared these transcripts with a fellow researcher with a doctoral degree and experience working with data. The two researchers reviewed the transcripts to discover themes and create codes, then they met to discuss the findings. The attending researcher coded at least 10% of the transcribed data to reach an 80% or higher level of inter-rater agreement.

To analyze qualitative data, meaning is found by examining the data for patterns and themes, culminating in the development of codes (which can be thought of as labels). Deductive codes are used when the data are analyzed according to a framework already in existence (Patton, 2015) often with predefined codes stemming from previous research (Medelyan, 2021). Inductive codes emerge from the researcher's interactions with the data (Patton, 2015), starting with the qualitative data itself and allowing codes to arise from the analytic process (Medelyan, 2021). The codes developed for this study were a blend of both deductive and inductive codes founded within the literature review and determined after reading the focus group transcripts. Initially both researchers reviewed the data and determined codes independently. Then the final codes were developed in consultation between the researchers as per inter-rater reliability standards.

The media richness theory framework provided for the deductive codes. Media richness theory states that communication mediums must be evaluated across a blend of four elements: the immediacy of feedback, multiple cues, the variety of language, and the ability to be focused personally (Lengel & Daft, 1988; Schmitz & Fulk, 1991; Yu et al., 2017). After reviewing the data, the researchers agreed that three of these four elements

were present within the data and made appropriate codes. The researchers chose to name these three codes: Synchronicity and Immediacy, Multiple Cues, and Personability.

After the identification of the initial deductive codes, the researchers agreed that there was additional data that did not fit within them, requiring additional codes to represent the remaining data. One of the themes presented to the researchers was the idea of students being able to receive communication on their own terms when and if they were ready to receive communication. To the researchers, this concept seemed similar to what had been described in the literature review as the distinction between push technology and pull technology by DeTienne (2002). Thus, the first inductive code was named Push and Pull Technology.

The last code created by the researchers was also an inductive code, stemming entirely from review of the data. This last code was created to represent an additional data theme identified by the researchers, which described how easy a communication medium was to use. The researchers chose to name this code Accessibility and Ease of Use.

Several of the codes identified within the data were considered to make communication mediums effective to the students at times and ineffective at others. To express this phenomenon, or "two sides of the same coin," the researchers chose to place all of the codes into two hierarchal groups: effective and ineffective. This was determined for two reasons; first the data presented occasions where a code was considered positive and occasions where the same code was not considered positive. The second reason was the very nature of the research questions for the study itself, which sought to determine how community college students perceived the effectiveness of the

communication channels in place at their colleges, or in short, whether they were effective or ineffective.

Therefore, the specific codes that were considered effective at times and ineffective at other times were thought of to be multifunctional codes and in need of being distinguished as either effective or ineffective for each time the code was used. As such, these multifunctional codes were distinguished with either an "E" for effective or an "I" for ineffective in parentheses (please see Figure 3), then ultimately for ease of use in presenting the data, the remaining two codes were also labeled as "E" for effective so as to have all codes labeled with either an (E) or an (I). Overall, the researchers identified eight codes to use in presenting the qualitative data. Two of the codes, Accessibility and Ease of Use (E), and Multiple Cues (E), were found only to be effective. The remaining six codes represent the multifunctionality of Synchronicity and Immediacy, Personability, and Push and Pull Technology, which were found to be both effective (E) and ineffective (I).

Effective Codes (E)	Ineffective Codes (I)
Synchronicity and Immediacy (E)	Synchronicity and Immediacy (I)
Personability (E)	Personability (I)
Push and Pull Technology (E)	Push and Pull Technology (I)
Accessibility and Ease of Use (E)	
Multiple Cues (E)	

Figure 3. Hierarchy of codes developed from qualitative data.

Using the codes developed, a final analysis of the data was performed. The overall frequency totals presented within the effective and ineffective umbrella categories for communication channels in place at the colleges are presented in Figure 4. A close majority of codes indicated a higher frequency of ineffective codes (19 or 54%), than

effective codes (16 or 46%). In addition to the overall effectiveness, a frequency analysis was developed for each communication channel currently in place at the colleges. The results of these findings are presented in Figure 5 and in complete details in Table 3.

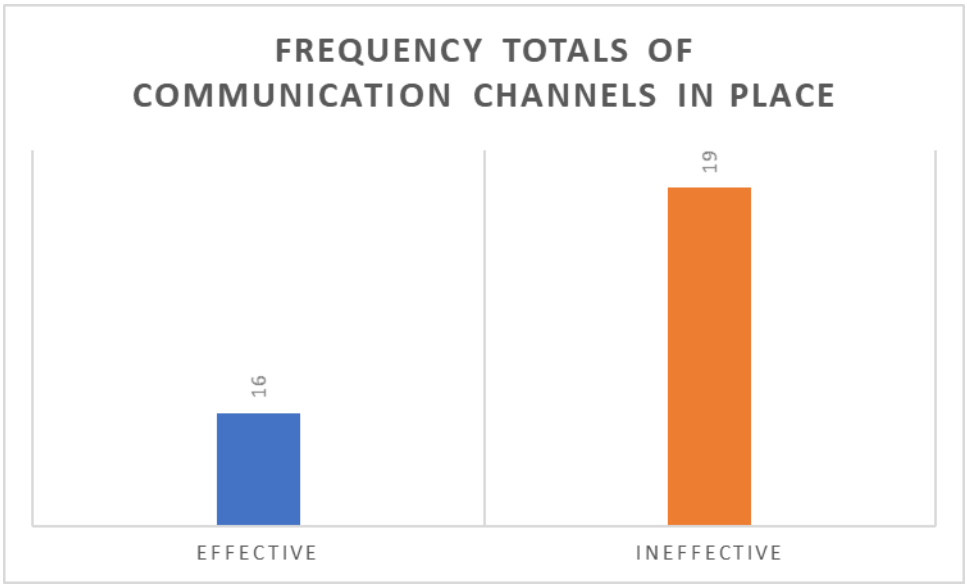

Figure 4. Frequency totals of communication channels in place.

Email received the highest frequency of codes out of all the communication channels already in place. The total frequency of codes for email was 18, with 10 effective and 8 ineffective. The highest frequency of effective codes for email was the Accessibility or Ease of Use code (5), while the highest frequency of ineffective codes was Synchronicity and Immediacy (I) (6). Example participant comments citing email as an effective tool included "email is convenient," and "caters more to the people who might not be as tech savvy." While comments citing email as an ineffective tool included "it can sit in my email box for three or four days before I actually get to it" and "I might not check it right away."

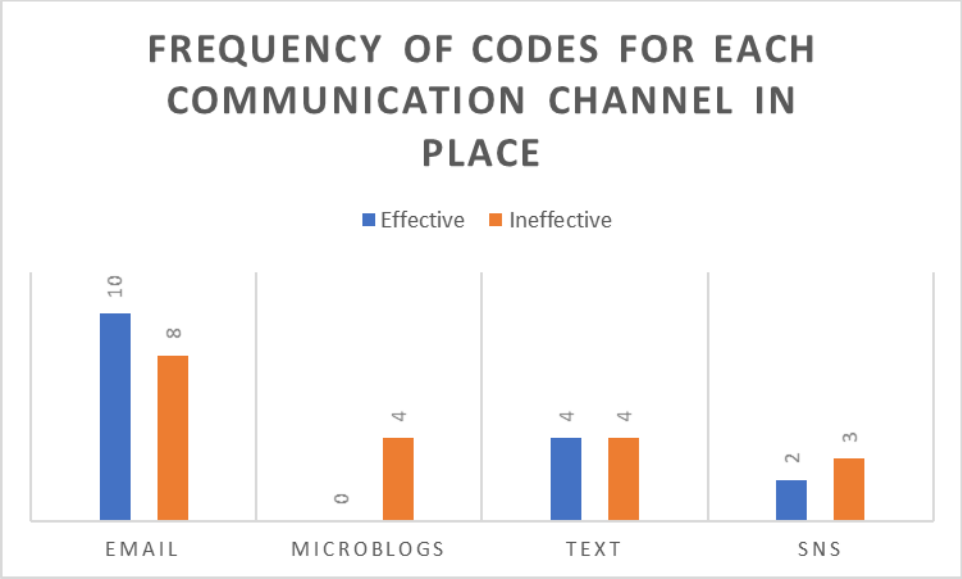

Figure 5. Frequency of hierarchical effective and ineffective codes for each communication channel in place.

Microblogs received a total frequency of 4 codes. All the codes were ineffective codes, including two for Personability (I) and one each for Synchronicity and Immediacy (I) and Push and Pull Technology (I). Example participant comments included, "Those types of communications are more like a casual method" and "you have to go check that."

Texting received twice as many codes as microblogs (8), half of which were effective codes and half of which were not. The effective codes were for Synchronicity and Immediacy (E), while the ineffective codes were split between Personability (I) (1), and Push and Pull Technology (I) (3). Example participant comments for text messages included "works well, because you get to receive the message you know almost instantly" and "the downside is that it can be a little bit intrusive."

Table 3

Detailed Account of Code Frequencies for Each Communication Channel Currently in Place

Effective codes	Email #	Microblogs #	Text message #	SNS #	Frequency total for each code #
Synchronicity and Immediacy (E)	1	0	4	0	5
Personability (E)	0	0	0	1	1
Push and Pull Technology (E)	4	0	0	1	5
Accessibility and Ease of Use (E)	5	0	0	0	5
Multiple Cues (E)	0	0	0	0	0
Ineffective Codes					
Synchronicity and Immediacy (I)	6	1	0	0	7
Personability (I)	2	2	1	3	8
Push and Pull Technology (I)	0	1	3	0	4
Total frequency for each communication channel	18	4	8	5	35*

*Grand total of all codes for all communication channels currently in place.

SNS received a frequency of one more than microblogs for a total frequency of five codes. The highest frequency was for Personability (I) with a result of 3, while both Personability (E) and Push and Pull Technology (E) each received a frequency of 1. Example participant comments for SNS included, “I don't see that as anything personalized” and “I like that I can be incognito.”

Presentation and Analysis of the Data for Research Question 2

Many of the questions outlined in both the online survey and in the focus group interviews were designed to answer the first research question. However, portions of both the quantitative survey and the qualitative focus groups were also designed to answer the second research question. The second research question was, “Do community

college students prefer the use of technology channels for communication that are not used by their college?"

The survey asked students questions about the communication channels their colleges were currently using to communicate with them, the results of which are presented with the first research question. Presented within this section is an additional survey question, which asked students if they preferred to receive official communication through communication channels that their college did not use. Only 19% of respondents indicated that they agreed to some degree with that statement, while 83% of respondents disagreed with the statement, with two abstentions. A partially open-ended follow-up question asked students if they did in fact prefer a communication channel not currently in use, to please share which communication they preferred.

Perhaps ironically, many of the suggested communication channel options the participants selected for this question were the very same communication channels participants had already indicated were currently in use by their college previously in the survey. For example, some students indicated that they would prefer to use email, although that communication channel was already in use, which they also indicated earlier in the survey process. Although it should be stated, a few participants did indicate communication channels that were already in use by the college, which they themselves had not indicated were being used by their college earlier in the survey.

The frequency of submissions for this question that for communication channels already in use by the college were as follows: email (85), microblogs (37), text messages (108), and SNS (36). There were an additional 37 submissions within the open-ended "other" field. Many of these entries did not indicate a communication technology, with

the highest frequency being simply comments (21) of some sort, including "N/A." Of the communication technologies submitted outside of the ones being studied, the highest frequencies were for Discord (5) and phone calls (5), followed by Canvas (4), hardcopy mail (2), and city website (1).

In addition to the survey responses, the focus group interviews allowed for the collection of qualitative data to answer the second research question, as aligned in Appendix E. Focus group interview participants were asked if there were communication technologies that they preferred that were not currently in use at their colleges. No one theme emerged from this direct question, although there were several responses that indicated a few technologies by name (presented in alphabetical order): direct human contact, Facebook messenger, Google hangouts, Marco Polo, Pronto, and telephone. The participants did not discuss any particular technology at length and immediately began moving the discussion on to the next question, offering a profusion of the characteristics they preferred, rather than the technologies themselves. One participant stated, "I don't really think that it matters what they use" as long as their preferred characteristics are maintained. A frequency analysis was developed to review these characteristics in more depth, using the same codes as used for the first research question. This analysis used the same five codes and produced 18 total frequencies. All 18 of the frequencies for this portion of the focus group were effective (18), as presented in Figure 6.

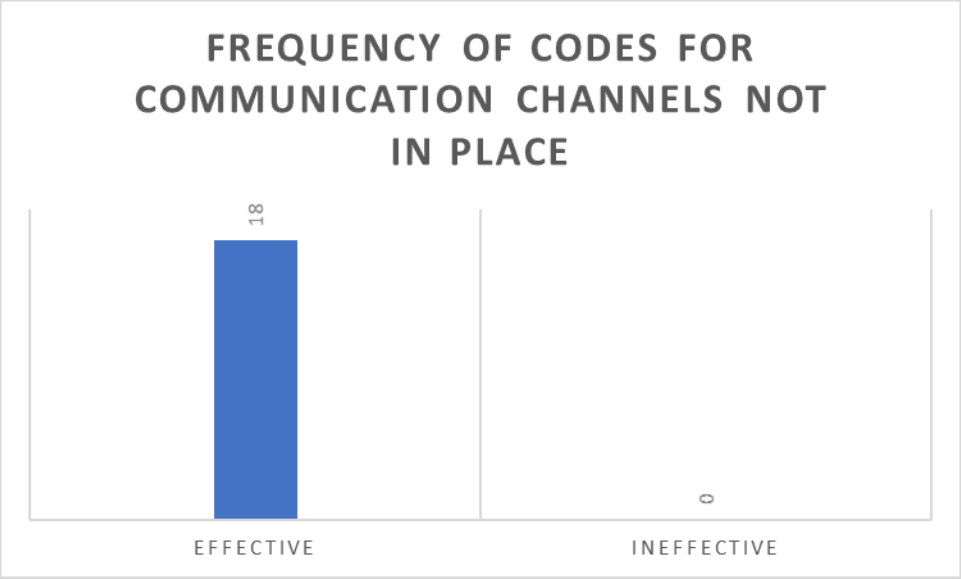

Figure 6. Frequency of codes for communication channels not in place.

The largest frequency was for Multiple Cues, with a frequency of 6, with Synchronicity and Immediacy (E) a close second with a frequency of 5. Personability (E) received 3, while both Push and Pull Technology (E) and Accessibility or Ease of Use each received a frequency of 2. A detailed review of the code frequencies is presented in Table 4. Examples of participant statements for Multiple Cues (E) included "being able to track it I think it's helpful" and "a platform that sends it, shows that it was delivered, and shows that it was read, I think, is useful." While examples for Synchronicity and Immediacy (E) included, "It's nice to be able to just you know get to that at your leisure whatever time is good for you" and "something that I can do at 2 a.m."

Table 4

Detailed Account of Code Frequencies for Communication Channels Not in Place

	Synchronicity and Immediacy		Personability		Push and Pull Technology		Accessibility or Ease of Use	Multiple Cues	*N*
	(E)	(I)	(E)	(I)	(E)	(I)			
Communication channels not in place	5	0	3	0	2	0	2	6	18

Summary

The analyses of both quantitative and qualitative data collected from the survey and focus groups resulted in key findings for each research question. For the first research question: "How do community college students perceive the effectiveness of their community college's technology channels in place for receiving information from the college," there were several key findings. Data from the survey indicated that 96% of students find the communication channels in place at their colleges to be effective overall.

Email was the most prevalently reported communication channel (frequency of 493) and was found to be the most effective communication channel in place, with 96% of students finding it effective. The qualitative data also indicated email to be effective with a frequency of 10 effective codes. Text messages, although not as prevalently used (frequency of 139), were also found to be effective by 79% of students completing the survey. Yet the qualitative data were split, with a frequency of 4 for both effective and ineffective codes.

Microblogs and SNS were less prevalent than either email or text messages, with frequencies of 27 and 89 found in the survey. Less than half of the students surveyed

found these communication channels to be effective; 46% found microblogs to be effective, while 41% found SNS to be effective. The qualitative data indicated the same, with a frequency of 4 ineffective codes for microblogs and a zero frequency for effective. SNS fared marginally better qualitatively, with a frequency of two effective codes, and three ineffective codes.

The data results also indicated key findings for the second research question, "Do community college students prefer the use of technology channels for communication that are not used by their college?" Results from the survey found that 73% of students disagreed with the statement, "I prefer to receive official college information through a communication technology channel that my college does not use." The qualitative data supported this finding as well, because no theme emerged from the focus groups for a preferred communication channel that was not in use. Finally, when the focus group participants were informed that email was indicated to be the most effective communication channel in the survey results, all participants agreed with that assessment.

Chapter IV presented the purpose statement, research questions, and the research and data collection procedures as well as reviewed interrater reliability, the population, and the sample. Additionally, a presentation and analysis of data for each research question was presented. More information on findings and conclusions can be found in the next chapter.

CHAPTER V: FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS

Overview

Chapter V begins with a review of the research study's methodology, including the purpose statement, research questions, population, sampling frame, sample, sample size, and limitations. A discussion of the major findings and unexpected findings follows. Next, the conclusions for the study are presented, combining the data analysis with the literature review. After the conclusions, the implications for action are presented, detailing steps for community colleges to take as a result of this study. Penultimately, recommendations for further research are presented. The chapter comes to a close with concluding remarks and reflections from the researcher.

Review of the Methodology

The research design selected for this study was a sequential mixed methods research design. The initial research method of an online survey was designed with closed questions to gather quantitative data. These data were then used to inform the semistructured questions applied to the focus groups, which took place after the survey was administered. The survey gathered principally quantitative data related to which communication technologies were perceived to be effective by students, while the focus groups gathered principally qualitative data, allowing for a deeper understanding of the characteristics that made each communication technology effective.

Purpose Statement

The purpose of this mixed methods study was to explore and describe the communication technologies that community college students perceive are effective ways to receive information from their college. A secondary purpose was to explore and

describe communication technology channels students perceive would be effective ways to receive information from their college that are not being used.

Research Questions

1. How do community college students perceive the effectiveness of their community college's technology channels in place for receiving information from the college?
2. Do community college students prefer the use of technology channels for communication that are not used by their college?

Population

According to McMillan and Schumacher (2010), a population is "a group of individuals, objects, or events, that conform to the specific criteria and to which we intend to generalize the results of the research" (p. 129). In addition to a population, research studies often include a target population. A target population may differ slightly than the population to which the results will be generalized, by sharing more specific characteristics than the population in its entirety (McMillan & Schumacher, 2010). The population for this study was community college students of which there are 10 million annually in the United States (Bailey & Smith Jaggars, 2015), while the target population was community college students within California, of which there are 2.1 million annually (California Community Colleges Chancellor's Office, 2021b).

Sampling Frame

A sampling frame identifies some limitations on the generalizability of a study to an entire population (McMillan & Schumacher, 2010). The sampling frame for this study was delimited to include students attending California community colleges located within the California Association of Community College Registrars and Admissions Officers

(CACCRAO) Region 4 during the 2020-2021 school year. The total student headcount for the colleges located within this region was 131,052 during the spring term of 2019 (California Community Colleges Chancellor's Office, 2019). CACCRAO Region 4 includes 13 community colleges, located within the following five counties: Alameda, Monterey, San Benito, Santa Clara, and Santa Cruz (CACCRAO Regions Map, n.d.).

Sample

For the purpose of this study, the researcher used nonprobability, purposeful sampling. In nonprobability sampling, participants are not selected at random but are chosen specifically because they represent a specific characteristic of the population, such as being a student (McMillan & Schumacher, 2010). Purposeful sampling narrows the selection of participants further, by requiring characteristics of the population they represent (McMillan & Schumacher, 2010) such as attending a specific college. The subjects for the quantitative portion of this study were selected by nonprobability purposeful sampling as students who attend either of the two specific sample colleges for this study.

Participants for the qualitative portion of this study were selected through a mixed methods sequence of sampling techniques. First, as with the quantitative sample, purposeful sampling narrowed the potential participants to those students attending one of the two colleges (McMillan & Schumacher, 2010). Then the qualitative sample was narrowed further through volunteer sampling (McMillan & Schumacher, 2010), by the act of the students supplying their contact information during the survey process if they were interested in participating in a focus group. Last, the sample was narrowed by quota sampling. Quota sampling occurs when participants are selected based on their

characteristics, until an appropriate number of participants is reached (McMillan & Schumacher, 2010). Quota sampling can be flexible to allow an anticipated number of participants to change as the study unfolds (Patton, 2015) or to satisfy an anticipated number of participants such as five students for a focus group.

Sample Size

The number of individuals participating in a study is known as the sample size (McMillan & Schumacher, 2010). For quantitative research, the sample size need not be overly large, as a small percentage of the population "can approximate the characteristics of the population satisfactorily" (McMillan & Schumacher, 2010, p. 141). For qualitative research, samples range from 1 to 40, and may seem small when generalized to a larger population (McMillan & Schumacher, 2010). However, within qualitative research sample size depends more on the information richness than the sample size itself (McMillan & Schumacher, 2010).

There are 13 colleges within CACCRAO Region 4 with a student population total over 130,000 during the spring of 2019 (California Community Colleges Chancellor's Office, 2019). The researcher used geographical proximity sampling in relation to the researcher to select two colleges within CACCRAO Region 4 from two separate counties representing nearly 23,000 students to participate in the study (California Community Colleges Chancellor's Office, 2019). For the qualitative interview focus group portion of the study, the sample size was five students from each college, for a total of 10 students identified through volunteer and quota sampling.

Quota sampling allows researchers to recruit people who meet the population sample criteria until a predetermined and specified number of people is reached (Mack et

al., 2005). The survey instrument was sent to all students, 18 years of age or older, who attended the two study participant colleges. For this study, the researcher used five students per virtual interview focus group, one group from each of the colleges participating in the study. The quota sampling criteria for participating in the interview focus group for this study were (a) to be a student attending one of the sample colleges, (b) to have participated in the online survey portion of the study, and (c) to have expressed interest in participating in a focus group by submitting their contact information at the end of the survey. Once the survey closed, the researcher had a list of students who had submitted their contact information. The researcher then used a random table of numbers to sample and contacted each student to determine whether the student was willing to participate in the focus group, could attend at the scheduled session, and was willing to submit the consent form.

Limitations

Specific elements of a study that may negatively affect the results or the researcher's ability to generalize the findings are called limitations (C. M. Roberts, 2010). Limitations unlike delimitations are typically items over which the researcher does not have control (C. M. Roberts, 2010). The limitations for this study include the sample size, the use of focus groups, the use of email as the sole communication tool with study participants, and the researcher as an instrument.

The first limitation for this study was the sample size of participating students. The community colleges selected for the study represented a particular geographical area and collectively the college student population surveyed was nearly 23,000 students. When results were generalized to the population, however, there were annually more than

2.1 million community college students within the California Community Colleges system (California Community Colleges Chancellor's Office, 2021b) and 10 million community college students nationally (Bailey & Smith Jaggars, 2015).

Another limitation was specifically within the use of focus groups. Limitations of focus groups include managing the interview so that a few individuals do not dominate the process, encouraging individuals with a minority perspective to speak up (Patton, 2015), and being unable to ensure total confidentiality (McMillan & Schumacher, 2010; Patton, 2015).

An additional limitation for this study was the sole use of email to communicate with study participants. The survey was sent out via email and study participants for the focus groups were also communicated with by email. The only communication that took place outside of email was the content of the focus groups.

The last limitation was that of the researcher as a research instrument or as the facilitator of the focus groups. When a researcher is an instrument in a qualitative study, the credibility of the study is directly linked to the credibility of the researcher (Patton, 2015). Therefore, researchers must engage in reflexive self-scrutiny, asking difficult questions of themselves to be neutral and objective (McMillan & Schumacher, 2010) throughout the qualitative research process. In addition, researchers must be mindful and enhance their self-awareness in an interview role as the interviewer may affect the interviewees and vice versa (Patton, 2015). The researcher for this study has a background in counseling and is experienced with both establishing rapport and interviewing individuals. To reduce bias, the researcher field-tested the questions,

recorded the focus group sessions, and engaged the assistance of an observer and research expert.

Major Findings

The objectives of this study were to explore and describe the communication technologies that community college students perceive are effective ways to receive information from their college and to explore and describe communication technology channels students perceive would be effective ways to receive information from their college that were not being used. The previous chapter presented an analysis of the data collected for this study. The following section is arranged by research question, presenting the major findings for each question with support from the data analysis presented in Chapter IV and the literature review presented in Chapter II.

Research Question 1

How do community college students perceive the effectiveness of their community college's technology channels in place for receiving information from the college?

Major Finding 1: Email is an effective communication channel. This study's quantitative and qualitative results indicated email to be both a pervasive and an effective communication tool between community colleges and their students. Email was the most prevalently reported communication channel out of all the channels studied and was indicated to be an effective communication tool by nearly all study participants. This finding is supported by the literature, as email is frequently used on college campuses (Ha & Dong Hee, 2014; Lancaster et al., 2007), and some studies indicate email to be favored by college students as a generalized communication channel (Chen et al., 2012; Robinson & Stubberud, 2012).

Major Finding 2: Microblogs and social networking sites (SNS) are not effective communication channels. Both microblogs and SNS were found to be less prevalent than other communication channels in use and less than half of the students surveyed found neither to be effective. Literature supports this finding since many of the communication channels that students prefer to use for social purposes may not be those they prefer to use for school-related activities (Robinson & Stubberud, 2012). SNS may be preferred to be used only as a social communication channel (Ha & Dong Hee, 2014; Robinson & Stubberud, 2012) and not for college communication.

Research Question 2

Do community college students prefer the use of technology channels for communication that are not used by their college?

Major Finding 1: Students do not prefer the use of technology channels for communication that are not used by their college. The majority of community college students prefer the use of technological communication channels that are currently used by their college. Study results did not indicate a student preference for any single specific technological communication channel outside of those studied. This finding is supported by the literature, as research indicates students use email prevalently (J. Johnson, 2021; Lancaster et al., 2007; Tankovska, 2021) and text frequently (Emanuel, 2013; Pettijohn et al., 2015), both of which the research indicated were in use by the colleges. Other communication channels studied, such as microblogs and SNS, were also in use by the colleges, and although students' perceived effectiveness was not as high, they did acknowledge the channels were in use.

Unexpected Findings

Unexpected findings are unanticipated findings that may come as a surprise (C. M. Roberts, 2010). These types of findings may be unanticipated results or provide insight to an uncontrolled variable. Two unexpected findings emerged from this study.

Unexpected Finding 1: Communication Channels in Use Are Effective

Community college students perceive the communication channels in use at their colleges to be effective overall, as evidenced by the qualitative survey results, which indicated that 96% of the students found the communication channels in use to be effective. This finding was unexpected as some authors believe that colleges fail to use an acceptable type of technology to communicate with their students or at least may need to reevaluate the manner in which the communication is used or for what purpose (Annan-Coultas, 2012; Ha & Dong Hee, 2014; Taylor & Steele, 2014; Waycott et al., 2010). Other authors agreed that many higher education institutions are ill or underprepared to handle the growing technological demands of students such as making mobile services available (Lum, 2012; Pirani & Sheehan, 2009).

Unexpected Finding 2: The Effectiveness of Text Messages May Be Limited

Multiple studies indicated text messaging or instant messaging to be both a popular form of communication with college students (Chen et al., 2012; Emanuel, 2013) and a common communication tool. As stated in the literature review, the prevalence of texting is so high that many students text whether out of boredom, for work, or in response to incoming text messages while in class, even within classrooms where explicit no cell phone use policies are prescribed (Emanuel, 2013; Pettijohn et al., 2015). However, although college students may use text messages frequently for communication

purposes, this study found that the effectiveness of text messages for official college communication may also come down to individual student preference and whether the need to be contacted with such urgency was justified or not.

The study's survey results indicated that 79% of students found text messages to be effective, but 21% disagreed to some degree. The focus group results were more mixed, however, with an equal number of effective and ineffective codes. Study participants stated the positive side of text messages as "works well, because you get to receive the message you know almost instantly," and if used in emergencies, "Something happened on campus maybe some suspicious activity in a text message gets sent out and you usually get it, you know right there and then that's effective." Study participants also noted that "the downside is that it can be a little bit intrusive," stating that some organizations "that just send out texts continuously that are not personalized and then as soon as that happens, I just completely, you know, start ignoring that or block that level of communication."

Conclusions

The major findings from this study were used to form conclusions of how community college students perceive the effectiveness of the communication channels used by their colleges. These conclusions incorporate both the major findings and support from the literature. The following conclusions align with both of the research questions.

Conclusion 1: Students Are Not Dissatisfied

Community college students find the existing communication channels to be effective, and although they may be willing to adopt a new communication technology,

they do not find the communication technologies already in use to be inherently ineffective. So while colleges are faced with rapidly increasing technology cycles (Junco, 2014; Phelan, 2016) and increased pressure to adopt new innovative applications (Bajt, 2011; Taylor & Steele, 2014), their students may not be ready to leave core communication channels behind.

Conclusion 2: Email Is Still Considered a Standard

Communication technologies are created at a fast pace, and while some remain, many disappear after a short amount of time. In spite of these many emerging technologies, email use is so prevalent, it is virtually the most common activity performed online (Kushlev & Dunn, 2015). As a mainstream element of the online experience, email accounts are required for nearly any type of online experience (The Radicati Group, 2017). Consequently, email has demonstrated a lasting presence, college students find it to be effective as indicated in this study and others (Ha & Dong Hee, 2014), and it therefore should be considered a standard communication channel.

Conclusion 3: Microblogs and SNS Are Not the Answer

In spite of the popularity of microblogs and SNS, college students are not ready to leave behind core communication channels in favor of these newer communication channels. As researchers continue to examine student and college communication with these tools and how they may be used in a college setting, students continue to prefer the use of these social media tools for social settings (Ha & Dong Hee, 2014; Robinson & Stubberud, 2012). Innovation within communication channels remains important, yet expanding into microblogs or SNS, even when considering newer generations, is not the answer.

Implications for Action

The findings from research studies have practical implications as well (C. M. Roberts, 2010). Implications for action, stemming from the conclusions for this study, are presented in this section. These implications for action should be used by constituents to make improvements in community college communication.

Implication for Action 1: Colleges Should Not Leave Email Behind Anytime Soon

The use of email has reached epic proportions across the globe as the daily amount of emails exchanged is anticipated to grow to 376 billion by the end of 2025 (J. Johnson, 2021). This study's findings, along with the results of other studies, indicate that students find email to be effective (Chen et al., 2012; Ha & Dong Hee, 2014). Part of email's appeal may be that it is not new, having been created in the 1970s, and therefore has proven to be not as transient as many newer technologies in use today.

It should also be noted, however, that email has evolved greatly since its inception. Originally email was a lean medium, including only plain text and asynchronous correspondence (Huang et al., 2006) while today email's synchronicity has greatly improved in part due to the use of mobile devices (Park & Sundar, 2015). The content of emails virtually has no limitations with the ability to add a myriad of fonts, texts, graphics, hyperlinks, attachments, videos, and so forth.

This is not to imply that email is perfect, because the study's qualitative results also indicated challenges associated with email, which should not be ignored. Therefore, colleges should examine their use of email with their students to identify areas for improvement. Suggested items for review include being careful to avoid spamming their students, ensuring that the information colleges are trying to convey is timely, needed,

and valued by the student, and that emails are sent with intention and purpose rather than creating static noise.

Implications for Action 2: Colleges Should Stop Looking for the Magic Bullet

To stay abreast of what students' needs are, colleges should continually assess their students' communication needs, interests, and technology adoption trends (Junco & Timm, 2008; Taylor & Steele, 2014). However, colleges that are scrambling to keep up or searching for the next best thing may not need to keep looking. Different types of communication technologies have been heralded as what colleges should adopt, yet the core communication channels explored in this study are perceived as effective by students. Study results did not indicate a student preference for any single specific technological communication channel outside of those studied. If colleges are using these communication channels already, they should turn to reviewing the manner in which they are using them and investigate ways to improve their current use, rather than seeking the adoption of a new technology to solve current challenges.

Implications for Action 3: Colleges Need to Create Communication Plans

Colleges need to focus on the content of their messages and how they relate to their students and their students' needs rather than searching for a new communication platform. Technology may be viewed as a valuable communication tool to deliver information, but students must also feel engaged for any communication method to be as successful (Booth & Esposito, 2011; Prensky, 2005; Tierney, 2014). Colleges need to ensure that the content they are communicating is of value to the students, is written in a manner that makes sense to students, and avoid overlapping or repetitive messages from multiple departments at once. Creating a comprehensive communication plan allows

colleges to audit their communication strategies, review the use of different communication channels, and make necessary changes to increase the effectiveness of their communication.

Implications for Action 4: Colleges Need to Use Social media Wisely

Colleges should not look to move official student communication into the social media space. Although some authors have stated that social media allows colleges to meet students in the digital space (Blumenstyk, 2015), some types of social media, especially microblogs and SNS may be better used for social purposes. Therefore, social media still has a place in college communications, yet colleges should consider how and when to use social media when communicating with students. Microblogs and SNS are more effective for social, informal occasions about the college rather than for communicating directly with students.

Recommendations for Further Research

Based on this study's findings, areas of further exploration have come to light, indicating where more research is needed to further explore community-college to community-college-student communication. This section identifies specific areas where additional research would benefit the higher education community. Future research has the opportunity to expand the reach of this initial study.

Research Recommendation 1: Email as a Communication Tool

The literature indicated that email will be a communication tool well into the future, with email users expected to exceed 4.6 billion by the end of 2025 (Tankovska, 2021). With the future of email seemingly secure, further research is needed to determine how community colleges can increase the effectiveness of this tool. Specifically, further

qualitative research should investigate student preferences for what type of information colleges should communicate through email, the preferred frequency of how often emails should be sent out, and if students prefer emails to be sent to their personal email accounts or the email accounts provided by college districts. Additionally, community college students are quick to point out challenges associated with email. Further qualitative research should explore and identify what these challenges are in greater depth as well as explore solutions for community colleges to implement in order to decrease the negative impact of those challenges.

Research Recommendation 2: Equity Considerations for Technology-Based Communication Tools

The digital divide in some cases may now have shifted to an equity divide within the use of technological communication channels. Many students from disproportionately impacted populations are unable to access technology on a broad spectrum from obtaining consistent internet service to the devices themselves. Closing this divide is more important now than ever, because obtaining a college degree is viewed as an economic necessity versus an opportunity, much like a high school diploma once was viewed (Bailey & Smith Jaggars, 2015).

This study did not collect demographic data on the study participants other than that they were 18 years of age or older. It is recommended that further research explore communication channel effectiveness perceptions through an equity-based lens by duplicating both the quantitative and qualitative methods of this study with the addition of specific demographic data. Exploring differences in effectiveness perceptions across socioeconomically disadvantaged, historically underrepresented, and specific ethnic or

racial student populations to ensure effective communication tool usage across entire college student populations would be appropriate.

Research Recommendation 3: Quantitative Exploration of the Functionality of Communication Channels

Study participant results from the qualitative portion of this study indicated specific functionality aspects of different communication channels not currently in use by their colleges that the students found effective and appreciated. Although no single specific communication channel was found as a theme, certain traits or desired functionality did emerge. For example, one participant mentioned, "To have a platform that sends it, shows that it was delivered, and shows that it was read, I think, is useful." These specific desired traits should be researched from a quantitative standpoint as well to gather additional functionality traits and to see if the results of this study hold true within a larger population.

Research Recommendation 4: Community College Needs Versus Community College Student Needs

This study focused on the effectiveness of technological communication channels used by the colleges, and the community college students' perceptions of those communication channels. Further research is needed to determine what kind of communication content is needed by community college students to increase community college student success. Regardless of the communication channel, colleges should explore what type of information students are interested in receiving in addition to the information the colleges feel students should receive.

Research Recommendation 5: Expanding to Other Colleges

This study examined community colleges and their students within CACCRAO Region 4, a specific collegiate region within the California Community Colleges system. However, with 116 colleges, 72 centers, and 73 districts, as well as more than 2.1 million students within the California Community Colleges system (California Community Colleges Chancellor's Office, 2021b), there is ample room to expand this research regionally. Further research should seek out differences in topography, regional socioeconomic status, and differences in urban/rural and dense/sparse populations to explore any potential themes that may emerge.

Research Recommendation 6: Expanding to Dual Enrollment

Many California community colleges offer dual enrollment programs allowing students who are still in middle school or high school to simultaneously attend community college classes. In the fall of 2019, more than 100,000 dual enrolled students studied at a California community college (California Community Colleges Chancellor's Office, 2021a). For this study, research participants were limited to community college students who were 18 years of age or older. Further research should be conducted to explore whether students who are still attending middle school or high school share the same preferences and perceptions as older community college students. As more and more colleges begin to offer instruction in the K-12 setting, it is important to begin an effective communication relationship with these younger students to ensure a smooth transition from high school to community college when the students graduate.

Concluding Remarks and Reflections

The main purpose for this mixed methods qualitative study reads as follows: To explore and describe the communication technologies that community college students perceive are effective ways to receive information from their college. For the researcher, the need for this study was rooted in two desires. First to explore an avenue related to student success, and second, to offer insight for community college leaders as to the real story behind student communication preferences.

Community colleges face pressure from society at large, policy leaders, and application vendors to adopt the latest and greatest communication technologies to increase engagement with their students. Adds and vendor pitches herald their products as the solution to all college communication needs, proclaiming their products to be what students desire. Yet, little research is done to verify what student preferences really are. Therefore, this study was needed to provide insight into student preferences for college leaders to consider before blindly adopting technology in reaction to these pressures.

After conducting this study, it is apparent that colleges are not missing the mark as much as they think they might be when it comes to technological communication channel selection. It is true that colleges are not known for moving nimbly, while community college students adopt new technologies at a fast rate (Rogers, 2003; Taylor & Steele, 2014). Yet while technologies are presented at a horrendous pace, not all of them are here to stay and are quite transient.

Student behavior is still indicative of a communication gap between colleges and their students. However, this gap is less likely due to community college leaders' choices of technology-based communication channels than because of how these communication

tools are used and the content transferred. The research conducted in this study indicates that the use of core communication channels, combined with consistent application and personalized, intentional content, are stronger paths forward than the adoption of new experimental communication technologies.

For the researcher, this comes as a relief. Not only are colleges reaching their students, their students are also listening. This means colleges need to make a shift from seeking new communication technologies to seeking better ways to connect with their students through their existing communication channels. It also serves as an important reminder to all, reiterating that colleges should never underestimate seeking out their students' voices and involving them in feedback activities to inform continuous college improvement cycles.

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APPENDICES

APPENDIX A

Synthesis Matrix

Reference	student interest	staff/faculty interest	foundation/ stats	mobile and cell phones	apps	social media and tech	learning	student services	state of college	media richness theory	communication	college challenges	generational items
Amirault, R. J. (2015)												x	
Annan-Coultas, D. (2012)	x		x						x				
Armengol, X., Fernandez, V., Simo, P., & Sallan, J. M. (2017)													
Bailey, T. R., & Smith Jaggars, S. (2015)			x					x	x				
Bajt, S. K. (2011)	x								x				
Bartkovich, J. (2011)												x	
Baym, N. K. (2015)	x			x	x	x							
Blumenstyk, G. (2015)	x	x	x						x			x	
Boggs, G. R., & McPhail, C. J. (2016)												x	
Booth, M., & Esposito, A. (2011)	x					x	x	x					
California Community Colleges Chancellor's Office (2012)			x						x				
California Competes. (2012)			x										
California State University Budget Office. (2016)			x										
Carlson, J. R., & Zmud, R. W. (1999)										x			
Carlson, S. (2005)													x

Castleman, B.L., & Page, L. C. (2016)	x							x					
Chen, C. C., Jones, K. T., & Xu, S. (2012)	x					x							
Cheong, P. H., Shuter, R., & Suwinyattichaiporn, T. (2016)	x	x		x			x					x	
Clark, M., Fine, M. B., & Scheuer, C.-L. (2017)	x					x							
Community College League of California. (2015)			x										
Daft, R. L., & Lengel, R. H. (1986)										x			
Daft, R. L., Lengel, R. H., & Trevino, L. K. (1987)										x	x		
DeGroot, J. M., Young, V. J., & VanSlette, S. H. (2015)		x				x						x	
DeTienne, K. B. (2002)						x					x		
Emanuel, R. C. (2013)	x		x	x									
Ferreira, J. B., Klein, A. Z., Freitas, A., & Schlemmer, E. (2013)	x			x			x						
Foundation for California Community Colleges Retrieved February 4, 2018			x										
Fried, S., Esch, C., & Supinger, A. (2017)			x						x			x	
Friedrich, R., Peterson, M., & Koster, A. (2011)													x
Gordon, M. E. (2014)			x	x	x	x							
Grant, D. M., Malloy, A. D., &	x					x	x						

Murphy, M. C. (2009)													
Guri-Rozenblit, S. (2009)			x										
Ha, J., & Dong Hee, S. (2014)	x					x	x						
Herndon, M. C. (2011)	x		x										
Hirsch, W. Z., & Weber, L. (1999)											x	x	
Huang, A. H., & Yen, D. C. (2003)						x				x			
Huang, A. H., Hung, S.-Y., & Yen, D. C. (2006)						x				x			
Isaacson, W. (2014)						x					x		
Jacquemin, S. J., Smelser, L. K., & Bernot, M. J. (2014)	x	x			x	x							
Jenkins, D. (2009)			x						x				
Jennifer Ma, & Sandy Baum. (2016)			x						x				
Johnson, H., Cuellar Mejia, M., & Bohn, S. (2015)			x										
Jones, C., Ramanau, R., Cross, S., & Healing, G. (2010)													x
Junco, R. (2014)	x					x		x	x		x	x	
Junco, R., & Cole-Avent, G. A. (2008)	x	x		x	x	x		x			x	x	
Junco, R., & Timm, D. M. (2008)	x					x		x					
Kahai, S. S., & Cooper, R. B. (2003)										x			
Kishi, M. (2008)						x				x			
Kowalik, E. (2011)	x					x							
Kraushaar, J. M., & Novak, D. C. (2010)	x						x	x				x	
Ku, Y.-C., Chu, T.-H., & Tseng, C.-H. (2013)						x				x			
Kumar, N., & Sharma, S. (2016)						x							

Kushlev, K., & Dunn, E. W. (2015)	x					x							
Kvavik, R. B. (2005)	x					x							
Lan, Y.-F., & Sie, Y.-S. (2010)				x		x				x	x		
Lancaster, S., Yen, D. C., Huang, A. H., & Shin-Yuan, H. (2007)	x			x		x					x		
Ledbetter, A. M., & Finn, A. N. (2016)	x	x					x						
Legislative Analyst's Office. (2016)			x						x				
Lengel, R. H., & Daft, R. L. (1988)										x	x		
Levine, A., & Dean, D. R. (2012)												x	x
Lo, S.-K., & Lie, T. (2008)										x			
Lowe, B., & Laffey, D. (2011)						x	x						
Lu, Y., Kim, Y., Dou, X., & Kumar, S. (2014)										x			
Lum, L. (2012)	x		x	x	x								
Maity, M., Dass, M., & Kumar, P. (2018)										x			
Margaryan, A., Littlejohn, A., & Vojt, G. (2011)	x	x							x				
Mary Ellen Gordon. (2014)					x								
McEwan, B. (2011)	x					x							
Morreale, S., Staley, C., Stavrositu, C., & Krakowiak, M. (2015)	x										x		
Munter, M. (2012)											x		
MySpace. (2014)						x							
National Center for Education Statistics. (2016)			x										
Nevarez, C., Wood, J. L., & Penrose, R. (2013)									x			x	

Newberry, B. (2001)						x							
Oakley, E. O. (2017)			x						x				
Oblinger, D. G., & Hawkins, B. L. (2005)													x
Palvia, P., Pinjani, P., Cannoy, S., & Jacks, T. (2011)										x			
Park, E. K., & Sundar, S. S. (2015)				x							x		
Perna, L. W. (2014)			x						x				
Pettijohn, T. F., Frazier, E., Rieser, E., Vaughn, N., & Hupp-Wilds, B. (2015)	x			x									
Phelan, D. J. (2016)			x						x			x	
Pirani, J. A., Sheehan, M. C., & Educause. (2009)			x	x									
Prensky, M. (2005)	x												
Prensky, M. (2009)	x	x	x										
Radford, A. W., Berkner, L., Wheeless, S. C., Shepherd, B., & National Center for Education, S. (2010)			x										
Radicati Group, The (2017)						x							
Ramage, T. (2011)	x					x		x				x	
Roberts, G. R. (2005)													x
Robinson, S., & Stubberud, H. A. (2012)	x			x	x	x						x	
Rockmann, K. W., & Northcraft, G. B. (2008)										x			
Rowley, D., Lujan, H., & Dolence, M. (1997)									x			x	
Saat, R. M., & Selamat, M. H. (2014)										x			
Safier, R. (2015)									x				

Safko, L., & Brake, D. K. (2009)			x		x	x							
Salas, G., & Alexander, J. S. (2008)	x												
Schmitz, J., & Fulk, J. (1991)										x			
Sevillano-García, M. L., & Vázquez-Cano, E. (2015)				x	x		x						
Smith, A., & Anderson, M. (2018)						x							
Taylor, J., & Steele, R. (2014)	x							x					
The White House: Office of the Press Secretary. (2015)			x						x				
Tierney, W. G. (2014)							x	x			x		x
Treat, T. (2011)									x			x	
Udochukwu Njoku, C. P. (2015)	x	x											
University of California Infocenter. (2016)			x										
Vázquez-Cano, E. (2014)	x			x	x		x						
Wankel, C., & Wankel, L. A. (2011)	x	x				x	x						
Wankel, L. A., & Blessinger, P. (2013)	x	x		x			x						
Waycott, J., Bennett, S., Kennedy, G., Dalgarno, B., & Gray, K. (2010)	x	x											
Weaver, A. C., & Morrison, B. B. (2008)						x							
Weaver, K. (2011)	x	x				x							
Weiland, S. (2014)													x
Yu, T.-K., Lin, M.-L., & Liao, Y.-K. (2017)										x	x		
Zappavigna, M. (2012						x							

APPENDIX B

Community College Student

Communication Technology Channel Preference Questionnaire

The goal of this 5 minute questionnaire is to allow community colleges to better understand the communication preferences of their students. Please answer the questions according to your own preferences, rather than what you think might be a popular answer. All responses are confidential and only the final data statistics will be shared.

1. My college uses the following communication technology channels to send out official college information: (please mark all that apply)
   - o email
   - o microblogs
   - o text or instant messages
   - o social networking sites
   - o other

2. The communication technology channels my college uses are effective communication tools for receiving official college information.

Strongly agree Agree Disagree Strongly disagree

3. Email is an effective communication technology to receive official college information.

Strongly agree Agree Disagree Strongly disagree

4. Microblogs are an effective communication technology to receive official college information. (Example: Twitter, Instagram or Snapchat)

Strongly agree Agree Disagree Strongly disagree

5. Text or instant messaging is an effective communication technology to receive official college information. (Example: cell phone text message or instant message app such as WhatsApp)

Strongly agree Agree Disagree Strongly disagree

6. Social networking sites are an effective communication technology to receive official college information. (Example: Facebook or MySpace)

Strongly agree Agree Disagree Strongly disagree

7. I prefer to receive official college information through a communication technology channel that my college does not use.

Strongly agree Agree Disagree Strongly disagree

8. If you prefer communication technology channels that your college does not use, what are they? Please mark all that apply.

- email
- microblogs
- text or instant messages
- social networking sites
- other

APPENDIX C

Alignment of Research Questions and Questionnaire Questions

Research Question	Corresponding Questionnaire Question(s)
How do community college students perceive the effectiveness of their community college's technology channels in place for receiving information from the college?	1. My college uses the following communication technology channels to send out official college information: (please mark all that apply) 2. The communication technology channels my college uses are effective communication tools for receiving official college information. 3. Email is an effective communication technology to receive official college information. 4. Microblogs are an effective communication technology to receive official college information. (Example: Twitter, Instagram or Snapchat) 5. Text or instant messaging is an effective communication technology to receive official college information. (Example: cell phone text message or instant message app such as WhatsApp) 6. Social networking sites are an effective communication technology to receive official college information. (Example: Facebook or MySpace)
Do community college students prefer the use of technology channels for communication that are not used by their college?	7. I prefer to receive official college information through a communication technology channel that my college does not use. 8. If you prefer communication technology channels that your college does not use, what are they? Please mark all that apply.

APPENDIX D

Focus Group Interview Protocol

Hello everyone, and welcome. My name is Nicole Dunne and I work as an administrator at a community college, within the area of student services. I am also a doctoral student at Brandman University in organizational leadership. I am interested in how colleges communicate to students and how we might be able to improve the communication pipelines colleges use to inform their students. In order to answer my research questions, I am engaging in research at your school; including an online survey and this focus group to hear about students' preferences. Your participation will allow me to capture student voices in this area.

I would like to extend my sincere thanks to each of you for being here today. Without your participation this type of research would not be possible. So, thank you!

As I conduct the focus group interview, I will be reading much of what I say. This is done to ensure that the process is as closely duplicated as possible, and follows research guidelines for working with human subjects.

Informed Consent
Any information that is gathered in connection with this study will remain confidential. None of the data will reference individuals or specific colleges. To be able to participate today you must have reviewed, signed and sent me your informed consent form, as well as reviewed the Brandman Bill of Rights. Does anyone have any questions about those documents?

I will be recording this session, as outlined in the Informed Consent form. I have scheduled an hour for our focus group. Each of your responses is important to me, yet may be difficult to hear if we all speak at once. Please feel free to respond to my questions by unmuting your microphone. If someone else is already speaking, please wait to speak, raise your hand to be called on next, or type a response in the chat box. As the facilitator it will be my job to ensure that everyone has a chance to respond to each question. Agreeing or disagreeing with your colleagues is entirely appropriate and welcomed, as long as there is polite treatment of everyone. Anyone displaying inappropriate behavior, such as asking in appropriate questions, using profane language, or raising their voice may be asked to leave, and may be banned from our virtual platform.

Before we begin, I would like us to have a common understanding of a few terms that will come up today.

The overarching theme for this study is communication between you and your college. What this looks like may be different or similar to other communications, such as between you and your friends, or between you and your relatives. Please keep this communication relationship, between you and your college, in mind as you answer the following questions.

The other common understanding is of the word characteristic. Characteristics, are generally defined as traits, or qualities, that helps to identify or distinguish the item from something else.

Does anyone have any final questions before we begin? Alright, let's begin.

1. Please share with me the characteristics that make email either an effective or ineffective communication tool for your college to use when communicating with you.

Possible probe: Which traits make you prefer or not prefer email?

2. Okay, so that was email. Now, can you please share with me the characteristics that either make microblogs an effective or ineffective communication tool? Some examples of microblogs are Twitter, Instagram, and Snapchat.

Possible probe: Which features of a microblog really work or really don't work for school related material?

3. Great, thanks everyone. Now how about texting or instant messaging? Please share with me the characteristics that make texting through your cell phone or instant messaging through an app either an effective or ineffective communication tool for your college to use when communicating with you.

Possible probe: What makes a text message effective or ineffective?

4. Okay, moving on. Let's talk about social networking sites. Examples of social networking sites are Facebook or MySpace. Please share with me the characteristics that make social networking sites either an effective or ineffective communication tool for your college to use when communicating with you.

Possible probe: Which features do you appreciate? Which features do you not care for? And why is that?

5. We've spoken about quite a few communication technologies today. Are there are any communication channels that you would prefer your college use, but are not currently being used?

Possible probe: perhaps some of the communication tools we have already spoken about are your preference and are not being used at your school?

6. Okay. For those of you who may have mentioned a communication channel preference not currently in place, can you share with me the characteristics that make it your preferred way to be communicated to?

Possible probe: What is it about this communication channel that would make it a great tool to be used when communicating with you?

Anticipated conclusion question to be determined by quantitative survey results:
7. A survey was previously sent out to the students at your school. The survey results listed _____ as the most preferred communication channel at your college. Please share with me why you agree or disagree with those results. (The blank space is anticipated to be filled based on the survey results from the quantitative survey administered to the college prior to the focus group.)

Those are all the questions I have for you today and so concludes our focus group interview. I truly appreciate your participation and your willingness to help this study move forward. If you find you have questions or concerns after this meeting, please do not hesitate to contact me at ndunne1@mail.brandman.edu.

APPENDIX E

Alignment of Research Questions and Focus Group Questions

Research Question	Corresponding Focus Group Question(s)
How do community college students perceive the effectiveness of their community college's technology channels in place for receiving information from the college?	1. Please share with me the characteristics that make email either an effective or ineffective communication tool for your college to use when communicating with you. Possible probe: Which traits make you prefer or not prefer email? 2. Okay, so that was email. Now, can you please share with me the characteristics that either make microblogs an effective or ineffective communication tool? Some examples of microblogs are Twitter, Instagram, and Snapchat. Possible probe: Which features of a microblog really work or really don't work for school related material? 3. Great, thanks everyone. Now how about texting or instant messaging? Please share with me the characteristics that make texting through your cell phone or instant messaging through an app either an effective or ineffective communication tool for your college to use when communicating with you. Possible probe: What makes a text message effective or ineffective? 4. Okay, moving on. Let's talk about social networking sites. Examples of social networking sites are Facebook or MySpace. Please share with me the characteristics that make social networking sites either an effective or ineffective communication tool for your college to use when communicating with you. Possible probe: Which features do you appreciate? Which features do you not care for? And why is that?

Do community college students prefer the use of technology channels for communication that are not used by their college?	5. We've spoken about quite a few communication technologies today. Are there are any communication channels that you would prefer your college use, but are not currently being used? Possible probe: perhaps some of the communication tools we have already spoken about are your preference and are not being used at your school? 6. Okay. For those of you who may have mentioned a communication channel preference not currently in place, can you share with me the characteristics that make it your preferred way to be communicated to? Possible probe: What is it about this communication channel that would make it a great tool to be used when communicating with you?
Anticipated Follow Up Question	7. A survey was previously sent out to the students at your school. The survey results listed _____ as the most preferred communication channel at your college. Please share with me why you agree or disagree with those results. (The blank space is anticipated to be filled based on the survey results from the quantitative survey administered to the college prior to the focus group.)

APPENDIX F

Brandman University Institutional Review Board Approval

BRANDMAN University

Nicole Dunne <ndunne1@mail.brandman.edu>

BUIRB Application Approved As Submitted: Nicole Dunne

Institutional Review Board <my@brandman.edu> Fri, Mar 5, 2021 at 7:34 AM
Reply-To: webmaster@brandman.edu
To: ndunne1@mail.brandman.edu
Cc: ddevore@brandman.edu, buirb@brandman.edu, vsmithsa@brandman.edu

Dear Nicole Dunne,

Congratulations, your IRB application to conduct research has been approved by the Brandman University Institutional Review Board. This approval grants permission for you to proceed with data collection for your research. Please keep this email for your records, as it will need to be included in your research appendix.

If any issues should arise that are pertinent to your IRB approval, please contact the IRB immediately at BUIRB@brandman.edu. If you need to modify your BUIRB application for any reason, please fill out the "Application Modification Form" before proceeding with your research. The Modification form can be found at the following link: https://irb.brandman.edu/Applications/Modification.pdf.

Best wishes for a successful completion of your study.

Thank you,
Doug DeVore, Ed.D.
Professor
Organizational Leadership
BUIRB Chair
ddevore@brandman.edu
www.brandman.edu

APPENDIX G

Questionnaire Email to Students

Dear Student,
[**Name of college**] is interested in hearing from you! You have been selected to participate in a study that is researching the communication between colleges and their students. The goal of this important research is to help colleges and universities to understand student communication preferences.

To better understand the communication preferences of college students a brief survey has been created. The survey is optional and confidential. To complete the survey, please follow this link directly, or copy and paste it into an internet browser: [**internet link here]**.

The survey is open to all [**name of college**] students age 18 or older, and will close on **[insert date of closure here**]. For more information about the survey please visit: [**internet link here**]. If you have any questions, please contact Nicole Dunne at ndunne1@mail.brandman.edu.

We look forward to hearing from you.

Sincerely,

[**College Entity sending out email**]