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Faculty adaptation to emerging instructional technologies in higher education

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FACULTY ADAPTATION TO EMERGING INSTRUCTIONAL TECHNOLOGIES IN HIGHER EDUCATION

by

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Abstract

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This study examined how and why faculty adopt podcasting as an instructional technology tool in their teaching. Podcasting is an instructional technology tool being used for teaching and learning in higher education. Faculty may record lectures with audio, video, and/or PowerPoint slides to instruct students on class material. Students may access podcasts at their convenience through various devices, including mobile devices and computers. Research has shown that students who use podcasts to study for tests tend to perform more successfully on tests. This study was a qualitative multiple case study of seven California community college faculty using podcasting as an instructional technology in their teaching. Email and telephone interviews were conducted to obtain data for this study. Rogers' diffusion of innovations theory, and specifically the perceived attributes of innovation and their rate of adoption, was the theoretical framework used in this study to help explain how faculty develop attitudes and behavior toward podcasting as a teaching tool in higher education and to provide a context for faculty adoption of podcasting as a teaching tool in higher education. This study revealed seven themes that informed how and why faculty adopt podcasting in their teaching, as well as constraints to adopting podcasting. The seven themes identified in this research using Rogers' perceived attributes of diffusion of innovations framework and their rate of adoption (PADIRA)

are: (a) Apprehension, (b) Flexibility, (c) Organization, (d) Personal Gratification, (e) Student Outcomes, (f) Technological Capacity, and (g) Training. Given the demonstrated potential of podcasting technology for enhancing teaching and learning, this study of perceived benefits and constraints faced by California community college instructors when adopting podcasting in their classroom teaching has provided insights into instructional technology adaptation issues in higher education.

TABLE OF CONTENTS

LIST OF TABLES

Table

Chapter 1: Introduction

Technology is now an essential part of college students' experience. It is estimated that 87% of college students use laptops/notebooks weekly to complete college coursework (Pearson Education, 2015), and 67% of online college students use mobile devices, such as smartphones or tablets, to complete online class assignments (Magda & Aslanian, 2018). The rise of technology use in colleges has collided with the traditional nature of higher education and has pushed forth faster changes in educational reform (Black, 2010; DeNoyelles, Raible, & Seilhamer, 2015). Colleges and universities in the United States are built on traditions that encourage both a continuation of and reliance on those traditions, which results in organizational consistency that may slow educational reform (Cuban, 2001; Van Dusen, 1997). Due to technological advances of the 20th and 21st centuries, educational reform has accelerated to meet the demands of a rapidly changing society and student body (Black, 2010). Sixty-six percent of college students have used a digital textbook—an e-textbook—in a college class, which suggests a need to examine different uses of technology in teaching and learning (DeNoyelles & Raible, 2017). Podcasts are one type of tool that allow a teacher to record specific lectures or materials for students (DeNoyelles et al., 2015). Furthermore, technology's impact on students' education has led to the assertion that students in the 21st century depend on technology (Black, 2010). Higher education continues to face new challenges. Technology use is expected to increase among college students in the future. Among the different sectors of higher education, community colleges will be on the frontline of these technology advances, since 45% of all college students in the United States attend community colleges (American Association of Community Colleges [AACC], 2016). A greater percentage of college students are expected to attend community colleges in the future given former President Obama's efforts to provide

students with 2 years of tuition-free education at community colleges (The White House, 2016). Although Obama's free community college initiative was abandoned by President Donald Trump, local and state governments have increased funding for some form of free community college education (Brownstein, 2017; Vyse, 2017).

According to Cohen, Brawer, and Kisker (2013), community colleges are now accessible and affordable to students nationwide. Also, a college education will increasingly be a requirement for employment opportunities that lead to higher wages and income stability. Carnevale, Smith, and Strohl (2013) reported that, in 2020, a bachelor's degree will be required for 24% of all employment opportunities, and an associate degree will be required for 12% of all employment openings. Additionally, technology is becoming increasingly important in educating today's college students because it is changing how faculty teach and how students learn (Saunders, 2014; Sweet, Sweet, & Fedel, 2013). This is a compelling argument for community college faculty to adapt to the changing needs of teaching and learning.

Background

Education has historically been very traditional, doing things about the same way things were done in the previous generation (Cuban, 2001; Van Dusen, 1997). However, recently, there has been a focus on educational reform by training students in the use of emerging technologies because technology skills will be required for jobs in the future (Sweet et al., 2013). The effect of technology on students' education is notable because today's generation of students has grown up in the Internet age and tend to be comfortable using computers for class work (Pearson Education, 2015). Prensky (2001) described these students as "digital natives" who tend to be well versed in the Internet and modern technology. Technology can help facilitate student learning by making it easier for students to complete their assignments (Pearson Education,

2015); however, one challenge is that not all students have equal access to technology (M. G. Brown, Wohn, & Ellison, 2016; Organisation for Economic Co-operation and Development [OECD], 2015; Palloff & Pratt, 2013; Robinson et al., 2015; Ryan & Bagley, 2015; Wei, 2012; Williams van Rooij & Zirkle, 2016). Identifying and using technological tools that are widely accessible to students requires integrating tools that students may use in other areas. One such tool is the podcast.

Higher education institutions have a vested interest in providing faculty with adequate technology training, support, and resources to help faculty decide whether adoption of an effective instructional technology in their teaching can improve teaching and student learning. Instructional technology training for faculty can influence faculty adoption of technologies (Agbonlahor, 2006; Jacobsen, 1997; Palloff & Pratt, 2013). Research has shown that the more faculty members attend IT-related training courses, the more they tend to adopt technology in their teaching (Agbonlahor, 2006; Palloff & Pratt, 2013). Also, technology training is most useful when it demonstrates how faculty can effectively use the technology in their teaching (Spotts, 1999).

In the past, some faculty members may have felt threatened by technology as an infringement on their independence. Higher education institutions should be aware of faculty apprehension toward change and provide faculty with technology support workshops and training (McNaught, 2003; Palloff & Pratt, 2013). C. Roberts (2008) expounded that, in the past, several factors influenced faculty adoption and implementation of technology, including student interest and competitive advantage, faculty technology competence, and institutional and organizational culture. Others have promoted careful introduction of education technology into academia (Palloff & Pratt, 2013).

Another consideration is that educational organizational changes sometimes create adverse faculty responses due to an unsupportive institution and less collegial directives (McNaught, 2003). McNaught (2003) recommended that educational change be framed and executed in a way that supports faculty and engages faculty input. Furthermore, faculty should enjoy a collegial university culture that empowers faculty with a role in governance (American Association of University Professors [AAUP], 1940). Faculty participation in governance should provide faculty with a voice in any proposed changes involving teaching with technology (McNaught, 2003; Palloff & Pratt, 2013). C. Roberts (2008) argued that when faculty consider new technologies, it is essential to evaluate the adoption benefits and constraints that are specific to each institution. The following chapter further addresses numerous hurdles presented by the adoption of technological innovations in higher education. In the following paragraph, I preview some of the technology-related issues faculty may experience.

With dependence on technology, there are challenges that arise because technology is transient. Technology transience is defined as the qualities of technology and the duration of time that technology experiences in higher education before it is replaced or discarded for whatever reason (Amirault, 2015). Long-lasting technologies in higher education (e.g., printed book, quill pen, candle) tend to have simple characteristics (Amirault, 2015). More complex innovative technologies, such as Google Glass, have quickly faded (Barr, 2015). Google Glass is computer technology that users attach to their head, so they can essentially view a computer monitor through an eye glass lens (Rauch, 2014). The easy-to-use and effective interactive smartboards have dramatically changed teaching and learning in higher education (Bokhari, Ahmed, Alam, & Masoodi, 2011). Faculty members widely use smartboards and clickers

because they increase student engagement in learning (Bokhari et al., 2011; Terrion & Aceti, 2012).

Additionally, there are many factors that influence community college faculty decisions on whether to implement an educational technology in their teaching (M. T. Murphy, 2015). One factor that tends to increase the likelihood of community college faculty implementing instructional technology into their teaching is whether community college faculty perceive that technologies are readily available, such as lecture capture (podcasting), streaming video, Google docs, and clickers (M. T. Murphy, 2015).

Although there are many technologies being adopted by faculty in higher education teaching and learning, this study focuses on podcasts. Students are likely to be comfortable and familiar with podcasting technology because they have iPods, MP3 players, and smartphones that they have used for entertainment and educational purposes. There is evidence to suggest that podcasting engages community college students in learning and increases student success in community colleges (Jones & Hansen, 2014). Researching how podcasting is being used in higher education and analyzing faculty perceived benefits and constraints for adopting podcasting in teaching revealed more about podcasting as an instructional technology.

Description of the Research Problem

Podcasting is one of many instructional technologies being adopted by higher education faculty to facilitate learning (EDUCAUSE Learning Initiative [ELI], 2005). Podcasting is a mobile digital file recording of sound and/or video that is accessible from a website or mobile technology device. Podcasting used for educational purposes is considered mobile learning because podcasting provides for the educational content's portability via MP3 players (Traxler, 2008). The iPod has proven to be a creative instructional technology tool used by universities to

deliver class materials captured in podcasts to students (Belanger, 2008; Fuson, 2006; Kaplan-Leiserson, 2005). Salmon and Nie (2008) examined the value of podcasting for students in an article entitled, "The Informal Mobile Podcasting Academy and Learning Adaptation (IMPALA)," which was funded by the UK Higher Education Academy. The IMPALA study found that podcasting provided students with flexibility in learning with respect to study time, study location, study sequence and pace, timely content, the choice to listen instead of reading or observing, and new forms of communication, such as feedback from professors (Salmon & Nie, 2008). Consequently, studying faculty adaptation to podcasting as an instructional technology in higher education will contribute to the body of literature.

Purpose of the Study

The purpose of this study was to analyze perceived benefits and constraints faced by California community college instructors when adopting podcasting in their classroom teaching.

Research Questions

Four research questions were posed in this study:

1. Why have some community college faculty in California decided to adopt podcasting in their classroom teaching?
2. What constraints did these instructors perceive to the adoption of podcasting?
3. What benefits did faculty perceive about the adoption of podcasting?
4. How did faculty use podcasting?

Significance of the Study

Literature on adopting innovation and technology abound. However, limited scholarship exists on adopting podcasting as an instructional technology. Given that podcasting has been an instructional technology adopted by faculty in higher education, there is a need to study faculty

perceptions of its adoption (ELI, 2005). This study is significant because many more diffusions of innovative instructional technologies in higher education are anticipated as technology innovations continue to explode in society (DeNoyelles et al., 2015; Sweet et al., 2013; The White House, 2018). Understanding how higher education faculty adopted one technology may contribute to the body of knowledge by helping us to understand how faculty might adopt other forms of technology in their teaching.

Community colleges are undergoing an iterative analysis to adapt to the changing needs of today's students (Thornton, 2013). Evidence suggests that podcasting engages community college students in learning and increases student success (Jones & Hansen, 2014). Exploring how to increase student success is very important in community colleges (Kadlec & Rowlett, 2014; Saunders, 2014). An important objective of community colleges is for students to achieve lifelong learning (Fanelli, 2013). Podcasting has the potential to help students of all ages achieve lifelong learning in furtherance of the community college mission. Podcasting could be combined with credit-free classes to help community colleges fulfill their mission of lifelong learning for senior citizens. Podcasting's potential impact on student success is another important reason to learn about how faculty use podcasting in community colleges.

This study can contribute to current literature and opportunities for learning about podcasting in higher education and policy development; for example, California community college faculty and administrators might find this study helpful in their decision-making process to adopt podcasting. This study's findings provide support for administrators' and faculty members' decision to introduce and adopt podcasting in teaching. Faculty at community colleges and universities who are considering adopting podcasting in their teaching may find this

study helpful because the findings inform why some community college faculty in California have decided to adopt podcasting in their teaching.

Theoretical Framework

Rogers' (2003) theory on the diffusion of innovation is used as the framework for this study. In this study, California community college faculty-perceived attributes of innovation and the rate of adoption are used to help explain how faculty develop attitudes and behaviors toward podcasting as teaching tools in higher education. Also, the perceived attributes of innovation and the rate of adoption provide a context for faculty adoption of podcasting as a teaching tool in higher education (Rogers, 2003). Rogers' (2003) theory will be explained in more detail in Chapter 2.

Description of the Study

This investigation examined how and why California community college faculty adopted podcasting as a teaching and learning tool using a qualitative multiple case study research design (Yin, 2014). Embodied in a constructivist viewpoint, qualitative case study research seeks diverse realities and aims to explore phenomena from participants' perspectives (Creswell, 2003; McMillan & Schumacher, 2010; Merriam, 2009; Stake & Munson, 2008; Yin, 2014). Qualitative research fits the context of people's perceptions (Lawrence, 2015; Patton, 2002; Stake & Munson, 2008). In this investigation, the bounded unit was each individual faculty member. Data analysis of the individual findings led to common themes. This study employed a framework based upon ideas of Patton (2002) and Creswell (2003). A plurality of faculty members involved demonstrates qualitative multiple-case study research (Yin, 2014). Multiple-case studies embody studies that analyze several cases, such as is the case here (Yin, 2014).

This qualitative multiple-case study approach consisted of seven interviews to examine and explain the procedure of adaptation of community college faculty via data collection and data analysis. Upon completion of each individual faculty member case analysis, I conducted analysis across all seven faculty member cases to seek themes and common patterns found among individual faculty members; I then aggregated these themes (Patton, 2002). Several limitations are noted in this study. First, I focused my research on California community college faculty. Second, this study is limited to California community college faculty found to have posted podcasts for their classes in iTunes. Consequently, it is possible that some California community college faculty had not posted their class podcasts in iTunes and therefore would not be included in this sample. Third, since interviews are the data collection method in this study, the interviews were subject to interview bias. Fourth, I did not interview participants who were interested in using podcasts in their teaching but had not yet adopted this technology. Fifth, the data for this study are 10 years old and were obtained in 2008.

My Positionality

My interest in this topic started when I decided to adopt podcasting in my teaching of university reading, writing, and study skills courses. My undergraduate students were motivated by and engaged with podcasting technology. What I found is that integrating podcasting in my college teaching met the needs of students across the continuum in my classes. Furthermore, as I reflect on my first experience with higher education as a community college student, I wish I had been more engaged as a student. My personal experience has shown me that podcasting has the potential to increase community college student engagement and student success. Also, I believe podcasting has the potential to improve community college faculty professional development by teaching faculty new and rewarding ways to improve their college teaching.

Chapter Summary

The traditional nature of education results in slow changes in education happening over a period of time. Recent efforts at educational reform have resulted in the exploration of technology integration in teaching to help equip students with skills required for jobs in a career environment with increasing emphasis on technology. Students are interested in instructional technology; this may be because today's students have grown up in a digital age and are familiar with various technological devices. Faculty's decision to adopt a technology in their teaching is shaped by several factors. One powerful factor is whether faculty members perceive that the technology will positively impact teaching and student learning.

Chapter 2: Review of the Literature

The purpose of this study is to analyze perceived benefits and constraints of California community college instructors for adopting podcasting in their classroom teaching. The study is guided by the following research questions:

1. Why have some community college faculty in California decided to adopt podcasting in their classroom teaching?
2. What constraints do these instructors perceive to the adoption of podcasting?
3. What benefits do faculty perceive about the adoption of podcasting?
4. How do faculty use podcasting?

A review of relevant research and scholarship helps provide a framework for understanding why faculty do or do not adopt new technology. The literature review is divided into three sections. The first section offers an historical perspective of instructional technologies, including an in-depth description of podcasting. The second section of the literature review examines theories related to change and how individuals adopt new ideas. The final section of the chapter explores changes in education, specifically the adoption of new technology, through the lens of the diffusion of innovations theoretical framework (Rogers, 2003) to help explain why some people adopt a new technology while others may not.

Historical Perspective of Instructional Technologies

Instructional technology has undergone many changes since its inception in the early 1900s (Reiser, 2001). For example, from the 1910s through the 1920s, instructional technology was defined as instruction enhanced by visual media such as graphs and charts (Reiser, 2001). Also, from the 1920s through the 1940s, media advances such as motion pictures and radio broadcasting shifted the definition of the field to instruction that was audiovisual (Hew,

2001). Radio technology was initially a recreational pursuit of boys and men, as well as a military communication tool during World War I, prior to becoming more popular in the 1920s (Taylor, 2012). Radio was also beneficial and used for a variety of educational endeavors (Hew, 2004). Motion pictures incorporating sound was followed by more interest in achieving learning by using media (Hew, 2004). In the 1950s, the advent of television further expanded the audiovisual nature of instructional technology and reinforced the instructional media nature of instructional technology (Hew, 2004; Reiser, 2001). Later in the 1950s, the instructional technology field shifted yet again.

Education leaders influenced how instructional technology was perceived. In the late 1950s and throughout the 1960s and 1970s, James D. Finn sought to transform instructional technology from an audiovisual and instructional tool to a professional research-based process that provided results to identified instructional issues (Januszewski, 1994). In 1965, Finn provided a new label for the field—*educational technology*—and urged that it be grounded in theory (Januszewski, 1994). Another major historical event was the great impact of computers on instructional technology.

Computers established an international presence in society after the Second World War (Aspray, 1986). Before World War II ceased in 1945, computers were not known to most people (Aspray, 1986). However, by 1955, there were an excess of 200 computers operating in 15 countries in four continents and Japan, fueled primarily by computer technology exports from the United States and Great Britain (Aspray, 1986). During the decade of 1945–1955, computers also began to be used in government and academic research (Aspray, 1986). The adoption of computers in higher education continued, and now computers are in the hands of both students and faculty.

In the 1980s, personal computers increasingly became an educational media subject of educators' attention and transformed instructional technology yet again (Hew, 2004). According to Hew (2004), the Internet was established by Tim Berners-Lee in 1991 and was quickly and widely adopted and was followed by the world wide web, which was facilitated by the increasing availability of personal computers.

With the widespread use of computers, instructional technology was designed for faculty. PowerPoint is one such example of educational technology being used by faculty to help with teaching presentations (Craig & Amernic, 2006). Students also like PowerPoint because it helps clarify teaching and is entertaining (Craig & Amernic, 2006). Even though PowerPoint has appeal with students, some question the educational value of PowerPoint and whether it helps students significantly improve grades compared to teaching without using PowerPoint (Craig & Amernic, 2006). Others note that PowerPoint does have a positive impact on student grades (Craig & Amernic, 2006).

Furthermore, computers have facilitated other changes in the learning place (Albirini, 2007). For example, computers have expanded learning and provided access to the Internet and online learning (Albirini, 2007; Carlson, Burgess, & Miller, 1996). Computers have also impacted instructional technology because they improved teaching efficiency (Albirini, 2007). An increasing number of students are enrolled in online courses that use instructional technology, including learning management systems to facilitate online class discussions and assignments (Allen & Seaman, 2006); for example, over 6.3 million students enrolled in online classes in Fall 2016, which was over 5.6% more than who enrolled in Fall 2015 (Friedman, 2018).

Also, online learning is increasingly being used by members of the U.S. Armed Forces who are serving overseas and paying for their online education with the G.I. Bill (McMurray,

2007). McMurray (2007) noted that a variety of online technologies are being used by the military to obtain a college education. Online learning has also expanded possibilities for students to obtain an education worldwide (McMurray, 2007). Furthermore, distance education is increasingly popular in academia because it is a cost-effective way to increase student engagement (Baggaley, 2008). These benefits of distance education make it an attractive alternative to students and faculty.

Another emerging technology to be used in online education is asynchronous (time-delayed) online learning, such as WebCT or Blackboard (Shana, 2009). Asynchronous online learning technology uses online discussion boards for students to interact with each other and has the potential to increase student learning (Groves & O'Donoghue, 2009). With asynchronous learning, students post comments, questions, or reflections in online discussion boards at different times and return to see their colleagues' or instructors' responses or feedback online (Groves & O'Donoghue, 2009). Faculty have a vested interest in having an effective asynchronous learning technology system, and they often have to devote substantial time to manage the system with the goal of improving teaching and learning (Andresen, 2009).

Asynchronous learning technology can be used properly to enhance teaching and learning (Andresen, 2009; Groves & O'Donoghue, 2009). In Groves and O'Donoghue's (2009) study, 29 undergraduate students who completed an asynchronous online seminar in a sports studies degree program at a British university completed questionnaires about their online experience. The purpose of the investigation was to examine how the asynchronous online seminar could improve student learning and to find out how to improve the asynchronous online seminar. What they found was that 27 students said the online seminar was a positive experience. However, they also found that five students lacked motivation to participate in the online seminar, three

students did not receive feedback on their class presentations from the professor, and two students felt the online seminar did not significantly improve learning. Significantly, 22 students said that the feedback received from fellow students in the online seminar was most helpful to their learning (Groves & O'Donoghue, 2009). However, students did not appear to be aware of the benefits of providing feedback to other students in the online seminar (Groves & O'Donoghue). Also, students recommended including face-to-face classroom discussions in future online seminars because of the benefits of interpersonal communication with classmates (Groves & O'Donoghue, 2009).

This study was helpful because it showed that some students are motivated to participate in online seminars for different reasons (Groves & O'Donoghue). Some value online feedback and online interaction from peers. Others are not motivated to participate in an online class and instead value face-to-face interaction in class. Also, these researchers showed that online seminars may be of most value when combined with face-to-face classroom discussions. In fact, some faculty members do combine online learning with face-to-face class instruction, which is known as blended learning (Oh & Park, 2009). Blended learning may use such tools as online discussion boards to offer students another tool to engage course discussions (Shana, 2009). However, blended instruction can be problematic and faculty members have faced a number of issues, including technology support and motivation (Oh & Park, 2009). Nevertheless, blended instruction is beneficial to students because of the active learning involved and time flexibility (Oh & Park, 2009).

Clickers are a new instructional technology being used in academia. Research shows that clickers promote active learning and positively impact student engagement (Martyn, 2007). Blogs are another recent helpful development in instructional technology (Saeed, Yang, &

Sinnappan, 2009; Yang, 2009). Blogs are an online version of a journal that can be used in higher education for student assessment and to promote student and teacher interaction (Yang, 2009). Recent advances in instructional technology include wireless mobile devices (Shih & Mills, 2007; Traxler, 2008). Wireless devices (e.g., personal digital assistants) are increasingly being used in higher education to help with teaching and learning (Hew, 2004; Shih & Mills, 2007). Furthermore, mobile technologies are being adopted at increasing rates in higher education (Kim, Mims, & Holmes, 2006). Also, wireless computers have been used by faculty as an instructional technology.

In February 2003, Savery and Reed (2006) studied 71 full-time faculty members at the University of Akron's College of Education who had replaced their desktop computers with wireless laptop computers in 2001. Forty-six of the faculty members completed surveys about their experience using the wireless laptops; also, 16 of those faculty members were interviewed about their experiences. The purpose of the investigation was to examine how the wireless laptop computers had impacted faculty teaching, research, and service (Savery & Reed, 2006).

What they found was that 97% of the faculty members surveyed considered the wireless laptops to be a positive or resounding success. Fifty-one percent of the population also used their laptops at home daily. Significantly, 68% of the population indicated an increased interest in incorporating the wireless laptops into their teaching, research, and service. This study is helpful because it shows that almost all faculty members who were studied viewed use of the new technology as a positive experience. Also, this study shows that after experiencing the new technology, over two thirds of the population said they would use the wireless laptops in their teaching, research, and service (Savery & Reed, 2006).

Furthermore, virtual worlds are another new emerging instructional technology. Second Life is an example of a virtual world that is being used as an instructional technology (Warburton, 2009). There is some disagreement about what constitutes a virtual world because of the varied characterizations that have hindered consensus among opinion leaders (Warburton, 2009). However, one virtual world definition stands out: "A computer-generated display that allows or compels the user (or users) to have a sense of being present in an environment other than the one they are actually in, and to interact with that environment" (Schroeder, 1996, p. 25). Also, podcasting is another emerging technology.

Description of podcasting. The ELI (2005) described podcasting as "any software and hardware combination that permits automatic downloading of audio files (most commonly in MP3 format) for listening at the user's convenience [because] podcasting sends audio content directly to an iPod or other MP3 player" (para. 1). Also, an iPod and an MP3 player are described as a "portable digital audio player that allows users to download music from their computer directly to the device for later listening" (ELI, 2005, para. 1). Podcasting refers to podcast creation and podcast distribution (Salmon, Mobbs, Edirisingha, & Dennett, 2008). The podcast has three categories: "audio, video, and enhanced" (Salmon et al., 2008, p. 22). According to Salmon et al. (2008), "These categories refer to the type of media file contained in the podcast" (p. 22). Podcasts with only sound are audio podcasts, those with imagery and sound are video podcasts, and "enhanced podcasts are an extended version of audio podcasts capable of displaying additional information such as still images, weblinks and chapter markers" (Salmon et al., 2008, p. 22).

According to Elizabeth Townsend-Gard, a former fellow of the London School of Economics, a current fellow at Stanford Law School, a current associate professor of law at

Tulane University, and Co-Director of the Tulane Center for Intellectual Property Law & Culture (Tulane University Law School, 2010), and Colette Vogele, a fellow at The Center for Internet and Society at Stanford Law School and a senior attorney for Microsoft Corporation (The Center for Internet and Society, 2010), the beginning of podcasting was influenced by blogging and the idea that anyone could publish material (Townsend-Gard & Vogele, 2006).

Additionally, podcasting content is intellectual property protected by copyright law (Townsend-Gard & Vogele, 2006; Vogele & Garlick, 2006), and there are concerns related to intellectual property rights in podcasting. Furthermore, faculty should first obtain permission from any owners of content before including any content in a podcast to avoid possible legal issues due to third-party ownership (Vogele & Garlick, 2006). The potential for copyright law violations with respect to others' material in podcasts is another area of which to be aware (Vogele & Garlick, 2006). For example, "Copyright law is relevant to podcasts because it applies to creative and expressive works, which are most of the things that are included in a podcast" (Vogele & Garlick, 2006, para. 4).

Finally, before including others' music, sound recording, or videos in podcasts, faculty and students should inquire about additional licenses and permissions required from the owners to prevent copyright violations (Townsend-Gard & Vogele, 2006). The possibility of people stealing others intellectual property in academia is a timely concern because this happens in the business world. For example, in Australia, businesses are experiencing intellectual property theft of various media content that is subsequently being used by competing businesses (Switzer, 2009).

Although, copyright law applies when you include others' work in your podcasts, there is no copyright law restriction when you include the following types of works:

(a) works in the public domain—these types of works are no longer protected by copyright law and may be freely used; (b) works that are podsafe—owners of podsafe works allow free use of their materials, with one exception: you may not use podsafe works for commercial purposes; (c) U.S. Government works—anyone may freely use government works; (d) your own podcasts that you created; and (e) others' works when you have obtained permission from the property owners to use those works (Townsend-Gard & Vogele, 2006).

Additionally, faculty may be concerned about intellectual property ownership of podcasts because there may be issues about whether the faculty member or the institution has ownership rights to the podcast. Also, intellectual property ownership of podcasts may be further complicated because of the free access to instructional podcasts that are made publicly available on iTunes. Faculty members may want to negotiate with universities to establish an intellectual property right ownership agreement for instructional podcasts before instituting a university-wide podcasting endeavor (Read, 2007). Furthermore, students should be concerned about intellectual property rights in podcasting, because students are creating podcasts to demonstrate learning in higher education (Lazzari & Betella, 2007) and their podcasts are their intellectual property. Therefore, faculty, students, and universities should familiarize themselves with intellectual property law before creating podcasts that involve others' work and/or their own work.

History of podcasting. Podcasting, introduced in the last 13 years and first used for entertainment and information purposes, was previously referred to as audio-blogs and was popular on Internet radio shows (Salmon et al., 2008). In 2004, journalist Ben Hammersley, writing in *The Guardian*, created the term podcasting to identify listening to Internet audio weblogs. Also, podcasting started as Internet radio because it is relatively simple and

inexpensive to create podcasts with inexpensive software and MP3 players; consequently, it is easy for the average person to create and publish podcasts (Hammersley, 2004). The first podcast was produced by Christopher Lydon, an established Boston area television and radio journalist, when he interviewed famous blogger, Dave Winer, and uploaded the podcast to skyBuilders.com in July 2003 (Doyle, 2005).

Adam Curry is the Co-Founder of PodShow, which offers "thousands of podcasts that juggle topics including comedy and culture, education and technology" (Miller, 2006, para. 25). Adam Curry is known as the "Podfather" of podcasting (Campbell, 2005; Dale, 2007; Miller, 2006). Curry is known as the Podfather because

> Curry along with software pioneer Dave Winter, developed the computer programs that make podcasting possible. Essentially, the pair's combined work in programming was instrumental in allowing audio clips and shows to be success-fully downloaded by listeners onto iPods and MP3 devices. (Miller, 2006, para. 21)

From Adam Curry and Dave Winter's innovative origins, podcasting has grown to provide a number of uses. For example, podcasting has been used to deliver news on radio shows (Hammersley, 2004) and online newspapers (Hammersley, 2004; Islam, 2007), by professional organizations to communicate with their members on topics of interest (Islam, 2007), by museums as audio guides for patrons (Islam, 2007), by virtual environments such as Second Life to provide class lectures to students (Braun, 2007), by companies to introduce new products (Islam, 2007), and by companies to provide training for workers (Islam, 2007; Nguyen & Giordano, 2007).

Furthermore, on July 11, 2006, the website podlinez.com started offering complimentary access to podcasts directly from mobile phones (podlinez.com, 2010). Podlinez.com's free telephone access to podcasts was important because the increasing access to podcasts likely

resulted in more people becoming familiar with, listening to, and learning about podcasting (Braun, 2007). Podlinez.com also had the potential to expand access to podcasts for those who lacked technological skills or Internet access. Additionally, podcasting has recently become popular due to increasing consumer awareness and the mobile nature of podcasting (O'Connell, 2017). According to a 2018 study by Edison Research, an estimated 124 million people age 12 or older in the United States (44% of U.S. population) reported that they had heard a podcast compared to just 11% of the population in 2006. The next section discusses podcasting in education.

Podcasting in education. Podcasting is a new technology that is being adopted by faculty in their teaching in higher education (Harris & Park, 2008; Lazzari & Betella, 2007; Lum, 2006). Duke University is noted for introducing one of the earliest academic uses of podcasting in Fall 2004 when they gave iPods to more than 1,600 incoming students to use in their academic learning (Belanger, 2005). Also, Apple's iTunes Music Store offers over 150,000 free audio and video podcasts on numerous topics (iTunes, 2010). One of the topics offered in the iTunes Music Store is educational podcasts in higher education.

Podcasting has been used as an instructional technology in higher education in a number of disciplines and areas, including foreign language classes (Abdous, Camarena, & Facer, 2009; Ducate & Lomicka, 2009), teaching and lecture presentations (Harris & Park, 2008), online learning (Fothergill, 2008; Sanders, McNierney, & Hazy, 2009), engineering classes (Berger, 2007), distance learning (Harris & Park, 2008; M. J. W. Lee & Chan, 2007), music classes (Cooper, Dale, & Spencer, 2009; Kerstetter, 2009), economics classes (Hofer & Swan, 2009), aviation classes (Harrison, Smith, & Yates, 2009), multimedia communication (Lazzari, 2009), and tourism management classes (Dale, 2007).

Podcasting has also been used in physiology classes (Abt & Barry, 2007), university marketing to students (Harris & Park, 2008), nursing classes (Walker, 2008), dermatology courses Alikhan, Kaur, & Feldman, 2010), politics (Ralph, Head, & Lightfoot, 2009; M. Roberts, 2008), dance performance (Dale & Pymm, 2009), international relations (Ralph et al., 2009), information systems management (Fernandez, Simo, & Sallan, 2009), psychology courses (Callaway, 2009), art classes (Buffington, 2010), business courses (Evans, 2008; Walls et al., 2010), honors courses (Lang, 2010), drama classes (Dale & Pymm, 2009), and education courses (Walls et al., 2010).

Educational podcasting is considered mobile learning because podcasting enables educational content's portability via MP3 players (Traxler, 2008). The iPod has proven to be a creative instructional technology tool used by universities, such as Duke University and Georgia College & State University, to deliver class materials captured in podcasts to students (Belanger, 2008; Fuson, 2006; Kaplan-Leiserson, 2005). Salmon and Nie (2008) conducted a study in 2006 where 20 university faculty members and 500 students at the University of Leicester were interviewed and completed questionnaires. The authors examined the value of podcasting for students. The Informal Mobile Podcasting Academy and Learning Adaptation (IMPALA) study was funded by the UK Higher Education Academy, and Salmon and Nie (2008) found that more than 70% of the students owned an MP3 player. Also, they found that podcasting provided students with flexibility in learning with respect to study time, study location, study sequence and pace, timely content, the choice to listen instead of reading or observing, and new forms of feedback from professors (Salmon & Nie, 2008).

In the IMPALA study, Salmon and Nie (2008) found podcasting positively impacted students' motivation to learn and student engagement. They also found that the ability to replay

the podcasts increased students' proficiency with notetaking, cognition, and learning. Additionally, the study revealed that students appreciated podcasting's alternative delivery of educational content to complement course textbooks. Also, in the IMPALA study, Salmon and Nie found that faculty members used podcasting to deliver fieldwork instructions to students in the geography, earth, and environmental sciences disciplines, resulting in increased learning locations. Students also reported that podcasts helped encourage learning discussions because students said that "listening to podcasts made their lecturers feel 'more friendly,' inviting and personal than in class" (Salmon & Nie, 2008, p. 9). Furthermore, the data revealed that podcasting provides opportunities for students to contribute to learning by creating their own podcasts and as a vehicle for student reflection. Another finding was that podcasting accommodates students with different learning styles, such as auditory learners (Salmon & Nie, 2008).

In the IMPALA study, Salmon and Nie (2008) also found that students were using podcasts for learning as opposed to entertainment; student responses to interviews and questionnaires indicated "that students perceived listening to podcasts as a learning activity and different from listening to music, which is often 'background' activity" (p. 10). The authors also found that students required more concentration when listening to podcasts of an educational nature as opposed to listening to entertainment podcasts. Also, the data revealed that most students were enthusiastic about listening to the educational podcasts (Salmon & Nie, 2008).

In 2005, Lazzari and Betella (2007) developed Podcast Generator, "a podcasting service to integrate the e-learning facilities of the University of Bergamo" (p. 405) in Italy. Podcast Generator is "an open source library for building and managing podcasting services" (Lazzari & Betella, 2007, p. 406). Lazzari and Betella (2007) also created Pluriversiradio, "a podcasting

service freely accessible via web . . . or through a feed aggregator" (p. 406). Podcast Generator has three main functions: (a) storing and cataloging podcasts, (b) "loading podcasting into the database" (Lazzari & Betella, 2007, p. 406), and (c) functioning as a course management system to distribute the podcasts from the website (Lazzari & Betella, 2007). Over 500 universities in Italy and overseas currently use the podcast library (Lazzari & Betella, 2007).

Also, Lazzari and Betella (2007) studied full- and part-time students enrolled in a human computer interaction course at the University of Bergamo to determine whether podcasting impacted student learning. All of the students in the study accessed podcasts containing recordings of class lectures. However, the full-time students also participated in an experiment where they were required to create their own podcasts "based on three assignments: two re-elaborations of pre-existing interviews and the development of a lesson about one of the themes of the theoretical course not yet dealt by the lecturer" (Lazzari & Betella, 2007, p. 407).

Lazzari and Betella (2007) showed that the full-time students received higher grades than the part-time students, and the grade differences were significantly higher than in previous years. The study's implications are that part-time students' grades were not impacted by listening to podcasts of faculty lectures. Also, the study's implications are that full-time students' grades were impacted by creating their own podcasts and suggests that their involvement in creating podcasted lessons enhanced their learning experience in a very effective manner; by figures and observation we can say that podcasting design, recording, and editing spurred the development of reflective learning skills, stimulated students to go deep into the questions they had to face, fostered collaborative behaviors (Lazzari & Betella, 2007, p. 408).

Furthermore, in the student satisfaction surveys, the full-time students indicated that they perceived the course quality to be high based on podcasting creativity offered in the course

(Lazzari & Betella, 2007). Next, Lazzari and Betella's (2007) findings about educational podcasting quality and faculty adoption of podcasting are described. Lazzari and Betella found that the attributes of podcasting may impact a decision by faculty to adopt the innovation. They identified three attributes of podcasting that are key for creating "high quality podcasting services" (Lazzari & Betella, 2007, p. 409). Those three attributes are: "1) Quality of the production environment: recording and editing. 2) Quality of the product: content and communication style. 3) Quality of the distribution environment: paratext and management" (Lazzari & Betella, 2007, p. 409). Lazzari and Betella (2007) also noted:

> Moreover, the academic environment suggests different ways to manage the podcasting that can be used for recording lectures, but also workshops, conferences, discussions, interviews, and also for training students, who can produce podcasts by themselves as part of their assignments. (p. 409)

Therefore, this study is helpful because it shows that an Internet podcast library has become increasingly popular with universities to share information. It also shows that student podcasting creation, as opposed to merely listening to podcasts, may positively impact student learning. Also, Lazzari and Betella demonstrated that the attributes of podcasting may be managed to increase the educational podcasting quality.

Podcasting perceived benefits and constraints. Harris and Park (2008) studied podcasting at universities in the United Kingdom during 2006-2007 by analyzing information about podcasting from the Internet. The purpose of the study was to learn about the benefits and implications of podcasting adoption. What they found was that there are four "characteristics of educational podcasting: 'teaching-driven,' 'service-driven,' 'marketing-driven' and 'technology-driven' based on the grouping of podcasting at UK Universities" (Harris & Park, 2008, p. 549). Podcasting is teaching-driven because it was used to deliver lectures, seminars, and academic

news to students; podcasting is also used by students to present course assignments, such as research papers (Harris & Park, 2008).

Furthermore, Harris and Park (2008) found that podcasting was service-driven because it provides a vehicle to gather and disseminate information, such as research work, library services, university news, and services to students with learning disabilities. Also, podcasting was found to be marketing-driven because it was used by the university to help recruit new students (Harris & Park, 2008). Finally, podcasting was found to be technology-driven because podcasting was used to help teachers improve teaching skills (Harris & Park, 2008). Harris and Park also found that educational podcasting has three viewpoints that inform why podcasting is being adopted: (a) lecturers' viewpoints, (b) students' viewpoints, and (c) the university's viewpoint.

According to Harris and Park (2008), the lecturer's perspective is that podcasting complements teaching by allowing faculty members to highlight critical points to students. The student's perspective is that podcasting provides flexible and efficient learning opportunities that allow students to review material (Harris & Park, 2008). Also, the university's perspective is that podcasting is a communication tool to reach the university's audience (Harris & Park, 2008). Therefore, this study is helpful because it describes the educational characteristics of podcasting and the three perspectives of podcasting that inform why podcasting is being adopted in higher education.

In another informative study, A. Brown et al. (2009) at East Carolina University examined how 11 faculty members from instructional technology and library science fields were using podcasting in their online teaching. The purpose of the study was "to research the impact and potential of using podcast technologies for instruction" (A. Brown et al., 2009, p. 352). The researchers employed an action research method over a period of 1 year. The faculty members

participated in group discussions, e-mail interviews, and maintained journals and shared reports with each other describing "what technologies are most commonly applied to the task of podcast production and dissemination as well as the instructional purposes and tasks commonly addressed when using podcasting as a teaching strategy" (A. Brown et al., 2009, p. 352).

In this study of faculty members, A. Brown et al. (2009) "identified four distinct technologies employed in their podcasting efforts: audio, video, screencast, and slideshow" (p. 355). Screencast and slideshow technology are more technical forms of technology, and their definitions are included here to provide meaning: "Screencast is defined as visual data internal to the computing environment captured by recording software that may be accompanied by external audio data (e.g., software such as Camtasia by Techsmith)" (A. Brown et al., 2009, p. 355, 357). Also, slideshow technology "is defined as visual and possibly audio data presented as discrete screens (for example a Microsoft PowerPoint presentation)" (A. Brown et al., 2009, p. 357).

A. Brown et al. (2009) found faculty members were using the four podcasting technologies in eight distinct instructional strategies: "lecture, demonstration, elaboration/ clarification, feedback, interview, instructions/assignment, and social presence" (p. 357). The researchers also found that faculty most frequently used audio podcasting, followed by slideshow podcasting, video podcasting, and screencasting (A. Brown et al., 2009). Student feedback from courses in which faculty members used podcasting was generally positive with some negative comments (A. Brown et al., 2009).

For example, most students commented that podcasting increased social presence and provided a welcome alternative to text information in the course (A. Brown et al., 2009). However, other students pointed out that there were difficulties in finding compatible technology to play the video podcasts. Some students preferred text information to the podcasts. Also,

faculty members revealed their high interest in using podcasting in their teaching but, they also pointed out significant technical challenges to produce screencasting, slideshow, and video podcasts. However, faculty members noted that audio podcasts were easy to create. A. Brown et al. (2009) also found that faculty members and most students believed podcasting had a positive impact on student experiences in the online courses. This study was helpful because it showed that podcasting can increase social presence for students in online classes. Also, these authors revealed four podcasting technologies that faculty members have used in eight instructional strategies in online classes. Furthermore, A. Brown et al. identified specific students' and faculty members' perceived benefits and constraints of podcasting as an instructional technology in higher education.

In 2007, Shim, Shropshire, Park, Harris, and Campbell had 200 students from two universities in the United States complete questionnaires to examine students' perceptions of webcasting and podcasting value. Webcasting is different from podcasting since "a podcast has a persistent site, capable of synchronizing with a portable multimedia device, such as an MP3 player or iPod" (Shim et al., 2007, p. 588); however, webcasting "is streamed from the internet and requires the user to be connected to the internet while playing or viewing the webcast files" (p. 588). The researchers proposed eight hypotheses for this study:

H1. Immediacy of feedback is significantly related to intention to use podcasting.

H2. Personal focus is significantly related to intention to use podcasting.

H3. Transmission of cues is significantly related to intention to use podcasting.

H4. Functionality is significantly related to intention to use podcasting.

H5. Usability is significantly related to intention to use podcasting.

H6. Ease of use is significantly related to intention to use podcasting.

H7. User motivations are associated with future use intention.

H8. Users considering podcasting to be a better communication tool will use podcasting rather than webcasting in general. (Shim et al., 2007)

What they found was that, on average, students had been using podcasting or webcasting for less than 1 year. They also found support for four of the eight hypotheses: H2, H5, H7, and H8. This study was helpful because it showed that students' personalization and usability needs, as well as their user motivations, impacted their decisions to use podcasting. Also, this data revealed that both podcast and webcast users believed that podcasts were more effective learning tools than webcasts. One limitation of this study was that, on average, most users had little experience using podcasting. Nevertheless, Shim et al. found that the benefits of exposing students to new technology that was cost effective outweighed the small difficulties associated with podcasting.

One reason some faculty may not use podcasting is because podcasting can appear difficult to use to some professors (Read, 2007). Making podcasting easy for professors to use as an instructional technology may help increase the diffusion of podcasting in higher education (Read, 2007). For example, the University of California, Berkeley started and led a venture known as OpenCast (Young, 2007; Young & Fischman, 2007), which was "a cooperative effort to develop free, open-source software to make it easier for professors around the world to podcast their lecturers" (Young, 2007, para. 1). The venture was also known as the OpenCast Matterhorn Project, which was "a project, backed by an international community of higher education organization, that aims to build an open source, end-to-end platform that supports the scheduling, capture, managing, encoding and delivery of educational audio and video content" (OpenCast Community Project, 2010, para. 1). There are 65 OpenCast community members worldwide, including universities and organizations (OpenCast Community Project, 2010). The

OpenCast Matterhorn Project made podcasting very easy for professors to use in their teaching with software that allowed faculty to control what and when they record classroom lectures, allowing faculty to edit class discussions and distribute the instructional podcasts to channels such as iTunes, YouTube, and course management systems (OpenCast Community Project, 2010). Companies that sell products like the OpenCast software include Sonic Foundry (Young & Fischman, 2007), Echo360, Kaltura, MediaDrop, Plumi, Zencoder, SHIFT72, Ensemble Video, Brightcove, TechSmith Relay, Cisco Show and Share, Mediasite, Ooyala, Panopto, and Tegrity (AlternativeTo, 2017).

Additionally, universities should consider involving students in shaping instructional podcasting content to try to increase student use of podcasting (Read, 2007). Student access to instructional podcasts should also be easy, and universities may use iTunes to distribute podcasts to students because iTunes is a free service; students may easily access instructional podcasts on iTunes from an iPod, an Internet connection, or a course management system (Read, 2007).

However, podcasting is controversial. One concern is the intellectual property ownership of the podcast, since there may be an issue as to whether the faculty member or the institution owns the podcasting content. The free access to instructional podcasts that are made available on iTunes may need to be considered when considering whether or not to use iTunes as opposed to a course management system to distribute podcasts to students. Also, universities and faculty should reach an agreement on intellectual property rights to instructional podcasts before instituting a university-wide podcasting endeavor (Read, 2007).

Furthermore, some students might view podcasting as a valuable instructional technology because they see podcasting as a convenient supplement, since classroom lectures may be recorded as podcasts and made available to students who may miss class or want to hear the class

lecture again (Lane, 2006; Stott, 2006). Conversely, others disagree and point out some shortcomings of podcasting. For example, both students and faculty express concern that integration of podcasting into education could result in increased student absenteeism (Lane, 2006). In fact, first-year college students have been more likely to miss class because podcasts were available in their class (Holbrook & Dupont, 2009).

Also, faculty have expressed concern that students who miss class and then listen to class lectures on podcasts would lose the valuable student-professor class interaction that contributes to student learning (Schneider, 2006). Conversely, McKinney's study at the State University of New York in Fredonia found that students who missed class and then took notes while listening to a psychology podcast lecture received higher grades on an exam than students who listened to the lecture in class (Callaway, 2009; McKinney, Dyck, & Luber, 2009). In contrast, Schneider (2006) explained how the time delayed nature of podcasting lectures lacks rich classroom instructional experiences for students: "[Students] have to participate because I can't teach if they don't: I have to have a sense if my students are following me or not" (p. B5). Consequently, podcasting is not like putting computers on people's desks—not everyone will use podcasting.

Individual faculty members will decide whether or not to adopt podcasting as an instructional technology in their teaching, and a number of factors will impact their decision. Chief among those decisions is whether or not faculty members perceive that podcasting will provide some value or benefit to their teaching and student learning. Therefore, podcasting is an interesting study because it makes a challenging decision in considering whether to adopt podcasting as an innovation in instructional technology. The next section discusses faculty, change, and the adoption of new ideas.

Faculty, Change, and Adoption of New Ideas

Reasons faculty adopt new technologies. There are several reasons why faculty may adopt technologies. These reasons include: (a) perceived value of instructional technology, evidence of learning, student learning opportunities, instructional technology training, and personal gratification.

Perceived value of instructional technology. Faculty members tend to adopt technologies when they believe instructional technology is easy to use and useful in their teaching (Agbonlahor, 2006; Spotts, 1999). Faculty members will also tend to adopt technologies when they believe that using the technologies in their teaching will increase their productivity and is an effective use of time (Zayim, Yildirim, & Saka, 2006). Also, faculty members tend to adopt technologies when they believe the technologies are more effective in teaching complex subjects then traditional classroom teaching methods (Jacobsen, 1998). Faculty members will also tend to adopt a technology when they perceive that the technology will improve instructor-student communication and save time (Spotts, 1999). Furthermore, faculty members tend to adopt technologies when they believe the technology improves teaching to students with varying learning styles (Zayim et al., 2006).

Evidence of learning. Furthermore, faculty may adopt technologies to help provide evidence of student learning (Wicker, 2004). For example, faculty may adopt e-portfolios in their teaching because their departments are required to provide evidence of student learning. An e-portfolio is an online digital version of a portfolio where students may upload learning objects (class papers and assignments) to show that they have met course requirements. Also, accreditation agencies easily accept e-portfolios as evidence of student learning when evaluating universities (Wicker, 2004).

Faculty may also adopt technologies such as podcasting to provide evidence of student learning (Lang, 2010). For example, Lang (2010) adopted podcasting learning technology in an honors course at Assumption College. Lang instructed students to create podcasts to demonstrate how individuals construct meaning in their lives, and the student podcasts were then evaluated for evidence of student learning. Lang found that the podcast assignment yielded student outcomes similar to other class assignments since some students performed very well, others performed average, and a few performed below average.

Student learning opportunities. An increase in student learning opportunities is also a reason that faculty may adopt technologies (Jacobsen, 1998; Prensky, 2001; Zayim et al., 2006). Faculty will adopt technologies when they believe that the technologies will improve student learning (Jacobsen, 1998; Spotts, 1999). Also, faculty will adopt technologies when they believe that technologies will help students collaborate on projects and increase student interest in courses (Jacobsen, 1998). Today's students have been called digital natives, and faculty may adopt technologies to teach students in a manner that appeals to students' digital learning styles (Prensky, 2001).

Instructional technology training. Instructional technology training for faculty may also influence faculty adoption of technologies (Agbonlahor, 2006; Jacobsen, 1997). Research has shown that the more faculty attend IT-related training courses, the more faculty tend to adopt technology in their teaching (Agbonlahor, 2006). Also, technology training should demonstrate how faculty can effectively use the technology in their teaching (Spotts, 1999).

Personal gratification. Faculty may also adopt technologies because of personal gratification. Jacobsen (1998) found that the most popular reason faculty adopt technologies was the personal gratification they received from acquiring new skills. Furthermore, faculty will tend

to adopt technology in their teaching when they perceive that using the technology in teaching will benefit them as faculty members (Spotts, 1999).

Reasons why faculty do not adopt new technologies. There are a variety of reasons why getting higher education innovators to adopt technologies is a challenge (Carr, 1999). These reasons include: (a) time demands, (b) reliability, (c) tenure concerns, (d) inadequate training, (e) lack of institutional support, (f) skepticism of technology's impact on student learning, and (g) lack of technical support.

Time demands. Any technology requires time to learn how to effectively incorporate it into classes (Backhouse, 2003; Brace & Roberts, 1996; Butler & Sellbom, 2002; Spotts, 1999). Furthermore, 86% of college lecturers do not have time to learn technology for online learning (Munroe, 2003). Also, faculty may be reluctant to integrate technology into teaching because of the time demands required to incorporate the technology (Carr, 1999; Jacobsen, 1998; Spotts, 1999; Walters, Burhans, Kershner, & Alphonce, 2000). Consequently, faculty members may be more inclined to adopt technology in their teaching if universities would provide release time for faculty members to learn how to use technology (Spotts, 1999; Zayim et al., 2006).

Reliability. Reliability is defined as "the trustworthiness to do what the system is expected or designed to do" (PCmag.com, 2019, para. 1). Whether or not technology will perform when needed is a concern to faculty (Butler & Sellbom, 2002). Also, Butler and Sellbom's (2002) study of faculty at Ball State University's College of Sciences and Humanities found that "the biggest problem with using technology for teaching is reliability" (p. 23). Faculty members tend to not adopt technology that does not work properly during class teaching presentations (Spotts, 1999).

Tenure concerns. Tenure is a major concern that occupies faculty attention (Crawford & Gannon-Cook, 2002; Spotts, 1999). Faculty may be reluctant to adopt technologies in their teaching because of existing time demands associated with tenure concerns (Crawford & Gannon-Cook, 2002; Spotts, 1999). Furthermore, faculty members are reluctant to adopt technology because the time to learn technology is time taken away from scholarship and earning tenure, appointment, and promotion (Spotts, 1999; Zayim et al., 2006). Also, faculty members may be more inclined to adopt technology in their teaching if universities were to consider instructional activities as a factor in promotion (Spotts, 1999; Zayim et al., 2006) and tenure (Spotts, 1999).

Inadequate training. Another reason faculty do not adopt technologies is because some faculty do not understand or know how to use technology (Jarvis, 2010; Kent, 2004; Prensky, 2001; Spotts, 1999; Strauss, 2005). Also, inadequate training to help faculty members learn how to use technology in their teaching is a barrier to adoption of technologies in teaching (Brace & Roberts, 1996; Carr, 1999; Jacobsen, 1997; Spotts, 1999; Zayim et al., 2006). Faculty members will tend to decline to adopt technology in their teaching when the focus of the technology training is on how to operate the technology as opposed to how to integrate the technology into teaching and learning (Spotts, 1999).

Lack of institutional support. Institutional support (Butler & Sellbom, 2002; Jacobsen, 1997; Spotts, 1999) and funding (Butler & Sellbom, 2002; Jacobsen, 1997, 1998; Zayim et al., 2006) for integrating technology into teaching is lacking, and this may contribute to faculty not adopting technology in their teaching. Also, technology is expensive, and campuses usually need to invest millions of dollars to integrate and support technology into teaching on campus (Benson, 2005). Another reason faculty do not adopt technology in their teaching is because

universities do not purchase enough technology devices for faculty members and students to use in teaching and learning (Spotts, 1999; Zayim et al., 2006). Also, lack of a university reward system for the adoption of technology is another reason faculty do not adopt technology in their teaching (Jacobsen, 1997, 1998; Spotts, 1999; Zayim et al., 2006).

Skepticism of technology's impact on student learning. Whether or not technology positively impacts student learning is another concern to faculty (Brace & Roberts, 1996; Lang, 2007). Consequently, faculty skepticism of technology's impact on student learning may deter faculty from adopting technologies (Butler & Sellbom, 2002; Jarvis, 2010; Lang, 2007). Beynon (2007) argued that technology used in schools does not positively impact student learning. Furthermore, Lang (2007) said she was not convinced that teaching fundamental skills to students would be improved by integrating technology into her teaching. However, more teachers might adopt technologies if they had more control over the type of technology used in their class, and teachers should have more say in educational software development (Beynon, 2007). Also, Lang argued that not all students learn from teaching with technology, so faculty should be aware that integrating technology into their teaching may not benefit all students.

Lack of technical support. Technology support staff is also a concern to faculty (Brace & Roberts, 1996; Spotts, 1999). Some faculty found a lack of technical support on their campuses (Brace & Roberts, 1996; Spotts, 1999). The lack of technical support to help correct technology problems during class tends to discourage faculty members from adopting technology in their teaching (Spotts, 1999). Therefore, lack of technical support on campus is another reason why faculty may not adopt technologies (Brace & Roberts, 1996; Spotts, 1999).

Framework for Understanding How Individuals Adopt New Technology

I found three possible theories based on a review of the literature. According to Sahin and Thompson (2006) and Soorma (2008), the concerns-based adoption model (CBAM; Hall & Hord, 1987) is frequently used to study the innovation adoption process. The CBAM helps explain the change process involving individuals, individuals' concerns, and organizations (Hall & Hord, 1987). Also, according to Sahin and Thompson, social learning theory (Bandura, 1977) is widely cited and helps explain human interactions and experiences that impact how innovations are diffused.

Diffusion of Innovations

The diffusion of innovations theory is helpful to explain how and when individuals adopt innovations and how an innovation is communicated to other members in a social system (Rogers, 2003). According to Casanovas (2010) and Sahin and Thompson (2006), the diffusion of innovations theory is most often cited as a theoretical framework to help explain individual's technology adoption in higher education. According to Rogers (2003), there is a process that individuals experience when deciding whether or not to adopt an innovation. Rogers' (2003) innovation-decision process involves five steps: "(1) knowledge, (2) persuasion, (3) decision, (4) implementation, and (5) confirmation" (p. 20). Not all individuals will adopt the innovation, and individuals' attitudes toward and perceptions about the innovation tends to impact the individuals' innovation-decision process (Rogers, 2003). Also, Rogers (2003) said, "The innovation-decision period is defined as the length of time required to pass through the innovation-decision process" (p. 21).

Rogers' (2003) diffusion of innovations theory and, specifically, the perceived attributes of innovation and their rate of adoption is the theoretical framework used in this study to help explain how faculty develop attitudes and behavior toward podcasting as a teaching tool in

higher education and to provide a context for faculty adoption of podcasting as a teaching tool in higher education. The perceived attributes of innovation components are relative advantage, compatibility, complexity, trialability, and observability (Rogers, 2003). Also, the diffusion of innovations theory is employed as the theoretical framework for this study because it helps to explain why individuals do and do not adopt innovations. These attributes are described below.

Relative advantage. Relative advantage is defined as "the degree to which an innovation is perceived as better than the idea it supersedes" (Rogers, 2003, p. 229). Indeed, faculty perception of an instructional technology's value may influence faculty adoption of the instructional technology (Agbonlahor, 2006). Therefore, faculty may replace one instructional technology with a new instructional technology when they perceive that the new technology performs better than the existing one, with respect to a quality valued by the faculty (e.g., efficiency).

Compatibility. Compatibility is defined as "the degree to which an innovation is perceived as consistent with the existing values, past experiences, and needs of potential adopters" (Rogers, 2003, p. 240). Here, faculty may adopt a new instructional technology that facilitates evidence of student learning or more opportunities for student learning in accordance with faculty values to promote student learning.

Complexity. Complexity is "the degree to which an innovation is perceived as relatively difficult to understand and use" (Rogers, 2003, p. 257). In higher education, faculty members have many time-consuming demands, such as tenure (Crawford & Gannon-Cook, 2002), and faculty may not have time to understand a difficult instructional technology. Consequently, faculty may be more likely to adopt a new instructional technology that is not difficult.

Trialability. Trialability is defined as "the degree to which an innovation may be experimented with on a limited basis" (Rogers, 2003, p. 258). Therefore, faculty may be more likely to adopt a new instructional technology if they first use the instructional technology on a trial basis to determine if it is suitable for the faculty members' academic needs.

Observability. Observability is defined as "the degree to which the results of an innovation are visible to others" (Rogers, 2003, p. 258). Here, faculty may be more likely to adopt a new instructional technology if they first observe the instructional technology being used by other faculty members. Consequently, faculty trainings, workshops, and conferences offer faculty opportunities to observe new instructional technologies being used by other faculty.

Literature Review Summary

When reviewing the literature on the history of instructional technology, whether about early technology or in the newest technology, the themes that emerge include increased student interest, increased student engagement, increased student learning, contribution to academic research, increased clarity in teaching, improved teaching efficiency, enhanced teaching and learning, flexibility, and active learning. Some faculty members also believe that instructional technology can be a useful tool to help students learn. Also, instructional technology tends to increase student interest in courses. Consequently, today's students may be more interested in a class that incorporates instructional technology because they are comfortable with and interested in using technology.

Additionally, instructional technology tends to contribute to academic research, enhance teaching and learning, and improve teaching efficiency. For example, computers and the Internet have made it easier and faster to access scholarly articles and research studies that students and faculty need to conduct academic research. Computers and the Internet have improved teaching

and teaching efficiency because faculty may now spend less time preparing course assignments on a computer as opposed to preparing course assignments with pencils, pens, and paper; furthermore, clickers and Second Life offer more opportunities for students to learn and receive instruction from faculty. Faculty may now instantly deliver course assignments and feedback to students using e-mail instead of waiting to use written or verbal methods during class.

Instructional technology also tends to increase clarity in teaching and provide more flexibility and active learning. For example, faculty can increase clarity in teaching by providing podcasts of class lectures to students. Students may review the podcast lectures after class to increase their understanding of course subjects. Furthermore, podcasts provide students with increased flexibility in learning because students can access podcasts via multiple locations, including computers, iPods, and MP3 players. iPods and MP3 players also promote mobile learning because students can listen to podcasts on their iPods or MP3 players at any place and time. Also, clickers and asynchronous learning promote active student learning with additional opportunities to actively participate; for example, students may easily use a clicker to interact in class, and they may easily participate in asynchronous learning by engaging in online discussions using a course management system.

In general, faculty motivation for new technology is based on their belief that the technology has a value or benefit to their teaching and to student learning. Also, faculty tend to adopt technology when there are sufficient opportunities for technology training. One important recommendation for universities interested in increasing faculty adoption of technology in teaching and learning is to focus more on the different needs of faculty members with respect to support and development (Zayim et al., 2006). Also, faculty will tend to not adopt technology when they do not understand technology or do not have sufficient technology training

opportunities and technical or institutional support. Furthermore, faculty will tend not to adopt technology when they believe the technology is not reliable or does not improve student learning, or when they perceive the technology as time consuming and interfering with the time needed to spend on tenure track activities. Whether faculty do or do not adopt new instructional technologies can depend on the individual faculty members' perceptions about and attitudes toward technology, as well as faculty members social backgrounds and psychological constitution.

Chapter 3: Methodology

The purpose of this study was to analyze the perceived benefits and constraints that California community college instructors face when adopting podcasting in their classroom teaching. Four research questions were posed in this study.

1. Why have some community college faculty in California decided to adopt podcasting in their classroom teaching?
2. What constraints did these instructors perceive to the adoption of podcasting?
3. What benefits did faculty perceive about the adoption of podcasting?
4. How did faculty use podcasting?

The critical components of this study design are described in this chapter. First, the qualitative research methodological approach to this study is discussed. Next, the multiple case study methodology is explained. This chapter then discusses the study participants, data collection process, and data analysis procedures. Next, data confirmation to ensure trustworthiness is clearly illustrated. Finally, the limitations of this study are explained. The following section describes my qualitative research approach.

Approach

This study used qualitative research. Qualitative researchers aim to understand and interpret phenomena based on participants' perceived meanings of phenomena (Denzin & Lincoln, 2003). Qualitative research fits the context of people's perceptions (Lawrence, 2015; Patton, 2002; Stake & Munson, 2008). Also, qualitative research tends to be fluid (Creswell, 2003). Therefore, the changing nature of qualitative research attaches some benefits and challenges. In this study, a collective case study method was used to answer this study's research questions. This qualitative multiple case study approach examines and explains the procedure of

adaptation of community college faculty via qualitative data collection and data analysis. In the next paragraph, I discuss my interpretivist approach.

An interpretivist approach to qualitative inquiry seeks to understand the subjective meanings of human action (Hiller, 2016; Schwandt, 2003, 2007). Because higher education faculty tend to have diverse opinions in their teaching activities (AAUP, 1940), I employed an interpretivist approach to learn how participants experienced teaching with podcasting and to understand the meanings participants experienced (Hiller, 2016; Schwandt, 2003, 2007). The interpretivist orientation captures each case through the lens of participants' multiple viewpoints and interpretations (Yin, 2014).

Also, the interpretivist approach examines how each participant perceives a phenomenon and may give rise to multiple realities (Hiller, 2016; Yin, 2014), which are considered multiple sources (Yin, 2014). From an interpretivist perspective, understanding the subjective meanings of human action can be accomplished in an objective way (Schwandt, 2003, 2007). Although an interpretivist approach is similar in some ways to a constructivist approach, there are significant differences. Both interpretivists and constructivists hold that, to understand phenomena, the researcher needs to interpret the phenomena; however, both pursue different approaches to qualitative inquiry (Schwandt, 1998, 2003). A constructivist approach to qualitative inquiry argues that one's perspective reveals an objective understanding of truth and knowledge because the mind creates truth and knowledge as opposed to discovering truth and knowledge (Phillips, 2000; Schwandt, 1998, 2003, 2007). Conversely, an interpretivist approach finds understanding of truth and knowledge based upon participants' subjective interpretations of phenomena (Hiller, 2016; Klein & Myers 1999; Orlikowski & Baroudi 1991; Schwandt, 2003, 2007; Wynn & Williams, 2012). The methodology of this study is further described next.

Methodology

This study employed a qualitative multiple case study research design (Yin, 2014). Embodied in a constructivist viewpoint, qualitative case study research seeks diverse realities and aims to explore phenomena from participants' perspectives (Creswell, 2003; Hiller, 2016; McMillan & Schumacher, 2010; Merriam, 2009; Stake & Munson, 2008; Yin, 2014). Case study is an in-depth, complex explanation and examination of an individual unit using comparative and inductive analysis (Merriam, 2009). Case studies may be conducted using a variety of research methods and evidence including observations, ethnographic work, statistical work, historical work, survey work, verbal reports, archival records, fieldwork, or a blend thereof (Morgan, 2012; Yin, 1981). Furthermore, case studies do not limit the researcher to any specific method of data collection (Yin, 1981).

Described concisely, case study is a research method to examine modern phenomena within a bounded system in a specific setting (Merriam 2009; K. Murphy, 2016; Yin, 1981, 2014). This research involves individual faculty members in a single case study; each bounded unit in this multiple case study was a California community college faculty member who was teaching students with podcasting instructional technology. Each bounded unit informs how faculty do or do not adopt podcasting as a teaching tool and the manner in which they use podcasting to enhance teaching.

According to Stake (2006), the process for conducting multiple case study research starts with individual analysis of each case first and before conducting cross-case analysis. To that end, I first examined and documented the cases individually prior to conducting cross-case analysis. This study contained a plurality of faculty members involved, which demonstrates

qualitative multiple-case study research (Yin, 2014). Multiple case studies embody studies that analyze several cases, as is the case here (K. Murphy, 2016; Yin, 2014).

Replication is an important aim in research because it helps future researchers to further study and contribute to learning and informing about a phenomenon (Yin, 2014). Studying California community college faculty adaptation to podcasting as a teaching tool met this goal by researching similar cases. Furthermore, multiple case study design has often been used to study how teaching institutions adopt innovations (Merriam, 2009; Yin, 2014). Lessons revealed from these cases should inform how and why other faculty members do or do not adopt similar emerging teaching technologies and the manner in which they are used to complement teaching in higher education. The antitheses of single cases, multiple case studies are grounded in designs that seek knowledge from replication (Eisenhardt, 1989; Eisenhardt & Graebner, 2007; Wrona & Gunnesch, 2016; Yin, 2014). In multiple case studies, each case exists as a bounded unit to be analyzed individually (Eisenhardt & Graebner, 2007). This study aligned with a multiple case study approach to examine and explain how California community college faculty adapt to changes in technology. Next, the research methods are described.

Methods

Interviews were used to study California community college faculty adoption of podcasting as a teaching tool in higher education using Rogers' (2003) attributes of innovations, and specifically, the perceived attributes of innovation and their rate of adoption, as the theoretical framework. I first conducted structured e-mail interviews followed by semi-structured telephone interviews of the participants. I designed the interview questions to obtain rich information from respondents. The e-mail interview questions were based on the characteristics of early innovators because these interview questions should set the context of the

participants. The e-mail interviews contained 49 questions. Also, the last question in the email interview encouraged participants to provide additional critical information that informs their decision to adopt podcasting in their teaching. The telephone interview questions were designed to inform how the participants learned about podcasting by using both open- and close-ended questions to collect data. The telephone interviews ranged from approximately 20 to 50 minutes each, and they were transcribed; the transcribed telephone interviews ranged in length from six to 17 pages long. Patton (2002) identified open-ended interviews as helpful in learning about participants' perceptions. In the next paragraph, I describe the focus of the interview questions.

Both the e-interview and telephone interview questions were focused on the participants' innovation-decision process with respect to the adoption of podcasting in their teaching. The e-interviews also contained demographic questions. Additionally, the telephone interview questions contained follow-up questions that varied depending on the participants responses to initial telephone questions. The e-interview questions included questions on participants' perceptions about podcasting with respect to relative advantage, compatibility, complexity, observability, and trialability.

Participants were identified in this study by a number and pseudonym, and their respective colleges were identified by a pseudonym to provide confidentiality. Participants were first emailed an informed consent form and e-mail interview questions. A copy of the informed consent form is included in Appendix A. A second e-mail request was sent to participants who had not responded within 1 week. Finally, a telephone call was made to participants after they had responded. Also, a second telephone call was made to individuals who had not responded within 2 weeks, and I encouraged participants to participate in this study (Bampton & Cowton, 2002).

All interview questions were grounded in the literature and prior research to provide methodical data that are reliable. The e-mail interview and telephone interview questions are shown in Appendix A. The interview questions were both open- and close-ended. Also, the e-mail interview provided a transcription for all interviews to ensure accuracy of data and to facilitate critical analysis. Telephone interviews followed the e-mail interviews. I telephoned all sampled individuals for this study. The telephone interview questions were both open- and close-ended. The telephone calls were recorded using digital technology, and transcripts were created from the telephone calls. Furthermore, upon completion of the dissertation, I deleted all records of the e-mail interviews to ensure confidentiality. The participants are described next.

Participants

Of the 29 possible participants, one was retired, one was excluded, six declined to participate, 14 did not respond to invitations to participate, and seven participated in this study. Thus, the participants in this study were seven instructors from six California community colleges who had uploaded podcast files into iTunes as part of their classroom teaching. This research was conducted by searching iTunes for the names of all of the California community colleges using the California community college directory found at the Community College League of California's website. I identified potential participants by searching through iTunes for every California community college and selected faculty members when one or more faculty members from a college had uploaded podcasts into iTunes; this method revealed that some faculty members were using podcasting in their teaching. I completed a search of iTunes and found that 29 instructors from 21 California community colleges had uploaded educational podcasts in iTunes. My participation decision rule required at least six faculty members to respond to interview questions in this study, and it is justified because in qualitative research,

rich and valuable information from small sample sizes has produced deep understanding (Patton, 2002). Also, qualitative research studies have been conducted with a sample size of one (Patton, 2002).

The rationale for selecting California community colleges for the population sample was because of the importance of community colleges in higher education. According to the National Student Clearinghouse Research Center (2015), 46% of 4-year degree college graduates in 2014 had attended a community college within the past 10 years. Further rationale for selecting faculty members as research participants was because faculty are those who use podcasting as a teaching tool in colleges.

Furthermore, I exercised due diligence to obtain the highest response rate from this sample as possible, and the participation decision rule was met in this study. Additionally, a large sample size is more important in quantitative studies where there is much less rich information as compared to qualitative research. It should be noted that, originally, I thought there were eight participants; however, one respondent was excluded from this study because, upon interviewing, the faculty member did not use podcasting to teach students and was found to only have used podcasting in their dual role as an instructional technologist teaching faculty about available technologies. Therefore, the eighth respondent was excluded from this study because, according to Yin (2014), the cases contained in a multiple case study should be similar to help enable the goal of replication. Consequently, the reasoning and sources cited here justify my participation rule to require at least six faculty members to participate in this study.

I searched iTunes, a public-accessible website, for California community college instructors using podcasting in their teaching. iTunes (2008) is defined as “a digital media player application, introduced by Apple on January 10, 2001 at the Macworld Expo in San Francisco,

for playing and organizing digital music and video files" (para. 1). Also, in 2005, iTunes was modified to accommodate podcasting (iTunes, 2008). Within iTunes, faculty members can upload and distribute their podcast files to complement college coursework (iTunes, 2008). I searched iTunes to identify the sample population for this study. However, it should be noted that there are several other podcast websites where individuals may upload podcasts; nevertheless, I did not find any California community college faculty members who had uploaded instructional podcasts into any of these websites that were not previously found by searching in iTunes; these other websites are listed in Table 1.

Table 1: Podcast Websites

Podcast Websites	California Community College Faculty Instructional Podcasts Found
http://www.phonecasting.com/	None
http://podcastalley.com/	1 (Found previously in iTunes)
http://www.podomatic.com	None
http://www.ipodobserver.com/	None
http://www.podtech.net/home/	None
http://www.podcast411.com/index.html	None

Furthermore, faculty may upload instructional podcasts into course management system accounts, such as Blackboard or Angel Learning. However, these sites are private course websites, and I had no way of reviewing these sites. Also, using iTunes to identify this sample population is not too limiting because I was able to search iTunes to identify faculty members who were using podcasting in their teaching for this study. The participants are described in Table 2.

Table 2: Participant Demographics

Name	Gender	Age	FT or PT	Field	Time Teaching	Time Teaching With Podcasting	Frequency Teaching With Podcasting
#2 Carl	M	56	Full-Time	Journalism and Mass Media	31 years	Very little. less than one year	Not much
#3 Simon	M	55	Full-Time	Film/ TV Production	8 years	2 years	A few times per month
#8 Jason	M	45	Part-Time *also admin	English	20 years	5 years	A few times per month
#12 Gary	M	65	Full-Time	U.S. History	10 years	2 years	Each semester
#23 Jill	F	41	Full-Time	Office Administration	10 years	13 years	Once per week
#25 Dan	M	42	Full-Time	Chemistry	18 years	2 years	Once per week
#28 Tim	M	52	Full-Time	Computer & Library Science	14 years	3 years	Six to nine times per semester

The average teaching experience of participants was 15.9 years. The most experienced instructor had 31 years of teaching experience, while the newest instructor had been teaching for 8 years. One participant was a journalism/mass media instructor with 31 years of teaching experience. Another taught film/television production courses with 8 years of teaching experience. One was an English instructor who had been teaching for 20 years. Another participant taught U.S. history with 10 years of teaching experience. One instructor taught office administration courses and also had 10 years of experience teaching. There was one chemistry instructor with 18 years of teaching experience and one computer science and library science instructor who had been teaching for 14 years.

Also, the length of time that participants had been teaching with podcasting varied from very little time to 13 years. The most experienced instructor (31 years) had been teaching with

podcasting for a very little amount of time. Whereas, the participant who had the most experience teaching with podcasting (13 years) had been a college instructor for 10 years. The average time participants had been teaching with podcasting was about four years. The participants' frequency teaching with podcasting also varied from "not much" to once per week.

The two participants who most frequently taught class with podcasting did so at least once per week. The next two frequent podcasting participants did so a few times per month. This was followed by one participant who taught with podcasting six to nine times per semester. Another participant taught with podcasting at least once per semester. Finally, one participant, the most experienced instructor (31 years), was also the participant who reported the least frequency teaching with podcasting in class ("not much"). In the next paragraph, I discuss data collection procedures.

Data Collection

Interviews were conducted to obtain data. I interviewed faculty members seeking to draw out their unique perspectives about the characteristics of podcasting as a teaching tool in higher education (Yazan, 2015; Yin, 2014). Confidentiality was employed by identifying each college with a number. Also, each sampled individual was identified with a number. First, e-mails were sent to 29 faculty members I found using podcasting in their teaching at 21 California community colleges. These instructors were found after a thorough search of iTunes for instructors who had uploaded podcasts for students enrolled in courses at each California community colleges. Next, emails were sent to each individual in the population sample, explaining that they had been selected for this study and requesting their diligent participation in this study. Participants were sent e-mail interview questions with a request to respond within 5 days. Of the 29 individuals in the population sample, three declined to participate, 18 did not

respond, one was excluded, and seven participated in this study. The open- and close-ended questions encouraged participants to disclose information about their perceptions, attitudes, and behaviors about instructional technology use and, in particular, about podcasting as an instructional technology. I then examined participants' responses and made notes about the e-interviews.

Next, I conducted telephone interviews of participants. Interviews helped me to gather data and identify themes present that described faculty as individuals and why they were using podcasting in their teaching. The telephone interview questions were both open- and close-ended questions to encourage participants to disclose information about their perceptions, attitudes, and behaviors about instructional technology use and, in particular, about podcasting as an instructional technology. I made notes during and after the telephone interviews. Furthermore, the interview method was used for this study because this was a descriptive study and because I wanted to learn about how and why faculty are using podcasting as a teaching tool in higher education. Next, data analysis is explained.

Data Analysis

This study employed a framework based upon the ideas of Patton (2002) and Creswell (2003), as well as thematic coding and analysis. The framework was designed to inform my research in the following manner: I used the framework to conduct a reliable methodical review that illuminated, interpreted, and categorized the data. The framework used for each faculty member in this study is described next.

First, I reviewed the four research questions. Next, I arranged and categorized the data in each case based on thematic coding and analysis by noting commonality in passages, terms, and phrases. I reviewed data from each e-mail and telephone interview and organized the data into a

typology. Next, I reviewed the data. Reviewing data, research questions, and my notes resulted in increased understanding. The data were reviewed by reading and re-reading the data. This data review produced common themes by coding the data and searching through the data for commonality and by reviewing my notes. Creswell (2003) stated that coding is an essential system of data organization into ideas prior to making meaning of the ideas found in the data. Next, I noted the ideas derived from the data and used a classification system to organize ideas (Patton, 2002).

Following coding of the data, I created a specific description illuminating the adoption process used by each faculty member. This description was created using specific details elicited from faculty members from each college with respect to their adoption process (Creswell, 2003). My next step was to interpret the data. I demonstrated an understanding of the data with themes found from the data by showing how and where the data were connected or correlated. Also, I created visual aids, including classification charts, to show how themes were clearly related. I then found meaning in the themes and how they did or did not answer this study's research questions. Next, I prepared to inform the academic community of what new knowledge was derived from this study (Patton, 2002). Next, I validated the findings.

Trustworthiness

Trustworthiness is defined as "the credibility, transferability, dependability, and conformity of an interpretivist research study" (Wheeler & Murphy, 2016, p. 747). To confirm trustworthiness of the data, I reviewed the e-mail interview and telephone data to establish themes (Creswell, 2003). All of the e-mail interviews were stored and printed. Also, the telephone interviews were transcribed and printed. Furthermore, to verify the accuracy of the e-mail interviews and telephone interviews, I prepared interview notes throughout the course of the

e-interviews and telephone interviews. Next, triangulation was conducted to further validate the data by combining email interviews, telephone interviews, reflections on the data, and my interview notes to verify the data. According to Patton (2002), triangulation "strengthens a study by combining methods" (p. 247). Upon completion of individual faculty member analysis, I conducted analysis across all participants to seek themes and common patterns found among individual faculty members and then aggregated these themes (Patton, 2002). Trustworthiness was achieved by (a) examining the data and identifying themes from e-mail interviews, (b) examining the data and identifying differences from telephone interviews, and (c) reflecting on the data and my interview notes to verify the data.

Limitations

Five limitations are noted in this study. First, the research focused on California community college faculty. The data collected were from faculty at diverse community colleges, and this study's results illuminated why and how faculty adopt podcasting community colleges but may not be generalizable to all faculty in higher education, since faculty at public or private universities were not included in this study. Second, this study is limited to California community college faculty found to have posted podcasts for their classes in iTunes. Consequently, it is possible that some California community college faculty may not post their class podcasts in iTunes, and these faculty members would not be included in this sample. Third, since interviews are the data collection method in this study, the interviews are subject to interview bias. Fourth, I did not interview participants who were interested in using podcasts in their teaching but had not yet adopted this technology. Fifth, the data for this study are 10 years old and were obtained in 2008. The researcher exercised due diligence in conducting all

interviews in an unbiased fashion; however, Patton (2002) noted that bias is present in individuals because of individuals' personal experiences and prior knowledge.

Assumptions

Two assumptions embodied this study. First, it was assumed that faculty members were willing participants in the study and would participate in interviews. Second, it was assumed that the participants would provide truthful and accurate responses to interview questions in this study.

Summary

This chapter described the research design used in this study. First, use of an interpretive approach to qualitative multiple case study research was substantiated. This was followed by an explanation of interview methodology and sample selection. The data collection procedures used in this study were then described. Next, the data analysis was described. Finally, the assumptions and limitations for this study were explained. In Chapter 4, I discuss the results of this study.

Chapter 4: Results

The purpose of this study was to analyze the perceived benefits and constraints California community college instructors face when adopting podcasting in their classroom teaching. Four research questions were posed in this study:

1. Why have some community college faculty in California decided to adopt podcasting in their classroom teaching?
2. What constraints did these instructors perceive to the adoption of podcasting?
3. What benefits did faculty perceive about the adoption of podcasting?
4. How did faculty use podcasting?

This chapter describes the findings of this study.

Before data collection and conducting any interviews, the Institutional Review Board (IRB) of University of the Pacific approved this research study. The IRB committee conducted a review of this proposal to verify compliance with federal regulations that govern research with human subjects to ensure ethical research principles were adhered to. All participants responded with consent to participate in this research study. The findings were retrieved from data analysis of participant responses to e-mail and telephone interviews after participants responded to an e-mail letter of introduction that included an informed consent form and structured e-mail interview questions (see Appendix B). The e-mail interviews were then followed up with semi-structured telephone interviews to seek more information from participants. The interviews were digitally recorded and transcribed to collect responses and to assist with analyzing the data. Some participants only participated in e-mail interviews or telephone interviews due to participant time constraints, and some participants participated in both e-mail and telephone interviews as noted in the case descriptions in the following paragraphs. The findings of this

research study are presented as follows: First, case descriptions for each case are presented. Next, the cross-case findings are presented in the context of the research questions and themes. Finally, a summary of the findings is presented.

Case Descriptions

Case descriptions of the seven cases are presented to provide a context for the data when viewed through each case. Each of the following case summaries were created by analyzing the data from e-mail interviews, telephone interviews, reflections on the data, and my notes.

Participant 2 – Carl. Carl is a 56-year-old male and a full-time college instructor at a Southern California suburban-serving community college. Carl has taught journalism and mass communication for 31 years and is the instructor with the most teaching experience in this research study. Carl has been teaching with podcasting for less than 1 year, and he is the instructor with the least amount of experience teaching with podcasting. Carl's frequency teaching with podcasting has been minimal. Carl uses podcasting in his teaching by recording class lectures and then making the podcasts available for students to download from an online website. Both the e-mail and telephone interviews with Carl revealed that he is an instructor who is pressed for time when it comes to creating podcasts for his students because of the requirement to provide transcripts for hearing-impaired students; this constraint has led him to minimally use podcasting in his teaching even though Carl expressed that he believes there is great potential for podcasting as a teaching tool to help improve teaching performance and increase student learning.

Furthermore, Carl expressed that if he had the time, then he would invest more time in creating more interesting and engaging podcasts:

> The really effective podcasting is when I take the time—when I take all those lectures that I have, and I break them up into smaller pieces and try to add some additional content in there and maybe even some ambient sound that is designed to help reinforce what's going on and that is going to take a lot more planning.

Carl expressed that some of the significant benefits he perceives for podcasting are the ability to time-shift education to accommodate students' schedules, as well as meeting the learning needs of aural learning students and offering an alternative mode of instruction for students with different learning styles. For example, Carl said, "I think there are incredible possibilities for podcasting, both in making me a better teacher and in helping students learn. I just have not had enough time to do as much." Carl also said podcasting could be used to demonstrate student understanding of course material:

> These new ways of engaging the students to get away from the old style of always writing term papers or always writing essays or even always taking a test. Do you have an understanding—the test is really a way of seeing if you have an understanding of the material. And there are different ways for the student to demonstrate an understanding of the material and podcasts are new and sexy and you can use them over again in a variety of different ways, so I see lots of potential in there.

Carl added that the issues of time demands and accessibility for hearing-impaired students that make adopting podcasting a complex decision.

Participant #3 – Simon. Simon is a 55-year-old male and a full-time college instructor at a Southern California suburban-serving community college. Simon has taught film and television production for 8 years and is the instructor with the least teaching experience in this research study. Simon had been teaching with video podcasting for 2 years, and his frequency teaching with podcasting is a few times per month. Both the e-mail and telephone interviews with Simon revealed that he is an instructor who perceives himself to be highly technically competent, and he perceives podcasting to be a very easy technology to learn. Simon's podcasting experience is a joint venture with his students; for example, Simon teaches his

students to make QuickTime movies as part of their student work on film and television production projects, and then he transforms his students' QuickTime movies into video podcasts that are easily accessible online via a mobile device, the Internet, or a computer.

Also, Simon is motivated to use podcasting in his teaching because of the ease of accessibility and transportability of video podcasting worldwide on the Internet to deliver instruction that explains a lesson, as well as the ability to review and refer to the video podcasts to help with learning. Simon explained his experience with podcasting:

> My podcasts are somewhat different. They're actually just QuickTime movies, and most of them are, as I put in the questionnaire, most of them are student work because I teach film and television production, the projects that they do, I give them the opportunity to put it up as podcasts and, up to last year, last May or so, we were putting up things without any captioning and according to the school they wanted me to put up their work, anything that's generated by the school, whether its student work or not, to be captioned. So that's a process that is very time consuming and it needs to be done correctly so that it's not a general hit and miss of what's being said on the program. So yes, it's a hindrance, so I haven't really done any podcasts since last May because of that.

Simon expressed that the requirement that he provide captioning for all of his video podcasts is a problem that caused him to discontinue creating video podcasts for the last year.

Participant #8 – Jason. Jason is a 45-year-old male and a part-time instructor, and he also works as an administrator at a Northern California suburban-serving community college. Jason has taught English for 20 years and has been teaching with podcasting for 5 years. Jason's frequency teaching with podcasting is a few times per month. Jason has been teaching at his current college for 18 years; before that, he taught at West Point and then several other colleges part time. Jason acknowledged receipt of the e-mail interview but did not respond to the e-mail interview questions. Jason did respond to the telephone interview and revealed that he uses video podcasting in his teaching to record his lectures, so students can watch the video podcasts to review the material. Jason expressed that video podcasting is beneficial to student learning

and preferable to audio podcasting because visual and aural communication of lessons is a more flexible teaching style.

Jason elaborated on why he believed video podcasting, a form of asynchronous instruction, is a powerful way to teach students:

> Because if I go into a classroom and I say something, you might or might not note it, and then you can't get it, but you cannot recover it except in your notes. Whereas, if I have a lecture or something that you can access via iPod, then you can repeat it and you can also do it in your own time, you could review it when you were getting ready for a final exam rather than just reading notes. So, you can skip through it, you can go back and forth.

Jason also revealed that he often has guest lecturers in his class, and they have a dialogue or debate, and the interaction of two or more instructors on a video podcast tends to be more interesting to students and increases student engagement. Furthermore, Jason expressed that his college's technology support is very helpful to him with podcasting because the college technology resource group produces and posts his video podcasts. Interestingly, Jason was the only participant in this research study who enjoyed this level of technology assistance in creating podcasts for his teaching.

Participant #12 – Gary. Gary is a 65-year-old male and a full-time instructor at a Northern California rural-serving community college. Gary has taught U.S. history for 10 years, and he is the oldest instructor in this research study. Gary has been teaching with podcasting for 2 years, and his frequency teaching with podcasting is at least once per semester. Gary responded to the e-mail interview with brief responses and did not respond to the telephone interview. Gary uses podcasting in his teaching to record his class lectures in his instructional televised U.S. history courses, and then the podcasts are made available to students via a website. Gary expressed that podcasting was a benefit to students in online distance education classes due to "24/7 capability to review previous classes for clarification/confirmation of understanding."

Gary had no technological experience with podcasting prior to being trained by his college ITV staff and Innovation Center, and he expressed that podcasting was easy to use in his teaching because there was nothing to learn, since all support was provided by the college. However, this reliance on the college technology staff to assist with his podcasting led him to discontinue teaching with podcasting in 2008 due to a lack of college resources and staff.

Participant #23 – Jill. Jill is a 41-year-old female and a full-time instructor at a Southern California rural-serving community college. Jill has taught office administration courses for 10 years, and she is the only female instructor in this research study. Jill has been teaching with podcasting for 13 years, and she is the instructor with the most experience teaching with podcasting. Jill's frequency teaching with podcasting is once per week, and she is one of two instructors in this research study with the highest frequency teaching with podcasting. Jill acknowledged receipt of the e-mail interview but did not respond to the e-mail interview questions. Jill did respond to the telephone interview.

Jill uses audio podcasting in most of her classes to record her lectures; however, the main way she uses podcasting in her teaching is to deliver the main points, important concepts, and tips to students for completing class assignments. Also, Jill revealed that she enjoys teaching with technology, and she has been an early adopter of technology:

> I have always enjoyed new technology in general over all. So, on this campus, I've always been either on what's known as the cutting or the bleeding edge on some of the things; so, course-based training, CBTs, I was an early adopter and I tested those out. I've just always liked it and if it suits the student training or student learning in an area, I really want to try it out. So, for example, with podcasting—I thought that it would first of all be interesting for me because it's taking what I think is some established technologies and kind of reworking them in a new way. And then try to work them in a way where you add a presence or a – something to enhance the student's comprehension of the content that's being delivered. So, it's kind of a thing that that's kind of my deal that I like, but it's also something that it has to suit the needs of the student learning too. So, I know that there's a lot of new technologies out there, but you know the one with

> audio—I was hoping to get more of a presence in the class without beefing up the course site with you know video; although, audio can be big too.

Jill perceives podcasting as beneficial to students because of the flexibility of podcasting for review and repetition to provide a sense of instructor presence and to engage and motivate students in class. Jill also expressed that podcasting was helpful to students with various learning styles:

> I think my philosophy overall is to try to make sure that students can get the material in a number of different ways that suits their learning style. So, written text is only one way, audio provides another way and then they have hands-on simulation training in the applications courses. I've got online training and assessment software that they connect to do that and then things like records management, they have online hands simulation packets. So, it ties in very well with looking at multiple learning styles as a way of—you know—hitting them in a number of different ways with the same content.

Jill also said that the requirement to provide transcripts for podcasts for hearing impaired students was a constraint, but she found a solution to the problem of providing transcripts for her podcasts when she applied for and obtained grant funding from "Vocational Educational Technical App – Carl D. Perkins" to pay for

> a transcription service and that was costly, and then I found out that our own campus did it – because they're really pushing 508 compliance, so I said, well if you're pushing 508 compliance, you guys should be doing [transcription] and they had somebody who was willing to step up and do it.

Furthermore, Jill revealed that she has used other technologies in her teaching:

> Well, I was one of the early adopters on our campus when we went to even offering online courses. So, when we first started offering, I was already doing stuff through the free Blackboard site. I was trying things like the Camtasia and the screen capture technologies really early on like – gosh, I don't know how many years ago – when they were very early new programs – doing some screen shots and capture when they weren't – there wasn't any e-pack materials for the applications courses in particular and you know so demonstrating something particularly challenging to students, I'd do a quick little demo in Camtasia, capture that and then stream it up. And that's probably one of the earlier things that I did as well.

Jill also said that she did not receive technology support to help he learn to use podcasting in her teaching:

> Well we didn't really have much (technology support) on our campus. I kind of went on my own and did that, so if I needed help on it – I really – there's no one I can go to per se if I had a problem with podcasting. I sort of – I'm the only one that I know of doing it.

Jill said she learned that podcasting was available for use in college instruction from her own research:

> Well, I'm always reading and keeping up online. It just – I get journals about online learning, I look online at Merlot, which is one site where they've got a lot of things about online learning, I scan books, and I just try to keep plugged in to what's coming down the pike, and I learned more about podcasting through a couple of books that I read after I kind of got the interest and I heard a little bit about podcasting.

The telephone interview with Jill revealed an innovative, highly technically skilled, resilient, and independent instructor using podcasting effectively to teach community college students.

Participant #25 – Dan. Dan is a 42-year-old male and a full-time instructor at a Southern California urban-serving community college. Dan has taught chemistry for 18 years and has been teaching with podcasting for 2 years. Dan's frequency teaching with podcasting is once per week, and he is one of two instructors in this research study with the highest frequency teaching with podcasting. Dan responded to the e-mail interview questions. Dan did not respond to the telephone interview. Dan uses video podcasting in his teaching to help students learn in class and in lab work. Also, Dan revealed that he tends to adopt technology in his teaching:

> Love technology, I guess it began with word processing on IBM XT, what a pain to subscript on the XT. Then, my boss had a Mac Classic and I became a Mac user. Then I learned Cricket graph and CHEMDraw needed to communicate research results, then became a teacher and the MAC is great for graphics in making professional looking exams. Then got into course management software 10 years ago, WebCT. Then CPR (calibrated peer review software, which I had a sabbatical to work on), finally started

> teaching online courses 2 years ago and was unhappy with the silence so got into "Vodcasting."

Also, Dan revealed that he uses video podcasting in his teaching because it makes his online courses livelier, it refreshes him as an instructor, and it helps him reflect on main points and his classroom performance. Dan said he did not have any opportunities for technology support to assist him with podcasting, and he taught himself how to use podcasting in his teaching.

Participant #28 – Tim. Tim is a 52-year-old male and a full-time instructor at a Southern California suburban-serving community college. Tim has taught computer science and library science for 14 years, and he has been teaching with podcasting for 3 years. Tim's frequency teaching with podcasting is six to nine times per semester. Tim briefly responded to the e-mail interview questions. Tim did not respond to the telephone interview. Tim revealed that he tends to adopt technologies in his teaching: "I am using a chat room for classroom discussions and the discussion board features in Blackboard. I also have RSS feeds for my podcasts that students can use within iTunes or another RSS reader."

Tim has also used new technologies, such as online office hours for his students; for example, Tim revealed, "We have used the online office hours at the CCC conference website. It provides a phone line and online chat room for instructors to conduct office hours with students in an online environment." Tim also expressed that he perceives podcasting to be beneficial for his students because podcasting provides opportunity for repetition, additional clarity for students, flexibility for student study time to review class podcasts online, and a new way to reach students. In the following paragraphs, the cross-case findings are presented in the context of the research questions and themes.

Cross-Case Findings

The research questions of this study were addressed by analyzing the participants' interview responses and reflecting on the data and my notes with an interpretivist qualitative research approach through the lens of Rogers' (2003) perceived attributes of diffusion of innovations rate of adoption (PADIRA) framework. Rogers' PADIRA definitions are shown below in Table 3.

The themes in this research study were categorized with a corresponding number and letter: A number corresponds to the research question and a letter corresponds to a theme. For example, Research Question 1 was addressed with Themes 1A, 1B, 1C, and 1D, and Research Question 2 was addressed with Themes 2A and 2B. Identifying the themes according to research questions continued in this pattern. The data in this research study were analyzed and the themes were identified when they were found occurring among the collective case studies.

Table 3: Perceived Attributes of Diffusions of Innovation Rate of Adoption

Perceived Attribute	Definition
Relative Advantage	The extent to which an innovation is superior to a current concept.
Compatibility	The extent to which an innovation is viewed as agreeable with the ideals and beliefs of prospective adopters.
Complexity	The extent to which an innovation is viewed as problematic to discern and utilize.
Trialability	The extent to which an innovation may be practiced and tested to help potential adopter determine if it should be adopted.
Observability	The extent to which the outcomes of an innovation are evident to others.

This section reveals the themes identified in this research study using Rogers' (2003) perceived attributes of diffusion of innovations and their rate of adoption (PADIRA) framework. The seven themes identified in this research using Rogers' PADIRA are: (a) Apprehension, (b)

Flexibility, (c) Organization, (d) Personal Gratification, (e) Student Outcomes, (f) Technological Capacity, and (g) Training. In the following paragraphs, I explain each theme and how these themes answer the four research questions in this research study, as well as which facets of Rogers' PADIRA are contained within each theme. Also, I provide quotes from each participant to reveal how the themes are matched with specific facets of Rogers' PADIRA to answer the research questions.

Research Question 1. The first research question was: Why have some community college faculty in California decided to adopt podcasting in their classroom teaching? Analysis of the data revealed four themes that collectively and singularly addressed RQ1: (a) Theme 1A – Flexibility, (b) Theme 1B – Personal Gratification, (c) Theme 1C – Student Outcomes, and (d) Theme 1D – Training. In the following paragraphs, these four themes are explained, and the research question is answered.

Flexibility. Theme 1A is Flexibility and refers to the wide-ranging benefits participants perceived about their experience teaching with podcasting. This theme contains the attribute of relative advantage.

Relative advantage. All seven participants expressed that they have adopted podcasting in their classroom teaching because they perceived it was easy to use and inexpensive technology that could help students to better manage their education. For example, Carl said, "The use of both videos and podcasts offer the possibility of letting students time-shift their educations to their schedule." Simon stated that it was helpful to have the ability to access podcasts online from "anywhere, anywhere, literally that has a computer with Internet connection." He continued, "And I can say, this is what I do in my classes and these are the students' work." Jason added that podcasts were helpful because students have the flexibility to review and study

the podcasts and, "one of the things—it varies by subject—but one of the things that's very helpful is repetition." Jason also said: "[Students] like podcasting. I mean they all have iPads; they like to listen to that. They can do it, you know on their own time."

Furthermore, Gary expressed that podcasting was helpful to students because of the "24/7 capability to review previous classes for clarification/confirmation of understanding" and helpful to faculty because of "excellent instructor review to check on lecture/seminar pacing, etc. Good for self-reflection/analysis." Jill agreed that podcasting was beneficial because "it was just the ease of using simple, inexpensive technology to get started quickly." She continued, "I think some people are listening better because they can play it (podcast) over and over, they can pause it, look at the materials and then replay it or continue playing it." Also, Dan said podcasting benefits students: "It makes my online course less of a silent movie and personalizes the course. Vodcasts show my online students what I would cover in a traditional on-campus course." Tim added that podcasting was helpful because "it allows students to listen to a lecture multiple times and to time shift and hear a lecture or information when they want to listen." The next theme discussed is Personal Gratification.

Personal Gratification. The second theme is Personal Gratification and relates to the faculty members' perception that podcasting is an enjoyable experience and a tool to help them improve as an instructor and to help their students. This theme contains the attribute of relative advantage.

Relative advantage. Seven out of the seven participants expressed that they enjoyed creating podcasts to help students. For example, Carl expressed that being recognized for using a new technology like podcasting was an enjoyable experience because "the old lecture style is not necessarily the best way to deliver information, and students are tech-savvy today and so you

can stand out in the crowd by being among those that use the technology." Simon added that he enjoyed using podcasting in his teaching because podcasting brings recognition to his college's filmmaking program and to his personal teaching accomplishments. For example, he said the accessibility of podcasting "from anywhere in the world, that accessibility works as publicity for a new program such as (our) college's filmmaking program," and my colleagues "are all envious when [he] tell[s] them people from across the world are looking at these podcasts." Also, Jason expressed that he enjoyed using podcasting in his teaching because it promotes openness and open source technology: "I think when you go to iPods and making that stuff all open and available and not charging anything for it, I think that's just an extension of how education is working in the world today." Jason added that using new technologies can be an incentive to improve as an instructor because "good teachers want to be better teachers," and "the good teachers sign up for [new technologies] and get it and go with it because they want to be even better teachers. The students love it because it has an interactive thing."

Gary revealed he was attracted to podcasting because of the "novelty of the technology," and he was motivated to use podcasting because of "innovation, [podcasting is] conducive to student learning styles," and the capability for "24/7 review by both students and [him]self." Jill expressed that she enjoys using podcasting in her teaching: "I have always enjoyed new technology in general over all. So, on this campus, I've always been either on what's known as the cutting or the bleeding edge on some of the things," and learning how to use podcasting "was pretty easy because it's so fast and so easy and [she] had a lot of fun doing it, so that made it even more . . . quick to grasp and use." Jill further discussed her attraction to podcasting:

> So, for example, with podcasting – I thought that it would first of all be interesting for me because it's taking what I think is some established technologies and kind of reworking them in a new way. And then try to work them in a way where you add a presence or a –

> something to enhance the student's comprehension of the content that's being delivered. So, it's kind of a thing that that's kind of my deal that I like, but it's also something that it has to suit the needs of the student learning too. So, I know that there's a lot of new technologies out there, but you know the one with audio – I was hoping to get more of a presence in the class without beefing up the course site with you know video; although, audio can be big too.

Jill also said she was attracted to using podcasting in her teaching because podcasting motivates students to learn and be engaged:

> I think they are the student benefits and then ultimately as a professor you feel a little bit more validated. In the online environment it's a very different environment – sometimes there's good feedback right away from the students and I think when there is – when students are feeling great about the class and that comes back, I think their more motivated and I think as instructors we become more motivated. So, I think that's one of the big incentives – if you can motivate students and have them really jazzed about – you know – what their getting and that they can get this a little better because they heard this, or they understand better. I think that's motivating also to an instructor to keep you know – to keep plugging ahead because it is also exhausting at times to teach online and keep going. I think that is the biggest incentive – is that you know there is a student benefit that I think we might be getting out of this.

Dan said he enjoys using video podcasting as a teaching tool because "[he] love[s] technology and learning new technology," and video podcasting "allows [him] to work smarter" and also makes his class more personal because "it makes [his] online course less of a silent movie and personalizes the course." He continued, "Vodcasts show my online students what I would cover in a traditional on-campus course." Tim added why he is attracted to podcasting: "You have a digital audio file that can be used on the Internet, in an online course," new technologies provide "new ways of reaching your students," and also because students see value in their podcasts and "feedback from students asking for additional lectures in a podcast format" led him to believe that students were benefitting from viewing their video podcasts. The next theme discussed is student outcomes.

Student Outcomes. The third theme is Student Outcomes and relates to the faculty members' perception that podcasting is a teaching tool that helps students learn or be engaged in coursework. This theme contains attributes of relative advantage and compatibility.

Relative advantage. Four out of the seven participants expressed that they perceive podcasting is a teaching tool that helps students learn or be engaged in coursework; for example, Carl said he is motivated to use podcasting because "you got to do new things to keep the students engaged in things today."

Gary expressed that he uses podcasting in his teaching because it helps student learning with "24/7 capability to review previous classes for clarification/confirmation of understanding," and "technology is a tool to assist in the promotion of learning." He also said, "Podcasting falls into the category of students into iPods, etc. Podcasting fits well into that mindset." Also, Jill said she uses podcasting because she perceives it to be a teaching tool that helps students learn:

> With podcasting, I thought that it would first of all be interesting for me because it's taking what I think is some established technologies and kind of reworking them in a new way, [and] then try to work them in a way where you add a presence or a – something to enhance the student's comprehension of the content that's being delivered.

Dan added that he uses podcasting in his teaching because, in addition to helping students learn, podcasting also helps maintain student engagement in his classes. Jill revealed that she performed an assessment of student success that revealed that students enrolled in one of her classes where podcasting was used as a teaching tool had achieved a minor grade improvement compared to students enrolled in one of her classes where podcasting was not used; she said:

> Well, at least I've found in the last year, its looking like it helps a little bit with student success and by success, at least when I did – when I'm working on this grant, the improvement of student grades from term to term, I looked at one class in the Fall of 2006 and a class in the Fall of 2007, one had podcasting and one didn't; in 2006 the class didn't, in 2007, it did. I found there was a slight improvement in the grades of the students who completed the course. I looked at retention in terms of can I keep more

> students in there? – not retention of the content – but can I keep more students in my class by adding podcasting – I found there wasn't much difference there, but there was a slight improvement in their grades and success of the students who completed, so I think it helps them and I did a subjective survey of my students – they found – they thought it was helping them grasp the content a little better. So, I think that's what their getting out of it.

Jill added that podcasting has improved student learning:

> I think its improved student learning on the outset; it's looking like they feel it's another way to get the content in – so besides reading, doing flashcards, whatever they might have to their fingertips, they also have another avenue they can listen. And I think some people are listening better because they can play it over and over, they can stop it and pause it, look at the materials and then replay it or continue playing. So, I think it helps student learning overall in terms of their content learning.

Dan said he uses video podcasting in his teaching because it helps students learn:

> It helps with student success; my data shows 10-20% improvement in student success, [and] it makes my online course less of a silent movie and personalizes the course. Vodcasts show my online students what I would cover in a traditional on-campus course.

Compatibility. Four out of the seven participants expressed that they perceived podcasting to be a teaching tool that aligns with their teaching philosophy and helps students succeed. For example, Carl revealed that he uses podcasting because he believes that it is important to engage students in class: "I think to, you know, you got to do new things to keep the students engaged in things today." Carl continued: "The old lecture style is not necessarily the best way to deliver information, and students are tech-savvy today, and so you can stand out in the crowd by being among those that use the technology." Also, Jason said he uses podcasting because it provides another way for students to learn:

> Well, they like podcasting, I mean they all have iPods; they like to listen to that. They can do it, you know on their own time. One of the things you learn is that asynchronous instruction is typically more powerful than synchronous instruction and the iPod allows a student to get whatever he or she needs at his or her own convenience and to repeat it if necessary so it's very useful in that regard.

Jill added she uses podcasting because it appeals to students, helps them learn, and increases student engagement:

> Well I think the students like hearing the content. They like hearing – I notice that they don't read a lot of the information that I have in my course sites. I have tons of information about – in the syllabus about you know grading and guidelines and I have tons of information in the course site about the content, but I don't think – I think everybody is so busy there glossing over it really quickly and they're more willing to listen. So, in terms of the feedback I've gotten back from students, they like hearing it because it helps them – I guess another form of comprehension – it helps them take in the information a different way and they like hearing my voice. One student said, "It's just nice to hear your voice and know that you're really there," even though they know I'm there through e-mail and discussion board.

Also, Simon said he started using podcasting "to improve student success," and podcasting has helped increase student engagement because "it makes [his] courses more lively" and "helps with student success; [his] data shows 10-20% improvement in student success."

Training. The fourth theme is Training and relates to the faculty members' experience with training opportunities to learn about using podcasting and whether to adopt podcasting in their teaching to help students. This theme contains attributes of relative advantage, complexity, and observability.

Relative advantage. Four out of the seven participants expressed their perceptions that their training opportunities helped them to learn about podcasting and adopt podcasting in their teaching to help students. For example, Carl revealed:

> I learned about podcasting at professional technology workshops, and as I read more and more saw that it was going to become important for my subject: journalism. . . . As it became more apparent that, in journalism, multimedia skills were going to become important, we started developing courses in it and hosting our own professional workshops.

Carl added that he also received training from his college at a campus forum on incorporating podcasting into teaching:

> I was encouraged on my campus a month ago or so when a psychology teacher on campus, as part of a sabbatical project, developed a campus-wide faculty meeting to discuss/demonstrate the possibilities of incorporating podcasting in teaching and in student learning. Campus forums are good for that, as long as you have a small critical mass of examples.

Jason said he learned how to use podcasting from Apple when they came to his college to provide training on teaching with podcasting and "they did some training for our faculty." Apple convinced him that podcasting "was a good idea for teaching."

Gary expressed that he decided to use podcasting in his teaching after he attended training about "technology offered as a test by the college," and he also learned about podcasting from his "college Innovation Center." Gary also said he benefited from technology support "provided by our ITV staff and Innovation Center," and his college technology support assisted him with "full use of their support." He continued: "I had no technological know-how/expertise on podcasting prior to being trained by the college." Dan revealed that he learned to use podcasting in his teaching with training from a "podcasting workshop at the @ONE Summer Institute and Apple's website," and he also detailed the steps he went through to start using podcasting when he initially began making video podcasts with "QuickTime movies using shareware programs." He continued: "Then [I] went to a training on LiveStage Pro Demo version and was using that for a file and started adding sound. Then attended @ONE Scholars programs on podcasting and read through Apple's website."

Complexity. Five out of the seven participants expressed that they perceived their training opportunities made the learning process easier using podcasting in their teaching to help students. For example, Carl said that podcasting was easy to learn and he "learned about podcasting at professional technology workshops." He continued: "I think that one of the things that we can do for the faculty is continuing to have workshops. It's an education thing. There

needs to be examples, best practices and things like that." Simon said that learning how to use podcasting in his teaching was "very easy," and he received training in an "Apple workshop" that Apple conducted at his college. He continued: "I attended it and found out how easy it was and how much access it provides." Using podcasting in his teaching helps students because "[he is] building a library of podcasts for student reference."

Jason expressed that he learned about podcasting from an Apple workshop when Apple "did some training for our faculty that was sold out; [they] filled up the rooms every time they came." Learning how to use podcasting in his teaching was "very easy." Gary added that learning to use podcasting in his teaching was easy and he received training from his college "via our college Innovation Center," with "the technology provided by the staff," and teaching students with podcasting was easy because "it merely records [his] class and then sends it via the podcasting system for access by subscribers/users." Dan said that it was "easy" learning to use podcasting in his teaching with training from a "podcasting workshop at the @ONE Summer Institute and Apple's website" and that he uses podcasting in his teaching because "it is all about student success."

Observability. Four out of the seven participants expressed that they perceived their training opportunities helped them to see and understand how others use podcasting in their teaching to help students. For example, Carl revealed that he attended a helpful training "a month ago or so when a psychology teacher on campus, as part of a sabbatical project, developed a campus-wide faculty meeting to discuss/demonstrate the possibilities of incorporating podcasting in teaching and in student learning." Carl also expressed he had the opportunity to observe other instructors on campus teaching with podcasting: "One art instructor is into [podcasting] big. The film/video program has produced student work as video podcasts. In

journalism, we're getting started with webcasts and simple podcasts but working to incorporate it more and more as student projects."

Carl added that he is developing partnerships with colleagues on campus to incorporate podcasting into teaching:

> We have a partnership where we teach video storytelling and editing skills in a 1-unit class for political science classes as part of that program's goal to engage students by having them prepare video editorials on different aspects of democracy. They teach political science, we teach the skills to create short videos for those classes.

Furthermore, Carl said that a psychology instructor "already wants to talk about a partnership where she has her students produce podcasts and we use our 1-unit add-on classes to teach psych students how to produce them and how to develop a themed series."

Jason added that when he was beginning to use podcasting in his teaching, he had observed another faculty member using podcasting, and he "watched to see what [the other faculty member) was doing—he was usually the league leader." Also, Jason said that the opportunity to observe other faculty members using podcasting helped him get some good ideas about how to teach with podcasting because "sure, of course, good teachers always share best practices with each other." Jill added that another faculty member at her college was video recording lectures, and "she's doing some video-recorded lectures in her online class." Jill also said she became interested in podcasting when she had an opportunity to listen to other podcasts: "I have an iTunes account – I got interested through listening to other podcasts. I thought it was – you know – pretty nice." Furthermore, Dan also had opportunities to observe others using podcasting: "All the time, just go to iTunes, also saw @One Scholars program training." In the following paragraphs, RQ2 is addressed.

Research Question 2. The second research question was: What constraints did these instructors perceive to the adoption of podcasting? Analysis of the data revealed two themes that collectively and singularly addressed RQ2: (a) Theme 2A – Apprehension, and (b) Theme 2B – Technological Capacity. In the following paragraphs, these two themes are explained, and the research question is answered.

Apprehension. The fifth theme is Apprehension and relates to participants' perception that they are constrained from adopting podcasting in their teaching because of time demands of learning, planning, creating, editing, and preparing transcriptions or captions for podcasts required for hearing-disabled students and because of their perceptions that podcasting requires a lot of additional work or risks. This theme contains attributes of complexity and trialability.

Complexity. Four of the seven participants revealed that the time demands of preparing transcriptions or captions for podcasts, updating course materials each semester, or planning, creating, and editing podcasts was a constraint to their adoption of podcasting. Transcriptions or captions are required by federal government regulations which mandate that educational institutions provide students with disabilities equal access to an education. Because hearing impaired students cannot hear the podcasts, transcriptions or captions are required when podcasts are used in a class. Carl stated that he had not used podcasting a lot in his teaching: "A roadblock is the college's insistence on including transcripts for the hearing impaired." Carl further stated:

> If I know I have a deaf student in my class, I'll do the transcript. But, if I don't know I have a deaf student in my class, I want to say – why should I do the transcripts when I don't know that anybody needs it—it's a lot of extra work. But it's the wrong attitude, you need to make your material accessible – you don't know when people are going to be unable able to access it in the format that you have put it in because you don't have that person to person link, the visual clues and things, so we just have to learn have to do this other stuff – the transcript stuff sounds like a lot of work for me.

Simon also expressed that the requirement of providing captions for the hearing impaired was a constraint to his adoption of podcasting and, in fact, caused him to stop using podcasting in his teaching: "The problem now is that I have to have all of the podcasts captioned [for the hearing impaired]—as a result, I've stopped producing them for the last year. . . . It's the captioning that is time-consuming." Simon added, "It's ironic the fact that now that I've been asked to do captioning so that the hearing impaired can see the podcast, I'm not, because it's such an additional time-consuming step." Dan agreed that the captioning required for podcasts was a constraint to adopting podcasting in his teaching and said, "I am responsible for closed captioning, ADA compliancy, the college places this burden on me." Jill said that the transcript requirement for podcasting was "a huge constraint now" for some faculty, but not for her because she was previously a transcriptionist. She shared,

> I can do it myself, but I can [see] where that could be a huge constraint on any faculty member. . . . I'm providing [transcription] as a need – you know – as the terms for the 508 compliance that we have to give.

Also, Carl expressed that "podcasting will appear to curtail your productivity because of the time involved in preparing quality material," because additional time is required to plan, prepare, and edit podcasts. Jill also said she only uses podcasting "in about half of the classes that [she] teach[es]," because creating the podcasts is "time-consuming." Furthermore, Jill added that podcasting can be a burden due to "the time because [she has] to prep and script." She continued, "The time constraint is that you, you know, need to prepare – now, it's just sort of like a regular lecture but, then there's also the recording time and if you're really picky, there's also editing." Tim agreed that podcasting is burdensome because of time required for "updating

the information each semester, editing the audio file, and after some breaks, re-learning the Audacity software that I use to create the MP3 file."

Trialability. Four out of the seven participants expressed concerns about the time demands associated with planning, practicing, and editing podcasts. Carl stated:

> The really effective podcasting is when I take the time – when I take all those lectures that I have and break them up into smaller pieces and try to add some additional content in there, maybe even some ambient sound that is designed to help reinforce what's going on and that is going to take a lot more planning.

Simon worried that creating lessons as podcasts for students would be problematic due to time demands and said, "I think if I was able to spend time creating lessons as podcasts . . . to generate a follow along type demonstration – that would be even better but that will take a lot of time." Dan added that the time spent practicing creating podcasts was burdensome: "I had to learn and spent many hours by trial and error to find appropriate settings to give fair quality in sound, resolution and file size." Also, Tim expressed concerns about the extra time required to teach with podcasting—for example, "updating the information each semester, editing the audio file, and after some breaks, re-learning the Audacity software that I use to create the MP3 file." The next theme discussed is technological capacity.

Technological capacity. The sixth theme is Technological Capacity and relates to the faculty members' perception that this is a constraint to adopting podcasting because they have too many technological obstacles to use podcasting effectively, or because they lack relevant technology devices or systems on campus to effectively adopt podcasting as a teaching tool. This theme contains attributes of complexity.

Complexity. Five out of the seven participants perceived their college's lack of relevant technology on campus or the technology obstacles they face at their college to be a constraint to

their adoption of podcasting as a teaching tool to help students. For example, Carl expressed that he lacks the technological tools to easily transcribe podcasts for the hearing impaired, and this constraint is a hindrance to his adoption of podcasting:

> A roadblock is the college's insistence on including transcripts for the hearing impaired, [and] while I accept the responsibility for accessibility, I have not yet found affordable and easy-to-use tools that make jumping into podcasting for teaching purposes an attractive option.

Carl added that a lack of computer processing power and computer memory to store podcasting digital files is a hindrance to adoption of podcasting on campus: "You have to have computing power that can process the material. When you are doing [podcasting], you have to have a place to store the material."

Furthermore, Carl said that his college lacks adequate software to automatically transcribe podcasts, which is a constraint to adopting podcasting on campus because it is time consuming for him to create transcripts of podcasts:

> But, I'm convinced that it's just because I haven't found the right piece of software that will do it for me almost automatically. Once I figure out how to do it easily and start doing it, it's going to be second nature – I was working with something last night or this morning technologically and I was thinking back – you know a year ago this stuff scared me, but now I do it every day without even thinking. And I'm just not there with the transcripts yet.

Also, Carl expressed that his college apparently has other priorities that receive college funding instead of instructional technology:

> Limited amounts of money that's available at this point and the state is in a financial crunch and so they are cutting back or rather than expanding. I mean we have the whole situation of if we show a video in a classroom – we have to show it with the subtitles on there because we might have a deaf student in the class. Well you got to do the same thing on line – well, if you get some old videos are something now that money has to be spent to caption those things so that you know you have to spend the money someplace first and some other issues are bigger issues than transcripts or podcast at some point.

Simon expressed that the lack of technology at his college to assist with creating captions for video podcasts is a constraint to his adoption of podcasting: "The problem now is that I have to have all of the podcasts captioned [for the hearing impaired] – as a result, I've stopped producing them for the last year." Furthermore, Gary said that lack of technology software at his college to help with podcasting is a constraint to his adoption of podcasting because his college does not have "technology for the classroom to 'capture' the recording/ staffing." He also said he does not accompany his podcasts with PowerPoint presentations because of a lack of "technology," and he stopped using podcasting in his teaching "in 2008 due to lack of resources and staffing." Jill added that the evolving nature of technology software is a constraint that causes podcasting to be time-consuming because she has to re-record podcasts:

> It's time-consuming and the problem with my field is nothing stays the same. So the problem with when I started podcasting is we were using a previous version of Microsoft Office and then we changed to Office 2007 and so a lot of the content that I recorded, at least for the computer applications courses, needed to be modified greatly or re-recorded because this was a drastic change in Microsoft Office, the ribbon and the different features in Office changed a bit with this new version so I haven't had the time to go back and do that. Now in classes like Records Management, where the content is more static, it doesn't have to change all the time, I can record things in advance and then recycle them and use them later. So, that's the only thing that prevented me from re-doing, or you know doing more, is because I've had to re-record content.

Furthermore, Dan revealed that technological obstacles at his college are a constraint to his adoption of podcasting because of "file compression software and settings." He shared, "I try to compress my files, so they can run as QuickTime movies on a server. All my vodcasts are .mov not .mp3." He continued, "I had to learn and spent many hours by trial and error to find appropriate settings to give fair quality in sound, resolution and file size." He makes video podcasts "at 1MB/minute video." Dan further explained, "My college does not own a streaming server, band width is an issue, this is because my college will not place the mp3 codec on to my

current server, so the server will not read mp3." Dan also expressed other technological constraints he faces at his college because "the college does not own a streaming server" and because "[his] college is dragging their feet to become a member of iTunes-U, which would give us streaming server space with Apple." He continued, "I am still not sure if I have optimized my conditions, plus the college is not always willing to purchase the codecs that I need." In following paragraphs, research question number three is addressed.

Research Question 3. Research Question 3 was: What benefits did faculty perceive about the adoption of podcasting? Analysis of the data revealed two themes that collectively and singularly addressed RQ3. The two themes that answered RQ3 are: (a) Theme 3A – Organization, and (b) Theme 3B – Flexibility. In the following paragraphs, these two themes are explained, and the research question is answered.

***Organization*.** The seventh theme is Organization and relates to the faculty members' perception that podcasting is beneficial because it is a tool to help them clarify, plan, organize, improve, and deliver instruction to students. This theme contains attributes of relative advantage, compatibility, and complexity.

Relative advantage. All of the seven participants expressed that the process of creating podcasts was beneficial because it helped clarify or improve classroom instruction. For example, Carl expressed that podcasting benefits students with more organized lectures and classes and said, "Will a student listen to an hour-long podcast? Many will not. But if you can take that hour lecture and break into 8-10 specific topics and then build lectures around the individual topics, you will find better organized lectures and better organized classes." Simon said that using podcasting has helped improve their teaching and that "clarity of vision in terms of communicating is needed." Also, Simon added that organizing class lectures with podcasting is

beneficial: “I am building a library of podcasts for student reference.” Furthermore, Jason revealed that creating podcasts has improved his teaching “because of the quality of the product that [he] can deliver.” He continued: “You know it’s very up close and personal to have either one of those lectures that I have to make them available to students, [and] you know [video podcasting] is a very, very powerful tool” for teaching students.

Gary added that podcasting helps his teaching because podcasting “supports [his] lecture/seminar style of classroom presentations.” Also, Jill said that she believes podcasting helps her to organize her classes because you have to

> really get your act together in the beginning of the term or right before the term starts and make sure you have the content that you want to podcast already prepared or at least recorded and then you can – you know – stream [podcasts] up or serve them up and then have them ready week by week.

Dan revealed that teaching with podcasting “refreshes [him] and helps [him] to self-reflect on key concepts and [his] own performance in the classroom.” He continued, “Now when I lecture in my mind, I think I am filming myself; thus, I stay very focused and articulate better, [and] it allows me to work smarter.” Furthermore, Tim added that podcasting benefited his teaching: “It made me focus on how I communicated my directions and information to students.”

Relative advantage. Six out of the seven participants expressed that creating podcasts benefits them and students by helping better organize classes. For example, Carl said that using podcasting in his teaching has improved this class organization because he “can take that hour lecture and break into 8-10 specific topics and then build lectures around the individual topics.” He continued, “You will find better organized lectures and better organized classes.” Also, Simon expressed that creating video podcasts benefits students: “I am building a library of podcasts for future students,” and it shows “what the students are doing.” He continued:

> That's the only reason why the podcasts are up for future students or for students that want to go back and see what previous students in a particular class did, [and] that's an opportunity to see the library of work. So that's the main reason.

Jason added that podcasting was beneficial to her teaching and to students because "of the quality of the product [he] can deliver." He shared, "It's a very, very powerful tool for teaching students."

Furthermore, Jason said that "one of the things you learn is that asynchronous instruction is typically more powerful than synchronous instruction." He also shared that "the iPod allows a student to get whatever he or she needs at his or her own convenience and to repeat it if necessary so it's very useful in that regard." Gary added that podcasting benefits his teaching because it "supports [his] lecture/seminar style of classroom presentations." Also, Jill expressed that podcasting helps to organize her lectures because it is "a way of getting key points and the most important tips and hints of completing the assignments to students." Dan agreed that podcasting has improved his class organization because he created "143 vodcasts, all edited [him]self, learned about compression codecs, trial and error compression parameters."

Compatibility. All seven participants expressed that creating podcasts aligned with their philosophy of teaching. Gary added that podcasting aligned with his teaching because "technology is a tool to assist in the promotion of learning." He continued, "Podcasting falls into the category of students are into iPods, etc. Podcasting fits well into that mindset [and] supports my lecture/seminar style of classroom presentations." Also, Jill revealed that podcasting aligns with her teaching style because she is already an organized person and "[her] philosophy overall is to try to make sure that students can get the material in a number of different ways that suits their learning style." Also, Tim said he uses podcasting because it helps students by providing

"the ability to time shift and listen to content multiple times." He also shared, "This also helps with their notetaking."

Complexity. Six out of the seven participants expressed that creating podcasts was easy and helped them to clarify, plan, improve, and deliver instruction to students. For example, Carl said podcasting was easy to learn even though "the technology seems difficult and confusing at first." He continued, "But with just a little practice, you can pick it up easily." Simon added that podcasting was "very easy" to learn at an "Apple workshop," and he transformed the student created QuickTime movies in his television and film production classes into video podcasts after he "purchased Podcast Maker and created podcasts." Also, Jason said that incorporating podcasting into his teaching was easy: "I've always kind of been an early adopter, and I was teaching on television, so one of the things we found was that the material we had prepared for television was fairly easy to convert into a podcast." Jason also said that podcasting was easy for students to learn because "all they do is download and watch it on their iPods, they know all about that." Furthermore, Gary added that creating podcasts was easy because "it merely records [his] class and then sends it via the podcasting system for access by subscribers/users," and students easily access the podcasts from a "website given to students to access the site."

Jill revealed that podcasting was easy for her and students to learn, students access the podcasts "in [her] WebCT course site," and "the link . . . has an icon that reads 'listen'—it doesn't say podcasting because students get confused thinking that they need an iPod to listen to the podcast." Jill added, "The link reads 'listen,' they click that link and then there's a description of the three ways that they can listen." She continued, "They can listen immediately in Windows Media Player, in Lipson and if – I give them instructions on how they can access – if they want to get an iTunes account and that's how they find out." Furthermore, Dan agreed

that podcasting is easy to learn: “I could teach someone the basics in about one hour and a half”; however, podcasting is time consuming due to his desire to produce a better podcasting experience for students, and he makes time available: “I am just not going out on a Friday night, I am video editing and improving on my online courses.” The next theme discussed is Flexibility.

Flexibility. The theme Flexibility relates to the faculty members’ perception that podcasting is beneficial because it is another method to deliver instruction to students with different learning styles. This theme contains the attribute of relative advantage.

Relative advantage. All seven of the participants expressed that podcasting was beneficial because students have varied learning styles and podcasting could help students with their education. For example, Carl said podcasting is beneficial because “students have different learning styles.” He continued, “Few prefer long lectures, but some are more aural than others and this, along with the time-shifting mentioned, can help students learn more.” Simon added that podcasting was helpful because it “allows variations of a project to be considered.” He shared, “My teaching is about storytelling through the use of media.”

Jason expressed that podcasting is beneficial for students with diverse learning styles and “[podcasting] appeals to a variety of learning styles.” He continued, “Different students have different learning styles, and with podcasting, you can get it all. You could get a text, you could get audio, you could get video.” Furthermore, Gary agreed that podcasting was helpful to students because it is “conducive to student learning styles.” Also, Jill said her students believed that podcasting “was helping them grasp the content a little better.” Dan added that podcasting benefits students in his class because, “in [his] online class, they watch [his] vodcast over [his] syllabus for 10 minutes and go for coffee.” He continued, “You would be amazed—they are

more attentive." Tim also said that podcasting benefits students by "reaching a different learning modality of students." In following paragraphs, Research Question 4 is addressed.

Research Question 4. Research Question 4 was: How did faculty use podcasting? Analysis of the data revealed one theme which addressed RQ4. The theme that answered RQ4 is: Theme 4A – Organization. In the following paragraphs, this theme is explained, and the research question is answered.

Organization. The theme of Organization relates to the faculty members' perception that podcasting is a tool to help them clarify, plan, organize, improve, and deliver instructional podcasts and class materials to students online. This theme contains attributes of compatibility.

Compatibility. All seven of the participants expressed that they use podcasting as either audio or video podcasting in their teaching, and they either use podcasting to record their lectures or to deliver key ideas or tips for completing assignments in their classes. For example, Carl uses podcasting in his journalism and mass communication classes by recording class lectures and then making the audio podcasts available for students to download from an online website. Simon uses video podcasting in his film and television production classes. Simon further explained how he uses video podcasting:

> My podcasts are somewhat different, they're actually just QuickTime movies and most of them are, as I put in the questionnaire, most of them are student work because I teach film and television production, the projects that they do, I give them the opportunity to put it up as podcasts.

Simon teaches his students to make QuickTime movies as part of their student work on film and television production projects, and then he transforms his students' QuickTime movies into video podcasts that are easily accessible online via a mobile device, the Internet, or a computer. Simon uses video podcasting, so students can demonstrate their completed class projects. Simon

also uses video podcasting to explain a class lesson and give students an opportunity to watch and review the material in the video podcasts.

Jason also uses video podcasting in his English classes to record his lectures, so students can watch the video podcasts to review the material. Jason often has guest lecturers in his class, and they have a dialogue or debate, and the interaction of two or more instructors on a video podcast tends to be more interesting to students and increases student engagement. Gary added that he uses video podcasting in his teaching to record his class lectures in his instructional televised U.S. history courses, and then the podcasts are made available to students via a website. Gary also expressed that his video podcasts are available to students in online distance education classes with "24/7 capability to review previous classes for clarification/confirmation of understanding."

Jill uses audio podcasting in her teaching to record her lectures to provide a sense of instructor presence and to engage and motivate students in class. The main way she uses audio podcasting in her teaching is to deliver the main points, important concepts, and helpful tips to students for completing class assignments and to provide "more of a presence in the class without beefing up the course site with—you know—video; although, audio can be big too." Dan said he uses video podcasting in his chemistry classes to help students learn in class and in lab work. Dan also said he uses video podcasting to make his online courses livelier, to refresh himself as an instructor, to help him self-reflect on main points, and to self-reflect on his classroom performance. Furthermore, Tim uses audio podcasting in his computer science and library science classes to give students the opportunity to review, study, and receive additional clarity on class lectures and material. In the following paragraphs, a summary of the findings is discussed.

Chapter Summary

The purpose of this study was to analyze perceived benefits and constraints faced by California community college instructors when adopting podcasting in their classroom teaching. In this study, a cross-case analysis of seven participants' e-mail and telephone interviews was used to document how and why California community college instructors adopted podcasting as a teaching tool in their classroom teaching. This chapter presented the analysis of the findings of this research study, the themes derived from cross-case analysis of the data found in the e-mail and telephone interviews, as well as case descriptions of each case in this study, and answered the four research questions.

All participants expressed that they have adopted podcasting in their classroom teaching because they perceived it was easy to use an inexpensive technology that could help students to better manage their education. A majority of the participants expressed that they perceive podcasting to be a teaching tool that helps students learn or be engaged in coursework. Also, all participants expressed that they enjoyed creating podcasts to help students. The participants included those with expertise in teaching with podcasting who did not need training to learn how to use podcasting in their teaching, as well as those who had no prior technical knowledge and relied on technology support to train them on how to use podcasting in their teaching. These findings answered the first research question in this study.

Furthermore, a majority of participants revealed that the time demands of preparing transcriptions or captions for podcasts for hearing-impaired students or updating podcasting course material each semester was a constraint to their adoption of podcasting. Also, a minority of participants revealed that the time demands of planning, creating, and editing podcasts was a constraint to their adoption of podcasting. Additionally, five out of the seven participants

expressed that they perceived their college's lack of relevant technology on campus or the technology obstacles they face at their college to be a constraint to their adoption of podcasting as a teaching tool to help students. These findings answered the second research question in this study.

All of the participants expressed that the process of creating podcasts was beneficial because it helped to clarify or improve classroom instruction. Six out of the seven participants expressed that creating podcasts benefits them and students by helping better organize classes. All of the participants also expressed that creating podcasts aligned with their philosophy of teaching. Additionally, six out of the seven participants expressed that creating podcasts was easy and helped them to clarify, plan, improve, and deliver instruction to students. Furthermore, all of the participants expressed that podcasting was beneficial because students have various learning styles, and podcasting could help students with their education. These findings answered the third research question in this study.

Furthermore, all of the participants expressed that they use either audio or video podcasting in their teaching, and they either use podcasting to record their lectures or to deliver key ideas or tips for completing assignments in their classes. These findings answered the fourth research question in this study. The findings from this research study provided a deeper understanding of California community college instructors' perceived benefits and constraints for adopting podcasting in their classroom teaching. In Chapter 5, I discuss the findings, implications, and conclusions of this study, as well as areas for further study.

Chapter 5: Discussion

The purpose of this study was to analyze the perceived benefits and constraints that California community college instructors face when adopting podcasting in their classroom teaching. Four research questions were addressed in this study:

1. Why have some community college faculty in California decided to adopt podcasting in their classroom teaching?
2. What constraints did these instructors perceive to the adoption of podcasting?
3. What benefits did faculty perceive about the adoption of podcasting?
4. How did faculty use podcasting?

This chapter discusses the implications, recommendations, and conclusions of this study, as well as areas for further study.

Podcasting technology is a teaching tool that can help educate, inform, and prepare students, faculty, and higher education institutions for increasing challenges that technology changes bring to education. Technology presents major challenges for the future of higher education. For example, Clayton Christensen, the Kim B. Clark Professor of Business Administration at Harvard Business School, who is known for the theory of disruptive innovation, has predicted that less costly online educational opportunities could lead to the closure or failure of up to 50% of the universities in the United States by the year 2027 (Lederman, 2017; Sheard, 2018). However, Reed Sheard (2018), Vice-President and CIO at Westmont College, disagrees with Christensen about the massive downsizing to face universities in the next 10 years, because faculty are key to education and likely to remain an essential component of the education process:

> It is easy to understand how many see academics as the big driver of these costs. However, serving as a higher education administrator, I can state categorically that cost increases are not the result of bloated budgets or skyrocketing faculty salaries. The primary culprits are inefficient business processes and legacy technology platforms that are extremely expensive to maintain and difficult to change. Instead of talking about minimizing or even eliminating the role of faculty to find cost savings, I suggest we apply our best thought leadership to reinventing and modernizing the business of higher education. (para. 5)

Higher education institutions need to be prepared for the massive changes that technology brings in the near future.

Faculty also need to be prepared for the many changes and challenges that technology poses in higher education teaching. Also, students and their families face increasing challenges with technology, especially low-income students and families. For example, according to Leana Mayzlina, Senior Digital Inclusion Manager of The Nonprofit Technology Network (NTEN), revealed, "The web is where many of us go to access information and opportunities that improve our quality of life, yet roughly 60 million people in the United States are not yet using the internet. This needs to change" (Digital Inclusion Fellowship [DIF], 2016, p. 1). Furthermore, according to a report on digital Internet access from the Brookings Institution, "In 2015, almost one in four people (a total of 73.5 million) in the United States lived in low subscription neighborhoods, where fewer than 40 percent of households subscribed to broadband" (Tomer, Kneebone, & Shivaram, 2017, p. 22). Internet access is even a challenge in San Francisco, the center of Silicon Valley, where according to the City and County of San Francisco, cost is the major reason preventing people from Internet access: "As many as 1 in 8 people here—more than 100,000 residents—don't subscribe to home Internet" (Fung, 2018, para. 1). The lack of Internet access has a major impact on whether or not low-income students may complete online homework assignments.

Furthermore, Joseph South, Director of the Office of Educational Technology at the U.S. Department of Education (2017), wrote about the need to provide low income students with Internet access to complete digital homework assignments in *Reimagining the Role of Technology in Education: 2017 National Education Technology Plan Update*: "Many low-income students, especially in urban and rural areas, lack internet access at home to complete their digital homework assignments and to use powerful digital tools at home to create, to solve, and to communicate" (p. 1). South continued and discussed the importance of faculty to embody reflection, innovation, and collaboration values to help students adapt to changing learning models, technology, and learning environments:

> Against this backdrop, it is now more apparent than ever that the courageous efforts of educators to embrace the role of thoughtful, reflective innovators who work collaboratively with each other and alongside their students to explore new learning models, new digital learning environments, and new approaches to working, learning, and sharing is essential if we want technology to be an effective tool to transform learning. (U.S. Department of Education, 2017, p. 2)

In this chapter, I discuss the findings, implications, and conclusions of this study for three audiences: institutions, faculty, and students and families. The chapter is organized by thematic categories and includes a discussion of the findings of this study. First, a brief summary of the study is presented. Next, I present implications of the study organized by research questions and thematic categories. Third, I discuss conclusions and areas for further study. Finally, I present a conclusion at the end of this chapter.

Summary of the Study

Podcasting is an instructional technology tool being used for teaching and learning in higher education. Faculty may record lectures with audio, video, and/or PowerPoint slides to instruct students on class material. Students may access podcasts at their convenience through

various vehicles, including “personal computers, notebooks, tablets as well as mobile phones or other mobile devices for viewing. Often, additional learning material is accessible as well, for example online material or textbooks, allowing students to access learning contents in different representations” (Luttenberger et al., 2017, p. 166). Research has shown that students who use podcasts to study for tests tend to be highly successful on tests (Luttenberger et al., 2017). Given the demonstrated potential of podcasting technology for enhancing teaching and learning, this study of the perceived benefits and constraints that California community college instructors face when adopting podcasting in their classroom teaching has provided insights into instructional technology adaptation issues in higher education. In the next paragraph, an analysis of the findings is discussed.

All interview questions were grounded in the literature and prior research to provide methodical data that are reliable. The interview questions are shown in Appendix B. Rogers’ (2003) diffusion of innovations theory and, specifically, the perceived attributes of innovation and their rate of adoption is the theoretical framework used in this study to help explain how faculty develop attitudes and behavior toward podcasting as a teaching tool in higher education and to provide a context for faculty adoption of podcasting as a teaching tool in higher education. According to Casanovas (2010) and Sahin and Thompson (2006), the diffusion of innovations theory is the one most often cited as a theoretical framework to help explain individuals’ technology adoption in higher education. The justification for using Rogers’ diffusion of innovations theory as the framework for this study was to learn how faculty decide to adopt podcasting as an instructional technology in their teaching.

This study was a qualitative multiple case study of seven California community college faculty using podcasting as an instructional technology in their teaching. Email and telephone

interviews were conducted to obtain data in this study. Interviews helped me to gather data and identify themes that described faculty as individuals and why they were using podcasting in their teaching. The research questions of this study were addressed by analyzing the participants' interview responses and reflecting on the data and my notes with an interpretivist qualitative research approach through the lens of Rogers' (2003) perceived attributes of diffusion of innovations framework and their rate of adoption (PADIRA). Rogers' PADIRA definitions are shown in Table 3. In the following paragraphs, I discuss the implications of this study.

Findings

A limitation of this study is that the data in this study are 10 years old and were obtained in 2008. However, podcasting continues to greatly increase in popularity in the United States, as noted in Chapter 2 of this study. According to a 2018 study by Edison Research, an estimated 124 million people age 12 or older in the United States (44% of U.S. population) reported that they had heard a podcast compared to just 11% of the population in 2006. Furthermore, the Google Podcasts app recently became available in June of 2018, and users now have even more options to find and listen to podcasts (Barrett, 2018). Also, Erik Diehn, CEO of Midroll Media, a podcasting business that consults with popular podcasting shows, says, "The real allure of Google Podcasts comes from the broader freight of Google itself. First, the app offers AI-powered recommendations based on what you already subscribe to and your listening patterns" (as cited in Barrett, 2018, para. 8). Diehn also said that the Google Podcasts app will continue the expansion of podcasting usage by helping attract more people to the emerging technology (as cited in Barrett, 2018). In furtherance of the public's adoption of podcasting, *Time* magazine recently listed the best-rated podcasts for people to listen to (Dockterman, 2018). Also, *NPR* and several partners have recently purchased a popular podcast app, Pocket Casts, and "hope to

improve the podcast discovery experience, help creators find new audiences and improve insights for producers" (Holt, 2018, para. 1). It is within this context of the increasing popularity of podcasting that I discuss the role of instructor-created podcasts in the following paragraphs.

Educational podcasts are increasingly available online from diverse businesses and websites (Barrett, 2018; Bill and Melinda Gates Foundation, 2018; Frank, 2018; iTunes, 2017). The increasing availability and popularity of podcasts presents a promising future for instructor-created podcasts to teach and inform an increasing number of students and listeners on a wide variety of educational topics. For example, in this study, the findings show that instructors tended to adopt podcasting in their teaching when they perceived that it was inexpensive, easy-to-use inexpensive technology that could help students learn and be engaged in coursework. Given the increasing popularity of podcasts, students are likely to continue to increasingly use instructor-created podcasts to gain valuable insight into course studies. Instructors are also likely to continue to increasingly adopt podcasting in their teaching provided that colleges address and remove barriers to podcasting adoption.

For example, this study identified the following constraints to podcasting adoption: Participants revealed that the time demands of preparing transcriptions or captions for podcasts for hearing-impaired students or updating podcasting course material each semester was a constraint to their adoption of podcasting. Also, other participants revealed that the time demands of planning, creating, and editing podcasts was a constraint to their adoption of podcasting. Additionally, other participants expressed that they perceived their college's lack of relevant technology on campus or the technology obstacles they face at their college to be a constraint to their adoption of podcasting as a teaching tool to help students. Therefore, colleges

could increase faculty adoption of podcasting by removing these barriers that instructors have identified to podcasting adoption.

Furthermore, this study identified faculty perceived benefits for adopting podcasting in their teaching. All of the participants revealed that the process of creating podcasts was beneficial because it helped clarify or improve classroom instruction. Other participants expressed that creating podcasts benefits them and students by helping better organize classes. All of the participants also expressed that creating podcasts aligned with their philosophy of teaching. Additionally, participants expressed that creating podcasts was easy and helped help them clarify, plan, improve, and deliver instruction to students. Furthermore, all of the participants expressed that podcasting was beneficial because students have various learning styles, and podcasting could help students with their education. This study's findings have revealed more about the larger context of the educational practice: Higher education institutions, faculty, and students know more about the benefits and constraints of using emerging technology to enhance teaching and learning and to prepare for the rapid technological changes and advancements in teaching and learning. Given this study's instructor-identified benefits and constraints for podcasting in their teaching, this research provides a contribution to the field of educational administration and leadership because we know additional information about how and why faculty adopt podcasting in their teaching and what constraints exist related to adopting podcasting in their teaching.

Implications

The specific problem in this study was learning how faculty adapt to podcasting as an instructional technology in higher education. The implications for podcasting in higher education are wide ranging, as podcasting impacts higher education institutions, faculty, and

students. This study revealed that technology can enhance student learning and increase student engagement. For example, podcasting is a technology tool that institutions, faculty, and students could use to create collaborative learning experiences (online, blended learning, in class, and internships) that include instruction, project-based learning, library and museum settings, personal interests and lifelong learning, access for students with special needs, acquisition of technology skills to help close the digital divide, feedback, reflection, assessment, and demonstration of competency with learning objectives, which are consistent with the "five ways technology can improve and enhance learning, both in formal learning and in informal settings" (U.S. Department of Education, 2017, p. 12). In the next paragraph, I discuss the first research question in this study.

Research Question 1. The first research question was: Why have some community college faculty in California decided to adopt podcasting in their classroom teaching? Four themes emerged from the data to reveal why participants decided to adopt podcasting in their teaching: Flexibility, Personal Gratification, Student Outcomes, and Training. Flexibility refers to the wide-ranging benefits participants perceived about their experience teaching with podcasting. This theme contains attributes of relative advantage, compatibility, complexity, and trialability. All seven participants expressed that they have adopted podcasting in their classroom teaching because they perceived it was inexpensive, easy-to-use technology that could help students to better manage their education. This finding was consistent with existing research that faculty tend to adopt technology when they perceive the technology will benefit their teaching (Spotts, 1999).

Furthermore, because podcasting is an inexpensive, easy-to-learn technology, podcasting could be used to help close the digital divide among low-income students, provided these

students have access to the Internet, so they can use instructional podcasts. As noted above, students who use podcasts to study for tests tend to be highly successful on tests (Luttenberger et al., 2017). Providing Internet access for low-income students and families should be a major objective in our society because of the tremendous digital learning benefits that students may access via the Internet, according to Joseph South, Director of the Office of Educational Technology at the U.S. Department of Education (2017). In the next paragraph, I discuss the theme of Personal Gratification.

Personal Gratification refers to the faculty members' perception that podcasting is an enjoyable experience and a tool to help them improve as an instructor and help their students. This theme contains the attribute of relative advantage. All seven participants expressed that they enjoyed creating podcasts to help students. Faculty motivation for adaptation to podcasting technology is an important issue in higher education. Because faculty in this study viewed podcasting technology as an enjoyable experience and a tool to help both themselves and their students improve, they chose to adopt podcasting in their teaching. This is helpful because:

> whether instructors view the prevalence of mobile technology as a constraint or an opportunity, instructors must adapt their approaches to instruction. By doing so, instructors will be better able to a) prepare students to be professionals, b) use technology to enhance learning, c) build better relationships with and between students, and d) keep basic course research relevant. (Frisby, 2017, p. 76)

This finding is consistent with existing research that faculty tend to adopt technologies because of personal gratification (Jacobsen, 1998). In the next paragraph, I discuss the theme of Student Outcomes.

Student Outcomes refers to the faculty members' perception that podcasting is a teaching tool that helps students learn or be engaged in coursework. This theme contains attributes of relative advantage and compatibility. Four out of the seven participants expressed that they

perceive podcasting to be a teaching tool that helps students to learn or be engaged in coursework. A majority of the participants in this study agreed that a factor influencing their adoption of podcasting in their teaching was their perception that podcasting technology helped students learn and increased student engagement; this finding is consistent with existing research that whether or not technology positively impacts student learning is a concern to faculty (Brace & Roberts, 1996; Lang, 2007). In the next paragraph, I discuss the theme of Training.

Training refers to the faculty members' experience with training opportunities to learn about using podcasting and decide to adopt podcasting in their teaching to help students. This theme contains attributes of relative advantage, complexity, and observability. Four out of the seven participants perceived that training opportunities helped them to learn about podcasting and decide to adopt podcasting in their teaching to help students. Training could be changed through innovation to provide faculty with new and creative technology training opportunities. For example, in this study, some community colleges collaborated with Apple to provide faculty podcasting training on campus.

Given the growing number of technology companies in California that provide educational technologies, the California community colleges should consider increasing collaborative efforts with diverse technology companies; an example is Salesforce.org, which offers educational institutions technology tools to help with student success. For example, Salesforce.org recently "announced advancements to the Salesforce.org Education Cloud platform. Specifically, Salesforce Advisor Link 2.0, innovations with alumni and donor relationships, new Higher Education Data Architecture (HEDA) capabilities" ("Salesforce.org Extending Education," 2018, para. 1). Also, Tom Neuburger, Associate Director, CRM Center of Excellence at Smith College, revealed why they decided to adopt Salesforce.org technology:

"What we liked about Salesforce.org Education Cloud is how the platform is intuitive and easy to use" ("Salesforce.org Extending Education," 2018, para. 9). Therefore, new and innovative training collaborations should be explored at educational institutions. In the next paragraph, I discuss the second research question in this study.

Research Question 2. The second research question was: What constraints did these instructors perceive to the adoption of podcasting? Two themes emerged from the data to reveal what constraints faculty perceived to the adoption of podcasting in their teaching: Apprehension and Technological Capacity. Apprehension refers to participants' perception that they are constrained from adopting podcasting in their teaching because of time demands of learning, planning, creating, editing, and preparing transcriptions or captions for podcasts required for hearing-disabled students and because of their perceptions that podcasting requires a lot of additional work or risks. This theme contains attributes of complexity and trialability. A majority of the participants revealed that the time demands of preparing transcriptions or captions for podcasts, updating course material each semester, or planning, creating, and editing podcasts was a constraint to their adoption of podcasting. Transcriptions or captions are required by the federal government regulations, which mandate that educational institutions provide students with disabilities equal access to an education; because hearing-impaired students cannot hear the podcasts, transcriptions or captions are required when podcasts are used in a class.

Technological Capacity refers to the faculty members' perception that this is a constraint to adopting podcasting because they have too many technological obstacles to use podcasting effectively or because they lack relevant technology devices or systems on campus to effectively adopt podcasting as a teaching tool. This theme contains attributes of complexity. Five out of the seven participants expressed that they perceived their college's lack of relevant technology

on campus or that the technology obstacles they face at their college are a constraint to their adoption of podcasting as a teaching tool to help students.

Also, a majority of participants expressed apprehension that their college was placing the burden of student accessibility compliance on the faculty instead of providing faculty with a solution to accommodate students with disabilities in classes where podcasting technology was being used for instruction. The lack of faculty resources available to help instructors comply with federal government regulations concerning student accessibility was a significant constraint that either caused faculty to abandon podcasting or prevented faculty from adopting podcasting technology in their teaching. This presents educational institutions with an opportunity to learn from this study and adapt to technological innovations that present challenges to student accessibility to educational technology. Therefore, educational institutions should re-evaluate how they address challenges to technology adoption.

For example, instead of placing the burden on faculty to determine how to overcome a barrier to podcasting technology, educational institutions should consider funding technology support staff or an educational technology consulting business to find a solution to such barriers to technology adoption, because educational technology innovations are likely to continue in higher education since "at the turn of the 21st century, and following the rise of digital technology, the educational industry witnessed a new era of efficiency, effectiveness and proficiency" (Pando, 2017, para. 1). Educational institutions facing technology challenges should consider hiring an educational consulting firm, such as Deloitte, which provides higher education consulting services. For example, in 2014, Cornell University hired Deloitte to help Cornell "deliver a supported and robust technology experience to staff, students, and faculty" (Deloitte, 2017, para. 1). After assessing Cornell's technology challenges, Deloitte (2017)

determined that Cornell was using outdated technology that caused their students, faculty, and staff to have unsatisfactory technology experiences. Deloitte helped Cornell to find and adopt a better technology platform to serve the needs of their students, faculty, and staff. In the following paragraphs, I discuss the third research question.

Research Question 3. The third research question was: What benefits did faculty perceive about the adoption of podcasting? Two themes emerged from the data to reveal what benefits faculty perceived in the adoption of podcasting in their teaching: Organization and Flexibility. Organization refers to faculty members' perception that podcasting is beneficial because it is a tool to help them clarify, plan, organize, improve, and deliver instruction to students. This theme contains attributes of relative advantage, compatibility, and complexity. All of the participants expressed that the process of creating podcasts was beneficial because it helped clarify or improve classroom instruction. Flexibility refers to faculty members' perception that podcasting is beneficial because it is another method to deliver instruction to students with different learning styles. This theme contains the attribute of relative advantage.

Given the benefits faculty have identified for adopting podcasting in this study, educational institutions should consider providing ongoing faculty workshops, seminars, and professional development opportunities to learn about new and effective instructional technologies and to provide examples of best practices and how to use new and effective technologies in their teaching. There are a number of educational institutions that are recognized as leaders in adopting effective new instructional technologies that should be approached to collaborate on faculty workshops, seminars and professional development opportunities. For example, Duke University is recognized as an innovative leader in higher education for introducing one of the earliest academic uses of podcasting in fall of 2004 when they gave iPods

to more than 1600 incoming students to use in their academic learning (Belanger, 2005). Therefore, educational institutions considering adopting emerging instructional technologies should also consider collaborating with Duke University, or other innovative educational institutions and researchers, to develop faculty seminars that explore the dynamics of adopting emerging instructional technologies. This is important because the issues colleges and faculty face when deciding whether or not to adopt podcasting technology may be similar to issues colleges and faculty face when considering whether to adopt other emerging instructional technologies. In the following paragraphs, I discuss the fourth research question.

Research Question 4. The fourth research question was: How did faculty use podcasting? One theme emerged from the data to reveal how faculty use podcasting in their teaching: Organization. Organization refers to faculty members' perception that podcasting is a tool to help them clarify, plan, organize, improve, and deliver instructional podcasts and class materials to students online. This theme contains attributes of compatibility. All seven participants expressed that they use podcasting as either audio or video podcasting in their teaching, and that they either use podcasting to record their lectures or to deliver key ideas or tips for completing assignments in their classes. Given that this study revealed how faculty are using podcasting in their teaching, educational institutions and faculty should consider how to build upon these findings to more effectively include podcasting technology in their teaching. For example, a new form of blended learning in higher education is the flipped classroom, which "combines asynchronous online lectures that individual students study outside of class with F2F classroom learning activities in which students interact with peers and instructors" (J. Lee, Lim, & Kim, 2017, p. 428). In the flipped classroom, instructors incorporate audio and/or video podcasts of lectures that students may access online before and after class (Guy & Marquis,

2016; Milman, 2014). Faculty should consider incorporating podcasting in new ways into the flipped classroom. For example, faculty should consider using podcasting in the flipped classroom to deliver main ideas and exam study strategies to students, as well as student generated podcasts to demonstrate learning in subject areas as a complement to tests and essays. This innovative use of podcasting technology would benefits students by teaching them additional digital skills and would also help other students learn from their peers' podcasts that would also be accessible online.

Conclusions

This study focused on four research questions. Analysis of this study's findings revealed several conclusions. This section discusses these conclusions and their meaning. First, consistent with existing research, this study showed that faculty continue to place much weight on whether or not a proposed instructional technology benefits teaching when considering whether or not to adopt an instructional technology in their teaching (Spotts, 1999). This study also showed that faculty tend to adopt podcasting in their classroom teaching when they perceived it be an inexpensive, easy-to-use technology that could help students to better manage their education. Also, faculty tend to adopt podcasting in their teaching when they perceived that it would be an enjoyable experience. Another conclusion from this study is that helpful and informative training on how to use podcasting as an instructional tool helps to determine whether or not faculty will adopt an instructional technology in their teaching.

Areas for Further Study

The flipped classroom, artificial intelligence, mobile technologies, diverse student learning styles, student services for students with disabilities, affordable Internet access, and faculty motivation for adoption of instructional technologies are all areas for further study, so we

can continue to build on the body of knowledge in education, teaching, learning, and instructional technologies in higher education.

Chapter Summary

This chapter provided a discussion of the findings for this study, a summary of this study, the implications and conclusions of this study, areas for further study, and a chapter summary. This study has contributed to the body of knowledge of educational practice by examining and reporting how and why faculty adopt and use podcasting in their teaching as well as faculty-identified constraints to adopting podcasting in teaching. Also, this study reveals additional benefits that faculty perceive for adopting podcasting in their teaching.

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APPENDIX A: SEVEN THEMES

Apprehension	Time Demands, Lack of Institutional Support, Editing, Preparing, Planning, Transcribe, Captions, Risk, Extra Work, Time-Consuming, Constraint, Updating Information, Trial and Error
Flexibility	Easy, Simple, Inexpensive, Time-Shift, 24/7, Access, Anywhere, Repetition, Value, Clarification, Replay/Review Podcasts, Anywhere Online, Benefits Students, Student Learning Styles
Organization	Organize Lectures/Course, Deliver Class Materials, Distribute Podcasts Online, Reflection, Pacing Course, Deliver Helpful Tips
Personal Gratification	Enjoyable, Love Technology, Recognition, Leader, Innovative, Improve, Tech-Savvy, Openness, Reach Students, Interactive, New, Validated, Motivated, Incentive, Learning, Personalize.
Student Outcomes	Student Learning/Engagement, Motivate, Confirmation, Perform, Assess, Understand, Improve, Presence, Students Like Hearing Content, Success, Improvement, Content/ Asynchronous Learning
Technological Capacity	Technological Obstacles, Lack of Relevant Technology, Computing Power, Outdated Software, Institutional Priorities, Evolving Technology, File Compression, Storage, Streaming Server.
Training	Workshop, Professional, Development, Incorporate Podcasting in Teaching, Best Practices, Examples, Campus Forums, Improve, Opportunities, Innovation, Partnership, Observe, Share, Benefits.

APPENDIX B: INFORMED CONSENT/EMAIL INTERVIEW QUESTIONS

May 2, 2008

Dear Professor,

My name is Arthur Phillip Murrillo and I am a doctoral candidate at the School of Education at the University of the Pacific in Stockton, CA. I am doing a dissertation research project and I want to ask you some questions about how you use podcasting in your teaching.

Can you please answer these short questions and set a day/time when I can phone you to do a follow up interview please? Or, if you prefer, I could ask you all these questions in a telephone interview instead of e-mail.

All information is confidential. Your participation is very important to this study. Please respond to these questions by May 9 so I can ask you more questions if I don't understand.

Please e-mail your responses to Arthur Phillip Murrillo at a_murrillo@pacific.edu

Also, below is the Informed Consent followed by the questions. If you like, I could also e-mail you a copy of the Informed Consent form as an attachment.

INFORMED CONSENT

Research Project Title: Faculty Motivation for Podcasting – An Emerging Technology

You are invited to participate in a study on how California Community College Faculty are using podcasting in their teaching. The study will analyze how California Community College Faculty develop attitudes and behavior towards podcasting as an instructional tool in their teaching. You were selected as a possible participant in this study because of your experience using podcasting in your teaching at your institution. There are no risks for either responding or not responding to the email interview, however, your response to this brief interview is important to the study regardless of whether you are still using podcasting in your teaching.

An executive summary of the completed research will be provided to participating faculty and colleges to help them understand possible benefits of integrating podcasting into class teaching.

Survey responses will be kept confidential and data from this research will only be reported in the aggregate and no faculty or colleges will be identified.

However, if you would like to be identified as a leading innovator using the emerging technology of podcasting in your teaching and receive national publicity, then please inform the researcher of this desire.

Your participation is entirely voluntary. Your decision whether or not to participate will result in no penalty on you and you will suffer no loss of benefits. If you decide to participate, you are free to discontinue participation at any time without any penalty on you and you will suffer no loss of benefits

The interview questions have been approved and the study is being conducted as dissertation research through the School of Education at the University of the Pacific. If you have any questions about the research at any time, please call the researcher, Arthur Phillip Murrillo at 916.273.3283, or his faculty advisor, Dr. Norena Norton Badway at 209.946.2168 at the University of the Pacific, 3601 Pacific Avenue, Stockton, CA 95211. If you have any questions about your rights as a participant in a research project, or in the event of a research related injury, please call Dr. Carol Brodie in the Research and Graduate Studies Office, University of the Pacific, at 209. 946.7367. You will be offered a copy of this form to keep.

By responding to the email interview, you are providing consent to use the data collected in the survey for this research.

Here are the Questions

Researcher: Are you a full-time or part-time instructor?

Researcher: What is you gender?

Researcher: What is your age?

Researcher: What college courses do you teach?

Researcher: How long have you been teaching college courses?

Researcher: What motivates you to use a new technology like podcasting?

Researcher: How long have you used podcasting in your teaching?

Researcher: How often do you use podcasting in your teaching?

Researcher: In what types of courses do you use podcasting?

Researcher: What are the benefits of podcasting?

Researcher: What are the constraints to using podcasting?

Researcher: Are your podcasts accompanied by PowerPoint presentations? Why or why not?

Researcher: Tell me about your history of using technology in your college teaching?

Researcher: When did you start using podcasting in your college teaching?

Researcher: What other new technologies did you use in your college teaching in the past?

Researcher: What other new technologies are you currently using in your college teaching?

Relative Advantage

Researcher: 1) How did you decide to use podcasting instead of other technology?

Researcher: Why did you decide to use podcasting in your teaching?

Researcher: How did you learn that podcasting was available for use in your teaching?

Researcher: Did you continue to use podcasting in your teaching? Why or why not?

Researcher: 2) Tell me about the impact of podcasting on your teaching and student learning.

Researcher: In what ways did podcasting impact your teaching?

Researcher: In what ways did podcasting impact student learning?

Researcher: Do you believe that podcasting improved your teaching or student learning? Why or why not?

Researcher: 3) How can podcasting encourage other professors to use podcasting?

Researcher: 4) What are the incentives for using podcasting?

Researcher: 5) What are the incentives for using other new technologies?

Compatibility

Researcher: 6) How has podcasting impacted your teaching?

Researcher: In what ways did podcasting impact your productivity?

Researcher: In what ways is podcasting compatible with your teaching?

Researcher: In what ways do others use podcasting in their teaching in your institution?

Researcher: 7) How does podcasting align with your philosophy of learning?

Complexity

Researcher: 8) How did you learn to use podcasting?

Researcher: How easy was it to learn how to use podcasting in your teaching?

Researcher: 9) Tell me steps you went through to start using podcasting.

Researcher: Is podcasting a constraint on your other teaching responsibilities due to the amount of time required? Why or why not?

Researcher: Is podcasting a difficult technology to use? Why or why not?

Researcher: 10) How do students learn how to use podcasting?

Observability

Researcher: 11) What opportunities did you have to watch others use podcasting?

Researcher: To what extent have you had opportunities to see how others use podcasting in their teaching?

Researcher: To what extent do others use podcasting in their teaching in your institution?

Trialability

Researcher: 12) What opportunities did you have to practice using podcasting in your teaching?

Researcher: 13) What are some other uses that you have explored with podcasting?

Researcher: Have you taught your students to create podcasts in your courses? Why or why not?

Researcher: Besides recording your lectures as podcasts, how else do you use podcasting in your teaching? Why or why not?

Researcher: 14) What opportunities did you have for technology support to help you use podcasting?

Researcher: To what extent do you have technology support to assist you in trying out new uses for podcasting in your teaching?

Researcher: 15) How have you shared your podcasting experience with other faculty or with students so students will use podcasting?

Researcher: 16) What else would you like to tell me about podcasting and your teaching?

Thank you very much Professor,

Arthur Phillip Murrillo, Doctoral Student
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