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Diffusion of Innovations of Videoconference Technology: An Instrumental Case Study Concerning Undergraduate Degree-Seeking Nontraditional Learners

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Diffusion of Innovations of Videoconference Technology: An Instrumental Case Study Concerning Undergraduate Degree-Seeking Nontraditional Learners

by
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Statement of Original Work

I declare the following:

I have read the Code of Student Conduct and Academic Responsibility as described in the *Student Handbook* of Nova Southeastern University. This applied dissertation represents my original work, except where I have acknowledged the ideas, words, or material of other authors.

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Abstract

Diffusion of Innovations of Videoconference Technology: An Instrumental Case Study Concerning Undergraduate Degree-Seeking Nontraditional Learners. Bruce G. Campbell, 2015: Applied Dissertation, Nova Southeastern University, Abraham S. Fischler School of Education. ERIC Descriptors: Diffusion of Innovations, Videoconference Technology, Nontraditional Learners, Undergraduate Students, Instrumental Case Study, Personal Interviews, Focus Groups, Triangulation, Andragogy, Theory of Margin, System Blame

This applied dissertation is an instrumental case study based on diffusion of innovations theory designed to gather student opinions regarding videoconference (VC) technology use in facilitating courses to undergraduate degree-seeking nursing students. The author of diffusion of innovations theory, Rogers (2003), recommended that more qualitative studies be conducted in education. Rogers and Jain (1968) recommended these studies should be conducted from the aspect of "receivers of innovation diffusion" (p.1) to provide feedback instrumental to implementation of technological innovations in academe. Further, Rogers stated that multiple data points should be used during the process of trialing an innovation. Therefore, a current VC course was selected from the nursing curriculum of a public state college hosting one of the largest nursing programs in the southeastern United States in which to conduct the study.

A total of 32 students participated divided equally between two sites: Main campus and Regional campus. Further divided, 22 personal interviews were conducted and two focus groups; one for each campus consisting 5 students each. Additionally, included in the data corpus were 40 hours of classroom observation plus, college provided end of course (EOC) summary statements. These data were triangulated to determine whether students would accept VC technology unchanged, accept with modifications, or reject VC technology based on first time exposure to the innovation during the 16-week semester. Student innovation decisions were: 6 students accepted unchanged, 14 students accepted with modifications, and 12 students rejected the innovation. Students who rejected the innovation were exclusively from the regional campus, which was the receiving site the majority of the semester.

First and second-cycle analyses yielded 67 codes resulting in 5 categories, which further developed into 3 emerging themes: (a) Interaction with instructors, materials, and distant students are key elements affecting adoption decisions of students regarding VC technology; (b) Student adoption decisions are influenced by faculty members in their use of VC technology; and (c) Student opinions indicate that reinvention is necessary for VC technology to be fully adopted into the present nursing program. The five categories: Interaction, equipment, teaching methodology, instructor technology training, and student orientation provided ample detail from which to inform practice regarding recommendations for reinvention (modification) of VC technology during the implementation stage of Rogers' five stages of the innovation-decision model. These modifications could assist the college in gaining parity between the two nursing sites, which reported an 18.53 percentage point difference in first time pass rates on the NCLEX-RN exam reported by the Florida Department of Health (Florida Health, 2015).

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Chapter 1: Introduction

The Bureau of Labor Statistics (BLS, 2012) reported that Registered Nursing (RN) has a projected growth rate of 26% by the year 2020. Juraschek, Zhang, Ranganathan, and Lin (2012) reported, "RN demand continues to outstrip RN supply, creating an unprecedented shortage of RNs in the United States" (p. 241). The report projected that by 2030, Florida will have the second largest shortage of RNs in the United States; thus, placing a sense of urgency on nurse educators to increase enrollment, graduation, and first time pass rates for test takers of the National Council Licensure Examination for Registered Nurses (NCLEX-RN). Additionally, in 2012 the BLS estimated that there were 2,724,570 RNs in the United States; 164,800 reside in Florida; yet, there remains a nursing shortage (BLS, 2012). According to the Florida Center for Nursing (FCN, 2011), "Florida nursing schools graduated 7,890 new RNs in 2010" (p. 8), but it was insufficient to meet industry demand. The recommendation made by FCN was to expand the number of nursing programs or the number of available seats in existing nursing programs to address the shortage.

According to the American Association of Colleges of Nursing (AACN, 2011), the main reasons given for denying admission to 56.2% of those applying to nursing pre-licensure programs in 2010 was due to "an insufficient number of faculty, clinical sites, classroom space, clinical preceptors, and budget constraints" (p. 1). With a nursing program at capacity, one college in the southeastern United States accepted the challenge to extend academic opportunity to qualified but wait-listed, nursing school applicants through videoconference (VC) technology. At the time of this study, the college was using VC technology to extend academic opportunity to nursing school students to one of

its regional campuses more than 40 miles from the main campus where the school of nursing originates.

According to Bainbridge (2012), “There are more than 5,000 published studies in diffusion of innovations” (p. 124), which include studies dealing with distance education; yet, few consider instructional technology and distance education innovations from the student perspective (Rogers, 2003). Therefore, this qualitative, instrumental case study focused on nontraditional undergraduate degree-seeking students who participated in VC courses at a public, not-for-profit college in the southeastern United States. Observations, personal interviews, focus groups, and end-of-course (EOC) college generated summaries were triangulated from which to draw inferences, patterns, and emerging themes concerning whether students consider VC technology a viable medium sufficient to satisfy their academic needs in achieving expected course outcomes. This instrumental case study was bounded by a specific student population in order to provide feedback to program administrators and planners to determine whether VC technology can be considered a viable strategy to expand nontraditional undergraduate student populations.

According to Rogers (2003), large organizations first adopt an innovation then proceed through five stages necessary to complete the implementation process and make full use of the technology adopted. As of 2014, VC technology was stalled in the early stages of adoption at the college.

Rogers and Jain (1968) reported that educators need feedback prior to making decisions regarding instructional technology use in the classroom. It is anticipated that the results of this study will provide administrators the information necessary to make informed decisions to implement unchanged, implement with modification, or reject the

use of VC technology as a delivery option for providing sustainable academic programming to nontraditional undergraduate degree-seeking students located at the college studied.

Background and Significance of the Problem

Reported by FCN (2011): "Florida nursing schools graduated 7,890 new RNs in 2010" (p. 8). Considering the limited number of graduates from Florida nursing programs, it is evident that nursing schools must expand in order to keep pace with the demand for nurses. There were 7,392 qualified applicants for pre-licensure nursing programs in Florida in 2010. Adversely, these same schools rejected 4,155 qualified students due to limited available seats (FCN, 2011). Nationally, the number reported was 58,327 admission denials of qualified nursing students for the same reason. Without a paradigm shift in the way nursing programs educate students, there will be little impact on narrowing the employment gap in the nursing industry. Stated in FCN (2013a): "The Center's previous work has shown an impending shortage of RNs (an estimated 50,321 FTEs in 2025)…" (p. 1).

College background. According to the Florida Department of Education (FLDOE, 2014), "Florida's college system began in 1933" (p. 9), listing the college of this study as one of the oldest of 28 colleges in the Florida College System. These 28 colleges "were established to serve the citizens of the State of Florida by offering the first two years of a baccalaureate degree, vocational education, and adult continuing education" (p. 10). Credited to those colleges were 68 campuses and 178 academic sites; and "more than 2,000 other locations, such as churches, public schools, and community centers" (p. 10) used to extend academic opportunity for learners to gain access to higher

education. In 2005, the Division of Florida Colleges developed a strategic plan "aligned with the Department of Education's strategic imperatives and goals" (FLDOE, 2014, p. 10). From the eight sector goals listed in the initiative, goal "3. Facilitate baccalaureate expansion policies which help meet unmet community economic and educational needs"...and goal "5. Enhance learning and student services through expanded use of emerging technologies" (p. 10) specifically pertain to the present research. Goal 3 deals with expansion to help meet the needs of students who desired to attend nursing school at the college main campus, but were too far away to make a daily commute to the college; and, Goal 5 encouraged use of emerging technologies to extend academic programming to students at a distance.

Through the use of VC technology, the college was able to expand the nursing program to a regional campus location for increased opportunity to nursing students. In 2006, the Florida college system expanded its 2-year community college system into the state college system and many of the community colleges added 4-year baccalaureate degrees to their program offerings. In the 2010 academic year, the college of this study enrolled more than 400 students in baccalaureate degree programs (FLDOE, 2014). In 2012, this 4-year institution was ranked in the top 20 colleges in the nation granting more than 4,000 associates degrees as a continued mainstay (Community College Week [CCW], 2013).

Nurse education. The regional campuses of the college originated as satellite locations then grew to full campuses serving communities surrounding each location. The school of nursing remained housed in its original location at the main campus, extending the nursing program to a cohort at one of the regional campuses. In 2013, the college

celebrated a regional campus graduating class NCLEX-RN exam pass rate of 87.5% when the national average for first time pass rate was 81.43% (Florida Health, 2015). The number of first time NCLEX-RN exam takers from the college for 2013 both campuses combined total was 177; reported by the Florida Legislature Office of Program Policy Analysis and Government Accountability (OPPAGA, 2014).

Nontraditional learners. The National Center for Education Statistics **(**NCES, 2013) provide descriptive statistics that differentiate learners by age: College students 25 years and above are referred to as adult learners or nontraditional students. It is important to differentiate between traditional and nontraditional learners for the purpose of this study due to the consideration of differences in learning styles and motivations for those pursuing academic degrees (Knowles, Holton, & Swanson, 2005; Main, 1979). The FLDOE (2013) in its 2013 annual report stated that the average age of state college students was 26 years of age, which classifies students as nontraditional learners. Additionally, the FCN (2013a) annual report revealed, "51% of ADN [associate degree nursing] students" (p. 3) were aged 30 or younger. A demographic report from the college reflected pre-licensure ASN students had an average age of 27.8 (Panorama, 2014a). Essentially, the average age of the nursing student fits the definition of adult learner or nontraditional learner. Recommendations in the FCN (2014) report included "New methods of education, clinical and didactic, should be developed to accommodate the learning style of diverse students...." (p. 13).

Distance Learning

Lewis, Alexander, and Farris (1997) authored an empirical study of distance education for NCES, which described modalities in distance education to include audio,

video, and computer technology to deliver education to students in distant locations. Through use of technology, program administrators were able to bridge the transactional distance between student and professor (Simonson, Smaldino, Albright, & Zvacek, 2012). Over time, many distance learning institutions transitioned as more user-friendly technologies came available (Zhao, Waldman, Perreault, & Truell, 2009).

Innovations in technology. Distance learning modalities at the college included correspondence type courses initially referred to as "Course-in-a-box" (B. Kelley, personal communication, June 25, 2014). Later, the college used local television broadcasting to facilitate courses at a distance. The college phased that out with the advent of Internet technology, which occurred about the same time that VC technology was adopted by the college. The use of VC technology for distance learning began as a collaborative effort between the college, the county school board, and a major telephone service provider who had interest in installing a countywide fiber optic network. The installation extended high-speed Internet capability to county residents, as well as generated the opportunity to utilize VC technology for academic programming at the college. An archived news release reported, "The phone company has added 4,500 miles in the first quarter of 1996" (Lorek, 1996, p. 1). By the end of 1996, the phone company had installed "more than 11,000 miles of fiber-optic cable" (Lorek, 1996, p. 1). Collaborative partnerships between industry and higher education were discussed as one trend to affect education in the future (Campbell, 2012a; Howell, Williams, & Lindsay, 2003).

In the late 1990s, the college administration adopted VC technology for use in extending academic programming from the main campus to one of the regional campuses

for the nursing degree program. Additionally, the college used VC technology to support dual enrollment opportunities to students in several public high schools (B. Kelley, personal communication, June 25, 2014). Although no longer used in the high schools, VC technology remains in use by the school of nursing to connect the main campus with a regional campus much like it was when originally adopted for use in the nursing program. This method of course delivery has neither advanced to other academic centers nor declined in its traditional use at the college. Panorama (2014b) reported 233 nursing school graduates, up from 174 in 2013.

Statement of the Problem

Videoconferencing is a viable delivery option for facilitating distance learning courses in colleges and universities in the United States (Richardson, Fox, & Lehman, 2012). Although the college utilizes VC technology to facilitate courses in the school of nursing, VC technology has not been implemented by other academic centers of the college. According to Rogers (2003) an innovation is not considered fully adopted until the last few group members are persuaded to adopt the innovation. At the college, the technology has been in use exclusively in the nursing program since 2006. Other academic centers have not determined whether VC technology is a viable strategy for extending academic opportunity to other degree-seeking students located at the regional campuses of the college.

Diffusion of innovations. Rogers (2003) diffusion of innovations theory delineates two adopter groups: individuals and organizations. When referring to individual consumer behavior concerning a particular technological innovation there are five adopter categories: innovator, early adopters, early majority, late majority, and

laggards. When considering adoption of a technological innovation in an organization, the innovation must be adopted initially; then, different divisions or individuals progress through the implementation stages to utilize the technology previously adopted by the organization. According to Rogers (2003) "An innovation spreads among the companies in an industry in a diffusion process that is similar to the way that an innovation diffuses among the individuals in a community or some other system" (p. 407). Adopter categories still apply to large organizations that have multiple separate divisions, as is the situation with the college.

The college has multiple academic centers that operate with autonomy. Therefore, adopter categories can be useful in gaining understanding of adoption behavior during the diffusion process of a specific technological innovation within the organization. There is, however, an important distinction between individual adopters and organizations. Individuals adopt at a later decision stage; whereas in organizations, the adoption of the innovation occurs in the initial phase, followed by implementation of the innovation as the second phase in the diffusion of innovations in organizations (Rogers, 2003).

Adopter categories. Five categories describe the adopters in diffusion of innovations theory: innovators, early adopters, early majority, late majority, and laggards. The adopter classifications are based on level of innovativeness and rate of adoption. Innovators are risk-takers and are able to "cope with higher levels of uncertainty" (Rogers, 2003, p. 22) and are the first group in a social system to adopt an innovation. Early adopters adopt based on the influence of innovators and the early evaluation of the innovation. The majority of adopters are in the early and late majority categories, leaving laggards as the final group that will not adopt an innovation until "they feel that most

uncertainty about the innovation's performance has been removed" (Rogers, 2003, p. 294).

According to Rogers (2003) in order for an innovation to be fully adopted, all five adopter categories must implement the innovation. In the bounded system of the college studied, VC technology has stalled in the early adoption stage. Four of the five categories have not yet considered the innovation of VC technology for use in distance education applications.

Issue of implementation. Zaltman, Duncan, and Holbek (1973) reported that adoption of innovations in organizations was more dependent on implementation rather than actual adoption behavior of individual consumers. Once an organization decides to purchase or adopt an innovation, implementation becomes the issue of primary concern. Consumer behavior in the adoption process considers the role of an opinion leader to be the innovator to influence the adoption process. In large organizations, the individual that influences and initiates the adoption process is referred to as an *innovation champion*. In the 1980s according to Rogers (2003) "An explosion occurred in the number of studies on innovation in organizations" (p. 417). This was due to the increased introduction of new technologies available to organizations and researchers who "became fascinated with studying the innovation process" (p. 418). One feature that Rogers suggested unique to organizations was that successful adoption of an innovation was predicated upon the ability of an innovation champion "to initiate the innovation process and to guide the new idea through to approval and implementation" (p. 417). Although, VC technology early adoption and utilization was a community collaborative effort; once installed, no real defined champion was attributed with continuing to guide the innovation through to full

implementation beyond its originally intended purpose.

Adoption and implementation. Regarding adoption and implementation of VC technology, the school of nursing at the college is the innovator, the first department to make use of the technology for expanding academic programming at the college.

Resistance to adopt. Nationally, there is a commonly held belief among faculty and administrative members that distance education and face-to-face education do not yield the same academic outcome; as reported in annual surveys concerning distance education conducted for the Sloan Consortium (Allen & Seaman, 2013).

System-blame. Rogers (2003) stated that "A frequent error is to overstress individual-blame in defining a social problem, and to underestimate system-blame. *System-blame* is the tendency to hold a system responsible for the problems of individual members of the system" (p. 119). To overcome system blame, Rogers (2003) recommended studying innovations from the point of view of receivers of the innovation to ensure that studies are unbiased. Studying responses of students who participated in courses through VC technology avoids pro-innovation bias.

Phenomenon of Interest

In the late 1990s, VC technology was implemented for use in the delivery of academic programming to nursing students at a regional campus of the college; thus enlarging the nursing program with additional seats. Course programming included instruction predominantly through VC technology to the students located on the regional campus. However, no qualitative studies were conducted concerning student opinions of VC technology. Therefore the present qualitative case study sought student opinions of VC technology when used for course delivery of academic programs such as nursing.

Background and Justification

Adoption in education. According to Rogers (2003) there are three types of innovation decisions: optional, collective, and authority. Concerning these three: collective and authority decisions are more common in organizations "such as factories, schools, or government organizations, in comparison with other fields such as agriculture and consumer behavior, where most innovation-decisions by farmers and consumers are optional" (Rogers, 2003, p. 29).

Mandates negatively correlate. Though other industries show that mandates from organization leaders facilitate the rapid adoption process of an innovation within an organization, Fullan (1993) reported that in academe, mandates concerning adoption of an innovation prove counter to Rogers (2003) assumption. Additionally, Warford (2005) stated "Authoritarianism in the decision-making structure is negatively correlated with educational diffusion" (p. 8). Additionally, Hall, George, and Rutherford (1977) discussed a later phase in innovation. This comes after trialing an innovation and the consequences are determined and evaluated. This is a point where teachers or facilitators are able to evaluate an innovation's effect on the students. To date, administrators, teachers, and facilitators have been unable to evaluate VC technology from the student point of view because the students who participated were never studied.

Five stages in the innovation process in organizations. Rogers (2003) defined two main activities through which organizations progress in the innovation process: *initiation* and *implementation*. The initiation process involves a subset of *agenda setting* and *matching*; whereas, the implementation process involves three stages—*redefining/restructuring, clarifying,* and *routinizing*.

Initiation. Rogers described the five stages as an ongoing process by which organizations implement innovations in technology. Rogers (2003) also stated that "Once an organization has made a decision to adopt; implementation does not always follow directly" (p. 402). Concerning agenda setting: Nursing program administrators may have discovered what Rogers (2003) described as "general organizational problems that may create a perceived need for the innovation" (p. 422). In this case, the organizational problem was how to increase enrollment of nursing students when the traditional approach could not keep pace with the applicant pool of qualified nursing students presently waitlisted. Regarding matching: Rogers (2003) stated: "This second stage in the innovation process, conceptual matching of the problem with the innovation occurs in order to establish how well they fit" (p. 423). Previously, nursing students participated in studies on the main campus of the college in a traditional face-to-face setting. However, there were qualified nursing applicants who were place bound near a regional campus. They did not wish to commute to the main campus of the college on a daily basis. Alternatives were needed to extend nurse education to students at a distance.

At this point in the present study, the remaining three steps in the implementation process are under the category of *implementation* in Rogers' model. The decision to adopt VC technology has stalled. According to Rogers (2003) the results from the present study should provide decision makers information sufficient to move forward in the decision process to implement unchanged, implement with modifications, or reject VC technology as a viable solution for undergraduate student growth.

Therefore, this study was designed to provide qualitative information concerning student opinions of VC courses, which will assist administrators of academic programs in

gaining knowledge sufficient to make informed decisions concerning implementation of VC technology. Additionally, providing study results in this manner will also assist academic leaders in avoiding the resistance and possible refusal to implement brought on by a mandate, which has proven to have adverse effect concerning adoption of technological innovations in education (Warford, 2005).

Deficiencies in the Evidence

Limited qualitative evidence. No interviews were conducted concerning nontraditional undergraduate student opinions of VC technology, which is poised to become fully accepted or "institutionalized within the adopting system" (Warford, 2005, p. 10). Rogers and Jain (1968) observed: "diffusion research has largely been a tool on the side of sources, not receivers of innovation diffusion" (p. 1). The present case study focused on students as receivers of the innovation of VC technology. Through observations, qualitative interviews, focus groups, and documents; this qualitative study may contribute to the current body of research to provide a more comprehensive understanding of how students perceive quality of their learning experience when facilitated through VC technology.

Audience

This study was intended to provide information to college administrators responsible for the growth of nursing student enrollment at distance campuses; deans and faculty members facilitating undergraduate studies; and educators within the nursing industry whose focus is to find a way to expand nursing education opportunities to qualified nursing school candidates presently wait-listed due to limited seating in schools of nursing statewide and nationally. Additionally, this study contributes to the growing

body of knowledge concerning diffusion of innovations in education; specifically in the area of "receivers of innovation diffusion" (Rogers & Jain, 1968, p.1).

Definition of Terms

Adoption. Rogers (2003) defined adoption as "A decision to make full use of an innovation as the best course of action available" (p. 473).

Andragogy. Schlosser and Simonson (2010) described Malcolm Knowles' theory of adult learning:

> Andragogy is a set of assumptions based upon how adults learn best, formalized in 1970 by Malcolm Knowles who based the theory upon four premises: 1) adults are self-directed in their learning; 2) adults have much more personal experience they bring to their learning; 3) adults are focused on the developmental tasks of their social roles; and 4) adults focus toward learning shifts from subject-centeredness to one of problem-centeredness. (p. 89)

Code. Saldańa (2013) stated: "In qualitative data analysis, a code is a researcher-generated construct that symbolizes and thus attributes interpreted meaning to each individual datum for later purposes of pattern detection, categorization, theory building, and other analytic processes" (p. 4).

Diffusion. Rogers (2003) defined diffusion as "The process in which an innovation is communicated through certain channels over time among the members of a social system" (p. 474).

Distance education. The most widely recognized definition in the field of distance education is "institution-based, formal education where the learning group is separated, and where interactive telecommunications systems are used to connect learners, resources, and instructors" (Schlosser & Simonson, 2010, p. 1, as cited in Simonson et al., 2012, p. 7).

Distance learning. Listed in the *2009 Encyclopedia Britannica Book of the Year*

is the accepted definition of distance learning:

> Four characteristics distinguished distance education. First, distance education was by definition carried out through institutions; it was not self-study or a nonacademic learning environment. The institutions might or might not offer traditional classroom-based instruction as well, but they were eligible for accreditation by the same agencies as those employing traditional methods. Second, geographic separation was inherent in distance learning, and time might also separate students and teachers. Accessibility and convenience were important advantages of this mode of education. Well-designed programs could also bridge intellectual, cultural, and social differences between students. Third, interactive telecommunications connected the learning group with each other and with the teacher. Most often, electronic communications, such as email, were used, but traditional forms of communication, such as the postal system, might also play a role. Whatever the medium, interaction was essential to distance education, as it was to any education. The connections of learners, teachers, and instructional resources became less dependent on physical proximity as communications systems became more sophisticated and widely available; consequently, the Internet, cell phones, and e-mail had contributed to the rapid growth in distance education. Finally, distance education, like any education, established a learning group, sometimes called a learning community, which was composed of students, a teacher, and instructional resources—i.e., the books, sound, video, and graphic displays that allowed the student to access the content of instruction. (Simonson, 2009, p. 231)

Innovation. An innovation is an "idea, practice, or object that is perceived as new by an individual or other unit of adoption" (Rogers, 2003, p. 475).

Nontraditional student. The NCES (2013) provided descriptive statistics, which differentiate learners by age: College students who are 25 years old and above are referred to as adult learners or nontraditional students.

Pro-innovation bias. Described in Rogers (2003), pro-innovation bias is "the implication in diffusion research that an innovation should be diffused and adopted by all members of a social system, that it should be diffused more rapidly, and that the innovation should be neither reinvented nor rejected" (p. 476).

System-blame. Defined in Rogers (2003), system-blame is "the tendency to hold a system responsible for the problems of individual members of the system" (p. 119).

Video conference. According to Schlosser and Simonson (2010), a video conference comprises multi-users at various locations connected by "two-way motion media telecommunications so that most participants can see each other. Each participating site must have both transmission and receiving capacity for audio and video" (p. 237).

Videoconferencing. Schlosser and Simonson (2010) defined videoconferencing:

> The use of analog or digital video technology to connect multiple parties simultaneously in a conference where participants can see and hear each other. Point-to-point videoconferencing refers to a two-party conference. Multi-point videoconferencing refers to a multiple (more than two) party conference. (2) Similar in concept to audio conferencing but employs both voice and motion-video communications. Participants are able to see participants at other locations if allowed by the chairperson or instructor. Uses digital transmission systems such as ISDN, switched 56 services, or dedicated channels such as DS-3 or fiber optics. (3) The practice of connecting people at two or more locations through analog or digital video transmission. Videoconferencing stations can be connected in point-to-point or multipoint configurations. (4) An interactive one- or two-way video and audio conference among three or more designated sites. Conferences can be conducted via telephone lines (compressed) or satellite. (5) Conduction of a conference between two or more computers at different locations by the use of networks to transmit and receive audio and video data. (6) A meeting, instructional session, or conversation between people at different locations relying on video technology as the primary communication link. (p. 238)

Purpose of the Study

The purpose of this study was to examine the phenomenon of nontraditional undergraduate student opinions of courses delivered through VC technology, with diffusion of innovations theory at the center and focused on VC technology as administered to undergraduate degree-seeking nontraditional learners.

Chapter Summary

Discussed in this chapter was the history of the Florida college system and the college that incorporates the use of VC technology to extend academic programming to

nursing students at a regional campus. The academic center of the college studied was clearly established as an innovator and pioneer in instructional technology to extend academic opportunity to distance learners through the extensive use of technological innovations in instructional technology. This resulted in expansion of the student population and academic opportunity at the regional campus. The history of VC technology at the college was also discussed. Additionally discussed was Rogers' (2003) diffusion of innovations theory to bring clarity to the process of adoption and implementation through which individual academic centers within institutions progress in arriving at decisions to implement or reject innovations in technology.

According to Bainbridge (2012), more than 5,000 studies have been conducted concerning diffusion of innovations in technology including studies dealing with distance education. According to Rogers (2003), few studies consider instructional technology and distance education innovations from the student perspective. Pro-innovation bias is a concern when studies are conducted from the perspective of stakeholders; therefore, this study was conducted from the perspective of students, the receivers of VC technology. The purpose of this study was to examine the phenomenon of nontraditional undergraduate student opinions of VC technology when used to close the transactional distance between instructors and students in distance education.

Chapter 2: Literature Review

This literature review covers key elements, which are the focus of the instrumental case study in the diffusion of innovations of VC technology concerning undergraduate degree-seeking nontraditional learners. Points covered include a discussion of the theoretical perspective within which the study was grounded; a historical context of the study; summary regarding the phenomenon and its importance; identification of gaps and limitations in the literature; a discussion of how the research contributes to the body of knowledge; and finally, articulation of the unique contribution of the present dissertation study.

Theoretical Perspective: Diffusion of Innovations

Diffusion of innovations theory gained its recognition when Rogers (2003) formalized the theory initiated by Gabriel Tarde who began to study the adoption of innovations in the early1900s. Tarde referred to them simply as imitation; yet his research attempted to discover why consumers adopted certain innovations, while others did not. In 1962, Rogers formalized the terminology in the first edition of his publication, *Diffusion of Innovations*. From that point forward, the verbiage and definitions in the process of adoption of innovations operationalized to what is in the literature today.

Four Main Elements Described

Innovation. In diffusion of innovations theory, an innovation is described as a technological idea, practice, or object that is considered "new by an individual or unit of adoption" (Rogers, 2003, p. 12). It may actually be new or only new to the individual. An example of this might be a VC course to a student with no prior experience in distance learning through VC technology. In the present case study, students who participated in VC courses at other colleges were few in number. However, all students in the present

study were second semester nursing students and were experiencing VC technology in the program for the first time. The first semester had not included VC technology use for this cohort.

Communication channels. The exchange of information between two or more individuals or groups with the message concerning a new innovation is the basis of the communication channel in diffusion of innovations theory. The receiver of the information about the innovation has no prior knowledge of the innovation. This is in reference to any new innovation in technology passed through the communication channel to the receiving individual or group (Rogers, 2003).

Time. Time is one of the variables in the process of adoption. This can involve "the relative speed with which an innovation is adopted by members of a social system" (Rogers, 2003, p. 37).

Social system. The social system is "a set of interrelated units that are engaged in joint problem solving to accomplish a common goal. The members or units of a social system may be individuals, informal groups, organizations, and/or subsystems" (Rogers, 2003, p. 23). In the college studied, the system analyzed included subsystems consisting of nursing students from the main campus as well as from the regional campus.

Consumer Adoption: Five Stages in the Innovation-Decision Process

According to Rogers (2003), consumers progress through five successive stages in the innovation-decision process. This process applies to individuals as well as to decision-making units. Rogers stated: "This process consists of a series of choices and actions over time through which an individual or a system evaluates a new idea and decides whether or not to incorporate the innovation into ongoing practice" (p. 169).

Although, there are five progressive stages in the decision process, Rogers (2003) further stated: “The innovation-decision process can just as logically lead to a rejection decision as to adoption. In fact, each stage in the innovation-decision process is a potential rejection point” (p. 177).

Knowledge stage. This is the initial point of introduction when an individual gains awareness of an innovation and how it functions. How-to knowledge is vital to the success of an innovation. Rogers (2003) stated that if “an adequate level of how-to knowledge is not obtained prior to the trial and adoption of an innovation, rejection and discontinuance are likely to result” (p. 173). Rogers continued by stating that “few diffusion investigations deal with how-to knowledge, although it must be a fundamental variable in the innovation-decision process” (p. 173).

Persuasion stage. Rogers (2003) pointed out that the main thinking in this stage is affective (emotions). Persuasion here “is equivalent to attitude formation and change on the part of an individual, but not necessarily in the direction intended by some particular source” (p. 175). The objective in this stage is uncertainty reduction concerning a particular innovation. However, Rogers stated that mass media information is too general to answer specific concerns so the individual tends to seek reinforcement from peers or near-peers to confirm his or her initial beliefs concerning the innovation.

Decision stage. In the decision stage, an individual or unit interacts with the innovation in such a way that leads to a choice to accept or reject the innovation. One way to accelerate the decision stage is the ability to trial the innovation prior to making any decision to accept or reject. According to Rogers (2003), there are two types of rejection: active rejection where a decision is made to reject the innovation and passive

rejection "(also called nonadoption), which consists of never really considering the use of the innovation" (p. 178).

Implementation stage. The fourth stage in the adoption process is the implementation stage. This occurs when an innovation is put into service. According to Rogers (2003) all stages prior to the implementation stage are "a strictly mental exercise of thinking and deciding. But implementation involves overt behavior change as the new idea is actually put into practice" (p. 179). Though some concerns remain, enough uncertainty reduction has occurred that the individual has decided to adopt the innovation. Rogers stated "the completion of the implementation stage is marked by a point when the new innovation becomes institutionalized as a regular part of the adopter's ongoing operations" (p. 180). Another thing apt to occur in the implementation stage is referred to as *reinvention*. Reinvention occurs when an innovation is in some way "changed or modified by the user in the process of its adoption and implementation" (p. 35). According to Rogers (2003), what was originally thought to be an anomaly by researchers, reinvention was initially dismissed in adoption research. Once researchers began to study innovations at the implementation stage, it was discovered that "a great deal of reinvention was found in most diffusion programs" (p. 183).

Reinvention may serve as a catalyst in uncertainty reduction and discovery of greater benefit in the adoption of an innovation. According to Rice and Rogers (1980), reinvention is a welcomed quality of an innovation. Rogers (2003) stated that "as a result of reinvention, an innovation may be more appropriate in matching an adopter's preexisting problems and more responsive to new problems that arise during the innovation-decision process" (p. 185). Results from a national survey of innovation in

public schools revealed that when an educational innovation was reinvented by a school, its adoption was more likely to be continued (Berman & Pauly, 1975).

Confirmation stage. In this stage, the adopter seeks reinforcement for the decision previously made to adopt the innovation. According to Rogers (2003), the adopter also seeks to avoid information that would cause them to doubt or even reverse their decision to adopt. In diffusion of innovations, this state of disequilibrium is termed *dissonance.* Rogers reported that dissonance can occur at any stage in the adoption process; however, it can be particularly disruptive during the confirmation stage after the innovation has already been implemented. If this dissonance continues, it is likely to result in discontinuance**.** According to Rogers (2003), discontinuance takes one of two forms: Replacement or disenchantment. Replacement occurs when an innovation does not perform to expectations. Disenchantment discontinuance is "a decision to reject an idea as a result of dissatisfaction with its performance," which "may come about because the innovation is inappropriate for the individual and does not result in a perceived relative advantage over alternatives" (p. 190). Rogers stated, "Discontinuance of an innovation is one indication that the new idea may not have been fully routinized into the ongoing operations of the adopter at the implementation stage of the innovation-decision process" (p. 191).

Organization Adoption: Two Phases in the Implementation Process

When organizations decide to adopt a technological innovation, it is typically accomplished through the influence and activity of an innovation champion (Rogers, 2003). Rogers stated "The champion's role is to initiate the innovation process and to guide the new idea through to approval and implementation" (p. 417). Organizations

behave differently than individuals in the adoption process. In an organization, once adopted, the issue is implementation. According to Rogers (2003), an organization progresses through five sequential stages in the process of implementation. These stages are: agenda setting, matching, redefining/restructuring, clarifying, and routinizing. These five stages comprise two phases. The first phase is the initiation phase; and the second phase is the implementation phase.

Initiation Phase

During the initiation phase, the organization progresses through the first two stages: *Agenda setting* and *matching*. It is important to note that Rogers (2003) stated that an organization must pass through each stage in progressive order.

Agenda setting. According to Rogers (2003), "Agenda-setting initiates the sequence of the innovation process, for it is here that the initial motivation is generated to impel later steps in the innovation process" (p. 422).

Matching. Rogers (2003) stated that "matching is defined as the stage in the innovation process at which a problem from the organization's agenda is fit with an innovation, and this match is planned and designed" (p. 423). A cost-effective and potential solution to narrowing the transactional distance between teacher and students of the school of nursing provided motivation for the adoption and implementation of VC technology. This gave way to matching the idea of using VC technology to extend academic programming to students in a geographic region where nursing degree programming was limited.

Implementation Phase

The second and final phase in the innovation process of an organization is the

implementation phase (Rogers, 2003). It is this phase in which an organization passes through the three remaining stages: *redefining/restructuring*, *clarifying*, and *routinizing*.

Redefining/restructuring. Rogers (2003) stated that "redefining/restructuring occurs when the innovation is reinvented so as to accommodate the organization's needs and structure more closely, and when the organization's structure is modified to fit with the innovation" (p. 424). In the college studied, it was necessary to expand the instructional media department to manage the increased use of VC technology. This also meant that new training needed to be designed and implemented for faculty members to become familiar with the new technology for use in the nursing program. Tyre and Orlikowski (1994) determined that modifications to an innovation to fit an organization must occur very early in the implementation phase. It is unlikely that changes will be made in later stages. The innovation is routinized and quickly becomes part of the organization's structure (Rogers, 2003).

Clarifying. According to Rogers (2003): "Clarifying occurs as the innovation is put into more widespread use in an organization, so that the meaning of the new idea gradually becomes clearer to the organization's members" (p. 427). With each increasing opportunity for expansion, the value of VC technology becomes clearer to some academic centers, while others remain uncertain of its usefulness in extending academic programming to students at a distance. This is the point at which individual academic centers respond to the innovation much as individuals do when faced with adopting an innovation in technology.

Routinizing. The final stage in the implementation phase is routinizing. "Routinizing occurs when an innovation has become incorporated into the regular

activity of the organization and has lost its separate identity. At this point, the innovation process is completed" (Rogers, 2003, p. 428). Routinizing is closely related to sustainability of an innovation within an organization. Sustainability or survival of an innovation is significantly increased by the amount of participation involved in the process of adoption and implementation. At this point in the process, adoption of an innovation within an organization is much like that of the adoption of an innovation among consumers. The following five adopter categories can be used to describe both entities (Rogers, 2003).

Five Adopter Categories

There are five categories of adopters. According to Rogers (2003) they are "*ideal types,* concepts based on observations of reality that are designed to make comparisons possible" (p. 282). Rogers stated that these "ideal types are based on abstractions from empirical investigation" (p. 282).

Innovators. Rogers (2003) gave a one word descriptor to each of the five categories. He described innovators as *venturesome* stating that "venturesomeness is almost an obsession with innovators" (p. 282). Rogers stated that innovators are the first "2.5 percent of the individuals in a system to adopt an innovation" (p. 280). According to Rogers (2003), the innovator may not have the respect of the organization members. However, "The innovator plays an important role in the diffusion process: that of launching the new idea in the system by importing the innovation from outside of the system's boundaries" (p. 283).

Early adopters. The one word descriptor given to early adopters by Rogers (2003) was *respect.* According to Rogers, "the next 13.5 percent to adopt the new idea

are ... labeled *early adopters*" (p. 280). "Early adopters are a more integrated part of the local social system than are innovators" (p. 283). Additionally, this category "has the highest degree of opinion leadership in most systems. Potential adopters look to early adopters for advice and information about an innovation …. Early adopters help trigger the critical mass when they adopt an innovation" (p. 283). Early adopters are highly sought after by change agents knowing that if they adopt the innovation many will follow. "The early adopter is respected by his or her peers, and is the embodiment of successful, discreet use of new ideas" (p. 283).

Early majority. Described as *deliberate*, Rogers (2003) stated that "the early majority are one of the most numerous adopter categories, making up one third of all members of a system" (p. 284). The early majority is slightly ahead of the average adopter and "provide interconnectedness in the system's interpersonal networks" (p. 284). Rogers stated that "the early majority's unique location between the very early and the relatively late to adopt makes them an important link in the diffusion process. They provide interconnectedness in the system's interpersonal networks" (pp. 283–284).

Late majority. According to Rogers (2003) the late majority are described as *skeptical* and "like the early majority, the late majority make up one third of the members of a system" (p. 284). Additionally, Rogers (2003) stated: "The pressure of peers is necessary to motivate adoption. Their relatively scarce resources mean that most of the uncertainty about a new idea must be removed before the late majority feel that it is safe to adopt" (p. 284).

Laggards. Rogers (2003) described laggards as *traditional* and "the last in a social system to adopt an innovation" (p. 284). According to Rogers, laggards "possess

almost no opinion leadership" (p. 284). They are also considered "near isolates in the social networks of their systems" (p. 284). Laggards comprise the remaining "16%" of a social system for complete adoption of an innovation (p. 281).

Historical Context of the Study

Distance education. The most widely recognized definition in the field of distance education is "institution-based, formal education where the learning group is separated, and where interactive telecommunications systems are used to connect learners, resources, and instructors" (Schlosser & Simonson, 2010, p. 1, as cited in Simonson et al., 2012, p. 7). This definition encompasses the group of learners researched in the present study. The specific population under review were nontraditional students defined as college students who are 25 years old and above **(**NCES, 2013). Distance education, according to Radford (2011), is appealing to nontraditional learners predominantly because it accommodates a more rigorous and time-intensive lifestyle than younger students with less family or work demands on their time. Radford reported that "Older undergraduates and those with a dependent, a spouse, or full-time employment participated in both distance education classes and degree programs relatively more often than their counterparts" (p. 3).

Studies have shown that distance education is more attractive to learners in a restrictive environment such as full-time workers, deployed military personnel, adults with children or family responsibilities, individuals confined to a hospital bed, or homebound (Brooks & Grover, 2004; Burke, Chaney, & Kirsten, 2010; Carter, 2001; Latanich, Nonis, & Hudson, 2001; Lőgdlund, 2010; Parsad & Lewis, 2008; Radford, 2011; Renes & Strange, 2011). Although traditional and nontraditional learners may have

adopted distance education as a viable learning option, conflicted views remain between administration and faculty in higher education institutions concerning distance education learning outcomes when incorporating distance learning technology facilitate courses (Allen & Seaman, 2013; Allen, Seaman, Lederman, & Jaschik, 2012; Renes & Strange, 2011) .

Innovations in technology. An innovation in technology that made distance education possible on a global scale was the Internet. Although a few innovative colleges and universities were able to develop their own proprietary computer-based programming for distance learning beginning in the 1970s; the majority made the decision to adopt online and distance learning technologies decades later when technological advances made distance learning options more robust while less costly to implement (Simonson et al., 2012; Zhao et al., 2009).

The Innovation: VC Technology

From its beginning, VC technology by design was intended to close the communication gap, or transactional distance, between the sender and receiver in the communication channel. Introduced at the 1964 World's Fair in New York, VC technology was intended to replace the standard telephone. In 1970, AT&T unveiled a commercialized version with its introduction of the *Picturephone*, a closed circuit device that allowed communication between two points providing both audio and visual telemetry for the users. However, it was considered cost prohibitive for general consumer applications (Nefsis, 2013).

In the late '70s the innovation began to show possibilities with the first transatlantic VC call by electronics manufacturer Ericssen. Other phone companies began

experimenting with the technology including Nippon with their first VC call between Tokyo and Osaka, Japan. Attributed with the first large scale production and use of VC technology was IBM Japan with the establishment of the technology for internal use in their monthly corporate meeting calls to IBM in the United States in 1982. The technology was too expensive in its early stages for mass consumer adoption, however; and was estimated to take considerable time before it was made affordable (Nefsis, 2013). As discussed, there are multiple applications for VC technology; however, for the purpose of this study, VC technology was considered only in its application in higher education and its use in providing educational opportunity to students at a distance.

Accessibility through technology. One of the major points in favor of distance education is accessibility to academic courses. Technology is a vehicle that makes it possible to close the transactional distance between learner and instructor (Clark, 2012; Magiera, 1994; Martin, 2005; Renes & Strange, 2011). Although adult education places emphasis on access to information, it is important to remember that one of the best sources of information for a student is the instructor (Beck, 2010; Clark, 2012; Renes & Strange, 2011). Although technology is useful in closing the distance between learner and instructor, Clark (2012) termed technology as "mere vehicles" (p. 2); whereas other authors referred to technology as tools for connecting learners with instructors and information (Campbell & Swift, 2006; Harnar, Brown, & Mayall, 2000; Karal, Çebí, & Turgut, 2011; Magiera, 1994; Renes & Strange, 2011).

Traditional instructors. Access to instructors and materials through technology for distance learners is of value to college administrators, to faculty members, and to students. However, there is controversy surrounding the benefit that each stakeholder

attributes to distance learning technology. Regarding the differences in opinion between administrators and faculty members, there is a divide. According to Allen and Seaman (2013), 77% of administrators surveyed rated "learning outcomes in online education as the same or superior to those in face-to-face" (p. 5); whereas, surveys conducted by Allen et al. (2012) concerning faculty beliefs about distance education resulted in the finding that "nearly two thirds [faculty members] say they believe that the learning outcomes for an online course are inferior or somewhat inferior to those for a comparable face-to-face course" (p. 2). Adversely, though faculty surveyed reported a dim view of online education, faculty reported they had optimism concerning "the growth of blended/hybrid education" (Allen et al., 2012, p. 3).

Concerning student learning outcomes in distance education, a meta-analysis and review of online learning studies of the research literature from 1996 through 2008 and commissioned by the U.S. Department of Education resulted in the findings: "On average, students in online learning conditions performed better than those receiving face-to-face instruction" (Means, Toyama, Murphy, Bakia, & Jones, 2009, p. ix); yet proponents for and opponents against distance learning remain divided.

Concerning the differences of opinion between traditional instructors and distance learners, this may mean the difference between digital immigrants and digital natives. Digital immigrants are older individuals who tend to teach how they were taught through holding onto the belief that face-to-face method is the only viable option for teaching students. Digital natives more frequently describe students receiving instruction that are younger and have more access to and facility of digital technology. These students are equally comfortable participating in a live class, a VC course, or in a pure online format.

Access to information at times and places convenient for them is an important concern (Allen et al., 2012; Allen & Seaman, 2013; Burke et al., 2010; Childers & Berner, 2000; Latanich et al., 2001; Martin, Lasalde, Stokes, & Romano, 2012; Stafford & Lindsey, 2007). However, a study by Stafford and Lindsey (2007) discovered serendipitous findings that older, nontraditional students, digital immigrants, derived the greatest benefit from VC courses based on higher degrees of self-perceived technical competency. Other studies have shown nontraditional learners who have real-world experiences in using technology in their day-to-day work environment experience higher levels of locus of control, self-efficacy, and greater perceived levels of technical competency (Latanich et al., 2001; Stafford & Lindsey, 2007); whereas, some studies revealed traditional students tend to prefer face-to-face courses in a traditional setting (Lőgdlund, 2010; Stafford & Lindsey, 2007). A study of dental students by Martin et al. (2012) determined that between traditional and nontraditional learners, both groups preferred VC courses over face-to-face when used for clinical case discussions (Stafford & Lindsey, 2007); however, in application during assessment phase of testing, students preferred a face-to-face environment in which the teacher was present (Mattheos, Nattestad, & Attström, 2003).

Advances in technology replaced the traditional correspondence course of the past where distance learning consisted of isolated learners who relied on the postal service to receive course curriculum and supplies; then completed and returned assignments by mail to the instructor for review and grading. Although that option may remain in some cases, it is no longer the norm among distance education options. In formal education, distance learning is more frequently participated through an online learning platform where

students and instructors access the course through personal computers (PCs; Parsad & Lewis, 2008; Radford, 2011). In some instances, it is necessary for students to work together in a physical location rather than the virtual space of online learning. In instances where students are required to participate in a course that includes a lab, for example, it is possible for instructors to use VC technology to instruct and observe multiple locations where smaller numbers of students participate to form one larger course enrollment (Burke et al., 2010; Childers & Berner, 2000; Harnar et al., 2000; Holland et al., 2004; Lőgdlund, 2010; Yates, Curtis, & Ramus, 2006).

Regarding VC technology in a distance learning environment, teachers can become isolated learners due to the extra need for acquiring new knowledge concerning unfamiliar technologies in which conventional training in instructional design and classroom management did not encompass when they were students learning to become teachers. Ocak (2011) conducted a qualitative case study and "examined problems and impediments faculty members encountered in blended learning environments…, [which] resulted in the identification of three inductive categories: instructional processes, community concerns, and technical issues" (p. 689). The outcome of the study was "that teaching blended courses can be highly complex and have different teaching patterns, which, in turn impacts successful implementation of the blended college courses" (p. 689). Ocak (2011) indicated the importance of institutional support and technical training for faculty members. Participants in the Ocak study "clearly indicated that blended learning is a way of utilizing web-based resources to replace face-to-face activities and to reduce the in-class time" (p. 693). However, also indicated were faculty concerns over the technical competence required to successfully instruct students in the new mediums

and methodologies necessary to move away from traditional pedagogy and work in a more learner-centered environment in which the instructor becomes more the facilitator and trainer in technology.

Resistance to change versus innovators of change. Ocak (2011) described blended-learning as "a harmonious balance between using web-based technologies and face-to-face instructor-led teaching" (p. 690). However, this harmonious balance may require skill sets that faculty members have not previously acquired and have little time to learn unless given extra time and training concerning technology. Ocak also reported "There is a growing concern that there is not enough time for faculty members to keep up with the latest technology, which continues to evolve, and that this constraint might dissuade faculty members from teaching blended courses" (p. 690). Ocak recommended further studies should be conducted in this area.

Ocak (2011) synthesized faculty statements concerning teaching in blended learning environments: "To be enthusiastic about trying new approaches is not sufficient" (Ocak, 2011, p. 698). Resistance to change may not rest with faculty member's unwillingness to learn technology and try new things. It may have more to do with ambiguity associated with learning new technologies while incorporating them into existing curriculum. In Childers and Berner (2000), the researchers reported: "Instructors vary in their expertise and affinity for distance learning practices. This team benefitted from the fact that the instructor was a self-directed learner and an early adopter of technology and classroom innovation" (p. 64). Childers and Berner added that in situations where the instructor was not an innovator or tech savvy, more faculty training would be required due to the more time and resource intensive requirements needed to

develop a distance learning course that incorporated VC technology. Childers and Berner (2000) concluded in their study that "A distance education course forces an instructor to face pedagogical and technological issues and problems he might not face in a typical course" (p. 64). In Ocak (2011), the number one reason instructors gave for resisting blended courses was the complexity of the instruction. Faculty members who were not previously trained to use online or blended learning technology found it difficult to adopt and use them to teach courses. Institutional support was another major reason for resistance to adopt distance learning technology. Finally, difficulty in learning the complexities involved also were a main reason for resistance among faculty members in higher education. In many ways, faculty members become nontraditional learners of VC technology in a time when they prefer not to learn new techniques for facilitating courses. Renes and Strange (2011) stated that instructors who did not grow up around technology "often struggle with adapting their teaching to the available formats" (p. 205).

Nontraditional learners. Students 25 years of age and older are termed nontraditional students and comprise nearly two thirds of enrolled college students (NCES, 2013). Further, study of nontraditional learners show them to be more than separated by age. According to Radford (2011) nontraditional learners tend to have families and full-time jobs. For nontraditional learners to be successful students they must have the availability of time to engage in academic studies after family and work responsibilities have been satisfied. Two theories that apply to adult learning are Malcolm Knowles' *Andragogy* and Howard McClusky's *Theory of Margin*.

Andragogy. Schlosser and Simonson (2010) defined Malcolm Knowles' theory of adult learning:

> Andragogy is a set of assumptions based upon how adults learn best, formalized in 1970 by Malcolm Knowles who based the theory upon four premises: 1) adults are self-directed in their learning; 2) adults have much more personal experience they bring to their learning; 3) adults are focused on the developmental tasks of their social roles; and 4) adults focus toward learning shifts from subject-centeredness to one of problem-centeredness. (p. 89)

When considering nontraditional students and distance learning, many authors agree on the compatibility between learning style and distance learning mediums (Brooks & Grover, 2004; Radford, 2011; Stafford, 2005). Knowles' first assumption that adults are self-directed in their learning is a good match regarding the importance of distance learner's ability to maintain self-discipline and motivation to complete assignments outside the external motivation from a teacher-centered environment (Latanich et al., 2001; Stafford, 2005; Stafford & Lindsey, 2007). Concerning assumption two: adults have more experiences they bring to their learning environment. Life and work experiences of the older, nontraditional learner, including experience with VC technology and instructional media in the work environment, in addition to working knowledge of the concepts learned in the course, contribute to better learning outcomes as compared to traditional, inexperienced learners (Latanich et al., 2001). Hoyt and Shirvani (2002) stated, "The use of compressed video is more a natural phenomenon than a revolution in education" (p. 18). Some examples of this may include Skype or GoToMeeting as a desktop VC technology. Knowles' third assumption that adults are focused on the developmental tasks of their social roles is a contributing factor that ensures that the adult learner engaged in distance learning is not an isolated learner (Burke et al., 2010; Lőgdlund, 2010; Stafford, 2005; Stafford & Lindsey, 2007). Finally, the fourth assumption—adult learners are focused on problem-centeredness or problem-based learning—meaning that the nontraditional student is solution-oriented and focused on the

application aspect of learning, which contributes to retention and facility of new skills learned (Bynum, Cranford, Irwin, & Denny, 2002; Latanich et al., 2001; Lőgdlund, 2010). Concerning these aspects of the nontraditional learner, distance learning options do not inhibit learning outcomes in these older students; rather, they contribute to positive learning outcomes (Brown & Fraser, 2011; Carter, 2001; Lőgdlund, 2010).

Theory of margin. Howard McClusky was known for his theory based on the function of time as the necessary surplus after family and work demands have been taken care of in order for adults to successfully participate in academic pursuits (Main, 1979). Adult learners must have a margin of time or capacity available to be able to successfully engage in studies in formal education. According to Liu, Gomez, Khan, and Yen (2007), family obligations and work demands are listed among the top reasons why students drop online courses. Latanich et al. (2001) stated that the appeal of distance education for older learners is in part due to family, marriage, and work responsibilities; and, as such they are less likely to have time to attend courses in a traditional manner. Therefore, they are "more likely to complete courses at a distant site and are likely to be older than non-distance learners" (p. 5).

One interesting aspect of nontraditional learners is that the main reason they attend college is to attain degrees necessary for career advancement; as such, nontraditional adult learners are highly internally motivated (Brooks & Grover, 2004). According to Schaefer (2010), older nontraditional learners experience a sense of urgency that "the time for degree completion is running out" (p. 77); therefore, nontraditional learners make degree completion a priority and adjust their resources to make time to engage in academic studies (Schaefer, 2010).

Learner-centered education. A point of argument and debate is the difference between teacher-centered and learner-centered education. Traditional pedagogy has been described as teacher-centered delivery of materials in a learning environment; whereas learner-centered teaching removes the teacher from the center as dispenser of information and places him or her in a position as the facilitator of learning as a student interacts with learning materials. Distance learning options are considered learner-centered; whereas classroom-based or face-to-face courses are considered to be teacher-centered. In blended-learning environments such as those facilitated through VC technology, the most important aspect of the teaching environment is the student's ability to interact with the materials to be learned. When VC technology is used correctly, there appears to be no significant difference in learning outcomes. However, when students are considered from a qualitative point of view, opinions vary as widely among students as it does with teachers (Carter, 2001; Childers & Berner, 2000; Holland et al., 2004; Karal et al., 2011; Lőgdlund, 2010; Martin, 2005; Stafford & Lindsey, 2007; Yates et al., 2006).

State of Knowledge Problem Summary

No significant difference phenomenon. Russell (1999) is linked with the no significant difference argument between mediums. The studies referenced in the present literature review support the argument that there appears to be no significant difference in learning outcomes when considered from a quantitative perspective. Clark (2012) stated: "The question driving the debate is whether media such as computers and television are able to influence the learning of anything, by anyone, anywhere" (p. ix, Preface). Though results from the review of research contained in the present study agree with Clark, there is a question of whether certain aspects of VC technology may inhibit the exchange of

content or student's ability to receive the information as clearly as one might when sitting in the front row of a classroom and in front of the teacher delivering a lecture. If Clark's (2012) analogy of the truck taking groceries to market holds true; then learning is about the message and not the medium, which explains the no significant difference learning outcomes in quantitative research findings. However, to take the groceries to market analogy further: if the customers need the meats and produce to be kept cold or frozen, while nonperishables kept dry and at room temperature; various technologies are needed to preserve the integrity of the groceries while transporting them to multiple or remote locations where specific groceries may otherwise be unavailable to consumers.

When considering distance learning technologies such as VC technology, there remains an unsettled argument regarding the validity and uncompromised quality of instruction (Allen et al., 2012; Burke et al., 2010; Campbell & Swift, 2006; Lőgdlund, 2010; Magiera, 1994; Mattheos et al., 2003). However, the issue is not to settle the debate; rather, the concern is to utilize the medium best suited to deliver instruction to students at a distance. Concerning the merits of face-to-face delivery of instruction to students as well as distance learning technologies to students who are prohibited by geography or other physical conditions, distance learning options that assist students in participating in academic courses from a distance, merit consideration. Multiple studies have shown that instruction delivered at a distance using VC technology produce academic outcomes comparable to face-to-face (Brooks & Grover, 2004; Burke et al., 2010; Holland et al., 2004; Karal et al., 2011; Larson & Sung, 2009; Lőgdlund, 2010; Magiera, 1994; Mattheos et al., 2003; Renes & Strange, 2011; Stafford & Lindsey, 2007); yet many faculty members remain unconvinced that the plethora of studies merit

consideration that distance learning options yield equivalency (Allen & Seaman, 2011; Allen et al., 2012; Beck, 2010; Ocak, 2011; Parker, Lenhart, & Moore, 2011; Radford, 2011).

Implementation in academe. Previously discussed were similarities and differences between adoption of an innovation by individuals and adoption of an innovation by organizations. Once a large organization has adopted an innovation in technology, the issue becomes more the implementation of the innovation. According to Rogers (2003), there are three types of innovation-decisions in large organizations:

> *Optional innovation-decisions,* choices to adopt or reject an innovation that are made by an individual independent of the decisions by other members of a system … *collective innovation-decisions,* choices to adopt or reject an innovation that are made by consensus among the members of a system; and … *authority innovation-decisions,* choices to adopt or reject an innovation that are made by a relatively few individuals in a system who possess power, high social status, or technical expertise. (p. 403)

Concerning these three types of innovation-decisions in academe, Rogers (2003) stated: "Collective innovation-decisions usually have greater sustainability than do authority innovation-decisions" (p. 429). The optional innovative-decision is based upon the contingency that an organization adopts an innovation first; then individuals are given the option to adopt or reject the particular innovation.

Though other industries show that mandates from organization leaders facilitate the rapid adoption process of an innovation within an organization, Fullan (1993) reported that in academe, mandates concerning adoption of an innovation prove counter to Rogers' (2003) assertion regarding large organizations. Concerning academia: Warford (2005) stated "Authoritarianism in the decision-making structure is negatively correlated with educational diffusion" (p. 8).

Pro-innovation bias. Rogers (2003) noted:

> Pro-innovation bias is the implication in diffusion research that an innovation should be diffused and adopted by all members of a social system, that it should be diffused more rapidly, and that the innovation should be neither reinvented nor rejected. (p. 106)

Rogers described pro-innovation bias as "one of the most serious shortcomings of diffusion research" (p. 106). In organizations where a mandate to adopt an innovation is issued, rapid diffusion without modification typically occurs. However, in academe, there is resistance to adopt. This occurs particularly in the case of the last group to adopt, known as laggards (Rogers, 2003). This frustrates innovators and proponents of the technology under consideration. Rogers stated that "Successful diffusion leaves a rate of adoption that can be retrospectively investigated by diffusion researchers, while an unsuccessful diffusion effort does not leave visible traces that can easily be reconstructed." (p. 110). Rogers also stated that rejected or discontinued innovations in organizations were less likely subjects of interest to researchers since they did not follow the normal S-curve of adoption: "Conventional methodologies used by diffusion researchers led to a focus on investigating successful diffusion" (Rogers, 2003, p. 110). Researchers, therefore, became a contributing factor in pro-innovation bias.

Pro-innovation bias also occurs when diffusion research is funded by product manufacturers or those charged with distribution of an innovation known as *change agencies*. When innovations are approached with the intention of influencing the adoption of an innovation, bias occurs. Rogers (2003) stated: "This aspect of the pro-innovation bias may be especially dangerous because it is implicit, latent, and largely unintentional" (p. 111). In addition to influence from change agencies, researchers sometimes select an innovation of study "on the basis of which new ideas look

intellectually interesting to the investigator. The researcher often chooses to study an innovation with a relatively rapid rate of adoption" (Rogers, 2003, p. 111). Rogers stated: "The problem is that we know too much about innovation successes and not enough about innovation failures" (p. 111). Rogers recommended that a study of a diffusion that did not fully adopt "might be more valuable in an intellectual sense" (p. 111).

Pressure to innovate. Glasgow, Niederhauser, Dunphy, and Mainous (2010) stated: "Innovative approaches to clinical nursing education are clearly needed in this era of patient complexity, technology and informatics, limited student clinical placements, and demands for learning experiences outside the traditional acute-care settings" (p. 23). Recommendations by the FCN (2013b) included "New methods of education, clinical and didactic, should be developed to accommodate the style of younger generations, address the shortage of clinical capacity, and prepare newly licensed RNs to work in nontraditional settings" (p. 2).

In the Florida College System Annual Report by the FLDOE (2013), the college in this study is listed as one of the largest colleges in the state. Additionally the college is listed among the top producers of nursing school graduates in the United States (Borden, 2012). Also reported was that the majority of students (63%) were part time and averaged 26 years of age (FLDOE, 2013). Given the statistic that almost two thirds of undergraduate students are 26 years of age and above, the notion of the traditional college experience only applies to one third of undergraduate students who participate in on-campus ground-based classes designed to be the next step after high school for students 18 to 24 years of age (Beck, 2010; Schaefer, 2010). As such, these factors provide considerable pressure to administrators and faculty to create programming that is

compatible and consistent with the needs of the nursing community and the general student population.

Another issue is the polarization between administrators and faculty members in higher education regarding the efficiency and effectiveness of using distance learning technology to teach learners at a distance (Allen & Seaman, 2013; Parker et al., 2011). As more and more nontraditional learners return to school to complete undergraduate degrees, more and more studies show a mismatch between the traditional college experience and the nontraditional learners who do not fit the demographic mold of the pedagogy to which they are subjected (Martin et al., 2012; Schaefer, 2010). Frequently when given the option, nontraditional learners prefer to participate in education from a distance rather than experiencing the inconvenience of commuting to a campus and sitting in classrooms oftentimes with students approaching half their age. It has been substantiated that nontraditional students have a preference for participating in studies with students of the same age group and from similar situations referred to as homogeneity (Allen & Seaman, 2013; Allen et al., 2012; Karal et al., 2011; Rogers, 2003). Under these circumstances it is reasonable for administrators to focus on the more appealing aspects of distance learning from the standpoint of revenue producing innovations that will benefit the institution financially, while utilizing distance-learning technologies that have proven to produce no significant difference in learning outcomes (Karal et al., 2011; Schaefer, 2010; Stafford & Lindsey, 2007). In this scenario, there is considerable pressure for academic centers to build courses and facilitate learning through the use of distance-learning venues such as VC technology.

System blame. Rogers (2003) stated: “A frequent error is to overstress

individual-blame in defining a social problem, and to underestimate system-blame. *System-blame* is the tendency to hold a system responsible for the problems of individual members of the system" (p. 119). Rogers suggested "A more careful analysis might show that the innovation is not as appropriate for ... later adopters" (p. 121).

Gaps and Limitations of the Literature

Rogers (2003) stated the need for more studies concerning receivers of innovations in education. A search for extant literature on diffusion of VC technology from the perspective of students was limited. A study conducted by Burke et al., (2010) stated that 14 databases were searched to locate 16 studies that used VC technology to deliver course instruction in the sciences. Other researchers also stated the limited research concerning VC technology (Karal et al., 2011). Additionally, many of the studies previously conducted were quantitative studies more concerned with learning outcomes when compared to face-to-face and online courses (Kimmel & Grubbs, 2000). Studies seemed more directed to confirm the no significant difference phenomenon than to validate the equivalence of distance learning to face-to-face (Lou, Bernard, & Abrami, 2006; Mattheos et al., 2003). A few studies were mixed methods including the quantitative aspect as well as qualitative aspects through surveys, questionnaires, and observations (Campbell & Swift; 2006; Wells & Dellinger, 2011). Fewer still were qualitative studies directed to analyze how students perceived the quality of education when facilitated through VC technology. Important to the present study were qualitative case studies involving nontraditional students participating in academic studies in university settings, of which few were found. Qualitative studies that were found typically showed no significant difference in learning outcomes while at the same time

students from the broadcast site preferred face-to-face and considered connection to the distant sites a distraction; whereas those at the receiving sites tended to be more accepting of the VC technology (Mattheos et al., 2003).

K-12 research. A meta-analysis report on distance education by Means et al. (2009) reported that of the "more than 1,000 empirical studies of online learning identified" (p. ix) between 1996 through July 2008, only 9 were identified regarding K-12 learners that contrasted "between an included online or blended learning condition and face-to-face (offline) instruction" (p. xii). Although Picciano and Seaman (2007) reported that approximately one million K-12 students participated in online courses in the 2007–08 academic year; few studies involved VC technology per se. More recent studies show continued acceptance and adoption of technology use in K-12 education with VC technology included as part of the blended learning options in education (Archambault & Crippen, 2009; Simonson et al., 2012).

Staker and Horn (2012) identified four emerging blended learning models while investigating "over 80 programs in the K-12 sector" (p. 1). The four models: rotation model, flex model, self-blend model, and enriched-virtual model were designed to provide interaction with the instructor, subject matter, other students, and various levels of face-to-face instruction and online for a blended-learning model, based on theories of disruptive innovations. Falloon (2012) "explored students' perceptions of the effectiveness of the VCs as an interactive medium for developing content knowledge, identified factors influencing their level of interaction during the conferences, and exposed issues when using VCs for highly specialised [sic] activities" (p. 1). Through VC technology, high school seniors were able to connect with scientists of a government

owned research institute to expose students to scientific research and practice in the scientific community. Additionally, no significant differences in learning outcomes were reported (Bynum et al., 2002).

Graduate studies research. Graduate students typically fit the description of nontraditional learners in that graduate students tend to be above the age of 25. Balkin, Buckner, Swartz, and Rao (2005) conducted a qualitative case study to determine classroom management issues and interactivity between student-student and instructor-student interactions at remote sites and close sites. Though there was no significant difference in classroom performance, interactivity between students and instructor was negatively impacted. The outcome from the student interviews were that "issues of classroom management, facilitation at remote sites, and responsibilities of students versus those of instructor were identified as significant themes" (p. 363). Additionally, a discussion of findings resulted in recommendations for improving interactivity between instructor and distant site students in VC courses. The study provided recommendations for improvement regarding classroom management suggestions for the instructor. Similar findings were reported in multiple studies (Bynum et al., 2002; Cambiano, De Vore, & Snow, 2001; Kimmel & Grubbs, 2000; Wells & Dellinger, 2011).

Falkner and Cambiano (2004) investigated "the effect of compressed video learning environments on academic achievement of graduate students" (p. 32). The outcome was that "the students who participated in the compressed video learning environment had a higher achievement based on average, than students involved in the traditional setting" (p. 32). An investigation of the combined experiences of undergraduate and graduate students participating in VC courses by Owens, Hardcastle,

and Richardson (2009) resulted in three key findings: "The three key issues identified by participants were a sense of isolation, the attitudes and knowledge of the teaching staff; and students' knowledge and use of learning technologies" had impact on course outcomes (p. 53). These results were emerging themes among other studies reviewed (Balkin et al., 2005; Renes & Strange, 2011).

Undergraduate studies research. Case study research concerning perceptions of undergraduate nontraditional students participating in VC technology, though limited in number, were still available for review. Quantitative studies were more readily available as anticipated (Rogers, 2003). Several quantitative studies combined respondents of undergraduate students with graduate-level students to enhance the sample size to validate the studies (Campbell & Swift, 2006). Several studies used the hypothesis testing paradigm to determine levels of student satisfaction based on whether the students were located in the broadcast site with the instructor present or the receiving site away from the instructor (Campbell & Swift, 2006). A meta-analysis study conducted by Lou et al. (2006) compared 218 findings from 103 studies to determine "how media were used to support DE [distance learning] pedagogy" (p. 141).

Regarding student preferences for VC courses over face-to-face, students who attended main campus courses had a preference for face-to-face; however, distance learning students were glad that VC technology was an option as compared with the alternative of no course offerings (Magiera, 1994). In a qualitative study by Karal et al. (2011), students were observed during the semester throughout the entire course. Semi-structured interviews revealed that students were not told the course was going to be VC. Some students resisted and refused to take the course while others showed reluctance and

prejudice against it at the start. Throughout the course, the researcher noted changes of opinions and acceptance of the VC technology. As they used the controls and got familiar with the technology, they became comfortable and had good exchanges with the instructor and students from other sites. The consensus was to adopt the technology for students but to notify students during enrollment that the course was VC. Burke et al. (2010) studied international videoconferencing to link undergraduate students from the United States with graduate students in Germany for cross-cultural studies. Students were unanimous in their recommendation for more courses conducted in this manner. Carter (2001) studied nontraditional student attitudes concerning VC courses to complete 2-year degree programs with results that students preferred the flexibility when compared to face-to-face traditional classes.

Not every study resulted in decisions by undergraduate students to adopt VC technology. One such study by Harnar et al. (2000) resulted in 38% of the participants stating that they would not take VC courses in the future. Cause for this, however, was related to "instructor characteristics" rather than technology (p. 41). Even with its flaws, 57.5% planned to take additional VC courses and the remainder undecided. It was also reported that 86% of the students took the course as a requirement for their major. It was not stated whether these courses were offered in face-to-face options during the same semester.

Adult Learners' Transition to College

Learner expectations. More and more nontraditional students return to college every year to complete undergraduate degrees. In fall 2011 a reported total of 18.1 million undergraduate students attended college in the United States. Of those attending

private nonprofit institutions, 40% of undergraduate students were nontraditional learners; 25% were between 25 and 34 and 15% were 35 and older (Aud et al., 2013). According to Schaefer (2010), these adult learners return primarily motivated to earn degrees that will help them gain promotions at work or make them more marketable in the workforce. However, "they negotiate a system of higher education that is geared toward traditional aged students" (p. 68). In Stafford and Lindsey's (2007) study, traditional and nontraditional students were compared. Nontraditional students maintained stronger social interactions while participating in VC courses resulting in little criticism concerning feelings of isolation. Rather, older students expressed more appreciation for the independence and locus of control they experienced at distance learning sites. Previously discussed, these are students who have responsibilities of family and work that limit their ability to participate in studies in the traditional campus-based classes in which traditional students and traditional faculty members participate (Carter, 2001; Latanich et al., 2001).

Nontraditional students are internally motivated and require little effort on the part of instructors for external motivation (Brooks & Grover, 2005). In Schaefer (2010) these older students "expressed a common sense of urgency that the time for degree completion was running out" (p. 77). Also expressed was the timing that after their children were out of high school, it provided time to successfully transition to college for undergraduate degree completion. However, these older nontraditional learners during the early stages in their transition to college may require some assistance in becoming oriented to the new learning environment (Childers & Berner, 2000; Knowles et al., 2005; Merriam & Brockett, 2007; Schaefer, 2010).

Many of these students dropped out prior to the advent of the Internet. Interactive distance learning to them involved using the mail service to send and receive course instruction and final grades. Although, they may use technology in their day-to-day work and personal lives, these students need assistance in transferring their knowledge of technology to engage in academic pursuits. In Karal et al. (2011), students expressed hesitation and concern about participating in VC courses in the beginning. However, throughout the course, researchers made the observation that students became less apprehensive and more comfortable with the technology as the course progressed. The outcome was predominantly positive concerning the level of enthusiasm about participating in future studies that used VC technology. Carter (2001) summed up his research of nontraditional students participating in VC courses: "In essence, interactive distance education has become a nontraditional approach to instruction in meeting the instructional needs of the nontraditional adult learner" (p. 259).

Technology anxiety. When adult learners, nontraditional students, transition back to college, many experience anxiety over the technology they are faced with using. However, nontraditional learners typically are not discouraged to the point of dropping out; rather they persist until they overcome the technology anxiety (Stafford & Lindsey, 2007). Multiple studies listed issues with technology as reasons students dropped courses. However, noteworthy were the findings that issues with technology were typically lower on the list. Topping these lists included family- or work-related issues rather than school or technology (Lee & Choi, 2011; Park & Choi, 2009; Willging & Johnson, 2009).

Traditional instructors were discovered to exhibit the same technology anxiety as their students when faced with adapting to distance learning courses (Childers & Berner,

2000). This is also one reason why some professors resist or refuse to teach distance-learning courses (Campbell, 2012b; Ocak, 2011).

Harnar et al. (2000) proposed several activities in which faculty members as well as students could overcome technology anxiety sufficient to successfully participate in distance learning. Recommendations included providing proctors in the classroom at the distant sites; as well as having technicians readily available in the event that a technology issue developed in either the distant or the host site. Concerning self-efficacy necessary to successfully engage in distance learning courses, an unexpected finding was that "the group that could likely derive the greatest benefit from Internet enabled DE [distance education]—older nontraditional students—also may be more comfortable with the use of that technology, based on their higher reported degrees of self-perceived technical competency" (Stafford & Lindsey, 2007, p. 231). Childers and Berner (2000) recommended when forming a team to design distance learning courses to build in extra time when including an instructor unfamiliar with distance learning technologies due to the time required to acclimate to the nontraditional environment. In facilitating a VC course for the first time, Wise, Benavides, and Destarac (2013) recommended designating a tech-savvy student at each distant site to assist with the technology at each location to put students as well as faculty members at ease.

Further Research Differing From Past Studies

Previously discussed is the plethora of research studies conducted using quantitative methodology to study K-12 and graduate-level college students. These studies were predominantly conducted from an innovation bias perspective that the innovation should be adopted by all members in the network. After reviewing multiple

studies concerning diffusion of innovations in education, several trends emerged.

Qualitative over quantitative. In reviewing extant literature concerning adoption of innovations in education, a trend in research methodology surfaced. The large majority of studies conducted were from a quantitative methodology predominantly to determine whether the no significant difference phenomenon existed when comparing mediums or modes of delivery (Bynum et al., 2002; Magiera, 1994; Mattheos et al., 2003). A number of studies compared face-to-face with blended-learning using VC technology (Harnar et al., 2000; Martin et al., 2012). Other studies incorporated a mixed methods approach, which were predominantly quantitative with few selected interviews for triangulation (Beck, 2010; Holland et al., 2004). Very few studies were located and reviewed examining nontraditional undergraduate student perceptions of VC courses (Karal et al., 2011; Lőgdlund, 2010; Yates et al., 2006). Rogers and Jain (1968) observed that "diffusion research has largely been a tool on the side of sources, not receivers of innovation diffusion" (p. 1). Additionally, Rogers (2003) stated that more studies should to be conducted from the student perspective of the innovation.

Student perspective over student performance. Many studies were comparison studies to determine if there were any significant differences in learning outcomes based on variables of grade point averages (GPA) and retention or dropout rates (Beck, 2010; Brooks & Grover, 2004; Burke et al., 2010; Holland et al., 2004; Karal et al., 2011; Lőgdlund, 2010; Magiera, 1994; Mattheos et al., 2003; Renes & Strange, 2011; Stafford & Lindsey, 2007). Though these variables were important and led researchers to report no significant difference outcomes between face-to-face and distance learning options to include VC courses, these might have been studies that Rogers (2003) referred to when

considering pro-innovation bias. However, when studies were conducted to include student perspectives concerning VC technology and various aspects considering student-teacher, student-student, or student-technology relationships during a VC course, there were differences in opinion among students. Harnar et al. (2000) developed an instrument "to assess students' knowledge, attitudes and behaviors associated with a college-level accounting course presented via distance education using compressed video" (p. 37). This instrument could predict with 80% accuracy, "student choices about taking future distance education courses" (p. 37). The results of the study indicated that students had better experiences when rooms were smaller, a proctor was onsite in the classroom thus preventing the sense of isolation, and a technician onsite to quickly take care of any technical issues that occurred. These recommendations resulted in the majority of students reporting a positive experience with intentions to take more distance learning courses. The course resulted in no significant differences in learning outcomes in the mediums.

Other studies reported the typical no significant difference in learning outcomes; however, there were differences in student opinions based on their proximity to the instructor. Some researchers reported that students who were located at the broadcast site with the instructor viewed VC technology as a distraction that diminished their expectations as campus-based students; whereas, the students receiving the courses via VC technology at the distance sites were grateful that the courses were available to them (Campbell & Swift, 2006; Magiera, 1994). Karal et al.'s (2011) study also resulted in no significant difference learning outcomes. When participants were interviewed concerning whether the technology should be adopted, the majority believed that it should be with a

few lagging behind recommending more experience in courses before a decision could be made to adopt or reject VC technology for undergraduate courses. Concerning second year dental students, Mattheos et al. (2003) stated: "Internet-based videoconferencing can successfully facilitate a highly structured assessment, although students seemed to prefer classroom assessment" (p. 278).

Reluctance to adopt. Later adopters are reluctant to adopt an innovation until substantial risk has been eliminated (Rogers, 2003). Laggards in education need time and feedback data after trialing an innovation in order to determine whether an innovation is right for them. They typically do not succumb to pressure tactics or formal demands to adopt. However, when enough data are provided for laggards to make an informed decision to adopt, they will; providing the innovation is appropriate for this final group to adopt and implement into the system. (Allen et al., 2012; Allen & Seaman, 2013; Crow, Cheek, & Hartman, 2003; Ocak, 2011; Rogers, 2003). When laggards resist adoption, members in the system who are pro-adoption tend to blame the laggards for resisting the adoption. However, Rogers (2003) stated that it is not always the laggards that should be blamed for resistance to adopt; system blame is often the case.

System-blame. According to Rogers (2003), system-blame "is the tendency to hold a system responsible for the problems of individual members of the system" (p. 119). This is in contrast with individual-blame, which tends to blame individuals in a system for not adopting an innovation that the majority wants or expects to be adopted. Pro-innovation bias tends to place blame on individuals for resisting or rejecting an innovation. Rogers (2003) questioned whether diffusion research might have taken a different direction if "the Ryan and Gross (1943) hybrid corn study had been sponsored

by the Iowa Farm Bureau Federation (a farmer's organization) rather than by the Iowa Agricultural Experiment Station" (p. 118). A second example was given concerning a Columbia University study might have been different had it been sponsored by "the American Medical Association rather than by the Pfizer Drug Company" (Rogers, 2003, p. 118). An inherent pro-innovation bias and resulting individual-blame could be minimized or eliminated in studies when evaluated from the end-user perspective.

Although the innovation of VC technology may not be suitable for all applications in its unaltered form, none of the studies mentioned in this literature review completely rejected its use in facilitating courses to nontraditional undergraduate students. However, there were recommendations for adoption with modifications, or specific applications considered better than others (Allen et al., 2012; Balkin et al., 2005; Childers & Berner, 2000; Crow et al., 2003; Karal et al., 2011; Lőgdlund, 2010; Mattheos et al., 2003; Ocak, 2011; Yates et al., 2006).

Adoption in academe. Hall et al. (1977) discussed a late phase in innovation. This comes after trialing an innovation and the consequences are evaluated through collaboration of information. This is a point where teachers or facilitators are able to evaluate an innovation's effect on the students. Without that key element, adoption or implementation of an innovation stalls in the process leaving laggards with less than optimal information to make a decision.

The studies in this literature review were conducted with the intention to provide results with recommendations that the intended audience would have information in which to make a decision to adopt, modify, or reject VC technology for use in facilitating nontraditional undergraduate student programming (Allen & Seaman, 2013; Balkin et al.,

2005; Capo & Orellana, 2011; Crow et al., 2003; Ocak, 2011).

Evidence of Importance of the Problem in Literature

For an academic organization that needs new growth through expansion resulting in the adoption of an innovation, adoption of VC technology could be significant. In the case of the college under study, it could mean new growth as a result of extending academic opportunities to the distance campuses that are strategically located in large metropolitan areas. With the adoption, this would mean extending opportunity to undergraduate students who are unable to pursue their undergraduate degrees at the main campus of the college (Richardson et al., 2012; Wise et al., 2013). Many of these students are considered nontraditional students who are beyond high school graduation and have credits accumulated from other college pursuits; yet, still possess no undergraduate degree. These are students who are motivated to return to college to finish their degrees in order to be competitive wage earners, many of which do not possess the self-efficacy to participate in pure online coursework. They would, however, transition back to school, if shown options that were convenient and non-threatening (Schaefer, 2010).

Controversy in adoption research. Rogers' (2003) adoption of innovations theory is used in marketing, economics, government, and education applications, among others. It has been used in more than 5,000 studies globally since its inception in 1962 (Bainbridge, 2012). Though the theory itself is rarely questioned, Rogers (2003) made observations and recommendations for improvement in research application of the theory; specifically, in its use in adoption studies in education. In his chapter on contributions and criticisms, Rogers recommended that more studies be conducted using a qualitative approach rather than quantitative, which would overcome the issue of taking

a snapshot in time or getting data from an isolated point along the adoption scale. Additionally, several authors recommended that information gained from students who participated in VC courses would provide valuable information to teachers and facilitators, information vital in the process of adoption of the innovation for those who have primarily maintained status quo, and have been less than optimistic concerning adopting innovations as quickly as the other adopters in the process (Hall et al., 1977; Rogers, 2003; Warford, 2005). Additionally, pro-innovation bias often occurs when the promoters of the innovation assume that an innovation "should be diffused and adopted by all members … diffused more rapidly … should be neither reinvented nor rejected" (Rogers, 2003, p. 106). Rogers & Jain (1968) argued that "diffusion research has largely been a tool on the side of sources, not receivers of innovation diffusion" (p. 1). Other researchers made similar observations (Fullan, 1993; Warford, 2005). Conducting case study research focused on the end-user assists in overcoming pro-innovation bias, while following Rogers' recommendation to conduct qualitative research to extend the body of knowledge regarding receivers of an innovation.

Resistance in Education Adoption

Mandatory versus voluntary. An interesting and important observation concerning adoption of innovations is that adopters in education do not appear to follow the adoption path consistent with other industries when mandated by high ranking officials. Typically, the adoption process is accelerated in an organization when it is mandated from the point of leadership; however, in education the adoption process negatively correlates with mandates from administrators. In many cases it stalls the process of adoption altogether (Fullan, 1993; Rogers, 2003; Warford, 2005). Frank, Zhao,

and Borman (2004) recommended an informal approach communicated by change agents through social relationships to reduce resistance and facilitate the process of adoption.

Intuition versus reality. Intuition plays a vital role in motivating the pursuit of any prospective research investigation. It is often discussed as bias. When researchers conduct investigations of opportunity by determining issues that need to be studied, a certain amount of bias can frustrate or confound the research (Clark, 2012). However, the point of the investigation is to move what is intuitive into what is known through the careful and viable approach of the instrumental case study (Creswell, 2008; Denzin & Lincoln, 2000; Lewthwaite, Murray, & Hechter, 2012; Parsons, 2012; Stake, 1995; Wofford, Ellinger, & Watkins, 2012).

A second reality previously determined through quantitative studies conducted that gave credence to the 'No Significant Difference' argument between face-to-face and distance courses (Russell, 1999). The reality may be there is no significant difference quantitatively; however, there may exist significant difference in mediums when considered from a qualitative perspective. The aim of this study is to gather qualitative data through observations, interviews, focus groups, and EOC summaries to determine nontraditional undergraduate student opinions of distance education when facilitated through VC technology. The results should provide qualitative results sufficient to move faculty and administrators from the knowledge stage through the persuasion stage and into the decision stage of the adoption process regarding the diffusion of the innovation of VC technology when used to facilitate academic coursework to nontraditional undergraduate nursing students.

Though, faculty and administrators may hold intuitive beliefs regarding adoption

and implementation of VC technology for undergraduate students, the present study was designed as a non-biased study in order to gain understanding from the student's perspective. The findings should bring clarity concerning nontraditional degree-seeking undergraduate student experiences of VC facilitated courses.

Unique Contribution of Dissertation Study

Conducting a qualitative instrumental case study from the perspective of receivers of the innovation in education provided a unique contribution in diffusion of innovation research (Rogers, 2003). The participants comprised undergraduate nursing students in their second semester of nursing school; the majority of which experienced courses facilitated through VC technology for the first time. The second semester nursing students in the present study experienced VC technology use to facilitate coursework for the first time in their nursing courses as it was not used during their first semester; with the exception of the first session during student orientation. The population consisted of students from the broadcast site (main campus) where the school of nursing originates and the receiving site (regional campus) where 22 additional nursing students attend classes at the distant campus. However, using a team approach, each of the five instructors taught an equal amount of teaching segments; therefore, instruction was broadcast from both sites depending on which campus each instructor was located. Both campuses involved broadcasting and receiving course instruction through VC programming in the course studied; therefore, rather than being referred to as broadcast and receiving sites, the campuses were referred to as main campus and regional campus locations. This will clarify any confusion between campus locations for the purpose of the present research study.

Each of four instructors located at the main campus had responsibility throughout the semester to teach an equal amount of class instruction and broadcast to the regional campus site; while a fifth instructor located at the regional campus broadcast her teaching segments from her site during the rotation. By design, instructors were present at all times during each class period and at both locations. These two elements result in overcoming any possible imbalance or confounding of the present study due to the larger group from the main campus and the smaller group at the regional campus. Instructors present at both sites added consistency between each location. Regarding participant interviews, this added a unique perspective because each student experienced VC technology from the broadcast site and from the receiving site, which provided each interviewee the opportunity to compare and contrast their own experiences. Considering there were significantly more students located in the main campus site (n=85) as compared to students located at the regional campus (n=22); incorporating both experiences from each participant provided a unique experience on which they could share opinions. This resulted in balancing the responses of participants concerning both broadcast and receiving location perspectives. Though this study was not intended to be a comparative study, the course design provided opportunity for each student to discuss VC courses from both perspectives. Time is one of the factors in diffusion of innovations theory (Rogers, 2003). By observing and interviewing students at selected intervals throughout the term, emerging themes concerning the adoption of an innovation over time, added to the value of each interview.

Instrumental case study design. Adoption of innovations was the theoretical basis for conducting this study. The theoretical perspective for studying the phenomenon

was a qualitative instrumental case study design. A case study is a qualitative design where an individual or small group of individuals are the central focus to understand the phenomenon under investigation (Creswell, 2008). Yin (2009) stated: "In this sense, the case study, like the experiment, does not represent a 'sample,' and in doing a case study, your goal will be to expand and generalize theories (analytical generalization) and not to enumerate frequencies (statistical generalization)" (p. 15). An *instrumental* case study is a study in which the phenomenon under investigation is the central focus; however, the results of the study are used to provide information for another, complementary purpose (Denzin & Lincoln, 2000). In this present study, the results were used to provide deans and faculty members of undergraduate studies with qualitative information from undergraduate student perspectives. According to Hall et al. (1977), this information is crucial to advance decision makers along the adoption process from the knowledge stage through the persuasion stage and into the decision stage to fully adopt, adopt with modifications, or reject the innovation of VC technology in extending academic programming to nontraditional undergraduate students.

Nontraditional undergraduate student participants. The present study focused on nontraditional undergraduate students who participated in VC courses. Many such studies were conducted at universities throughout the United States and most of which incorporated quantitative methodology. Magiera (1994) studied students in a compressed video course consisting of 20 students at the remote site and 15 at the send site of the course. Through means of pre- and posttests, the author was able to determine there was no significant difference in learning outcomes quantitatively. However, the difference qualitatively was that students who participated in the study from the broadcast site

where the instructor was present expressed more dissatisfaction than the students from the receiving site. Students at the receiving site expressed gratitude for the opportunity to participate in courses made available to them; whereas, students in the class broadcast from the main campus "perceived they were not getting their money's worth with a compressed video format" (Magiera, 1994, p. 276). Some students at the remote site commented that they were given no prior notification of a teleconference course or they would not have enrolled. A study conducted by Stafford and Lindsey (2007) differentiated between traditional and nontraditional students for comparison of outcomes. The study revealed that nontraditional learners performed better in the VC course due to stronger student motivation in the nontraditional learners in addition to their "significantly stronger self-perceived technical competency" (p. 230). Additionally, it was discovered that the older, nontraditional learners were more socially oriented, which correlated with student satisfaction with VC courses. Lőgdlund (2010) argued that students participating in VC courses were not interacting as part of learning, but reduced to participant observers. He criticized that VC courses were "organized to fulfill the requirements of practice rather than to promote learning" (p. 195). In a study conducted by Campbell and Swift (2006) there were no significant differences in learning outcomes; however, when student perceptions were compared, "Onsite students found the [distance learning] classroom more distracting than did remote location students, and the lack of alternative course delivery formats was more relevant to remote than to onsite students" (p. 170). Adversely, in a study of adult learners in VC courses, Carter (2001) summarized that "this form of distance education also fits many needs of adult students who have become a significant part of the enrollment on college campuses worldwide" (p. 258).

Several studies were conducted to determine the difference between distance and non-distance learners. Latanich et al.'s (2001) study "investigated three individual difference variables, locus of control, the achievement-striving dimension of type A behavior, and the propensity to take risk, as potential variables that discriminate between distance and non-distance learners" (p. 3). Research conducted by Carter (2001) studied attitudes of adult learners participating in interactive distance education courses; and Brooks and Grover (2004) conducted a study to "ascertain the perceived personal, professional, and family impact of an accelerated degree completion program tailored for working adults" (p. 149). Each of these studies incorporated VC courses as the distance learning option. Other course delivery modes have been compared to VC technology for their benefits and/or deficits concerning academic course delivery options regarding nontraditional undergraduate students, which predominantly reaffirmed the no significant difference phenomena (Brooks & Grover, 2004; Campbell & Swift, 2006; Carter, 2001; Latanich et al., 2001; Lőgdlund, 2010; Magiera, 1994; Stafford & Lindsey, 2007). Given findings of no significant difference in learning outcomes between media, more qualitative studies concerning learner satisfaction were the overall recommendation for future studies of undergraduate learners participating in distance education.

Distance Learning Technology Options

Distance learning options for undergraduate nontraditional learners included the predominant researched categories of online courses.

Online delivery option. Allen and Seaman (2013) stated that "Online courses are those in which at least 80 percent of the course content is delivered online" (p. 7). Though there may be a varied blend of synchronous and asynchronous activity, there are

typically no face-to-face meetings in an online format. The synchronous meeting times also tend to be less frequent than face-to-face course meeting times that confine learning interaction to a specific location and time. In Allen et al. (2012) almost half of faculty surveyed reported "increased levels of creativity, and better connection to the scholarly community and to their students" (p. 2). Concerning popularity of online courses among student populations, Allen and Seaman (2013) reported that 6.7 million students took at least one online class in 2012. To put this in perspective: "The proportion of all students taking at least one online course is at an all-time high of 32.0 percent" (p. 4). In the same 10-year study of online courses, chief academic officers were surveyed: "Only 30.2 percent of chief academic officers believe their faculty accepts the value and legitimacy of online education. This rate is lower than the rate recorded in 2004" (p. 6). The argument still remains concerning the no significant difference outcome between online delivery options and face-to-face.

Face-to-face. Allen and Seaman (2013) described face-to-face instruction include courses in which "zero to 29 percent of the content is delivered online" (p. 7). As a course delivery option, face-to-face plays a role in distance learning for the purpose of the present study in that it is the format used to describe student-teacher interaction in the broadcast site of a VC course. In several of the research studies reviewed concerning VC technology, there was delineation between the broadcast and receiving classes of a VC course. In most studies, different responses were distinguished in the two separate learner groups. In the broadcast site some students viewed VC technology as a distraction when the instructor turned his or her focus from the face-to-face students in the broadcast classroom to the distance students at the receiving sites (Crow et al., 2003; Karal et al.

2011; Lemak, Shin, Reed, & Montgomery, 2005; Magiera, 1994; Mattheos et al., 2003; Stafford, 2005; Stafford & Lindsey, 2007).

Blended-learning option. Allen and Seaman (2013) stated that "Blended (sometimes called hybrid) instruction has between 30 and 80 percent of the course content delivered online" (p. 7). Ocak (2011) described blended learning as "a harmonious balance between using web-based technologies and face-to-face instructor-led teaching" (p. 690). Blended-learning in multiple studies revealed slightly improved learning outcomes and student satisfaction ratings over pure online and pure face-to-face courses. This was reported predominantly due to the independent aspect of online studies in conjunction with the face-to-face teaching and social elements in group settings with an instructor present (Karal et al., 2011; Magiera, 1994; Martin et al., 2012; Mattheos et al., 2003; Means et al., 2009; Stafford & Lindsey, 2007).

Applications in blended-learning where VC courses were used to connect learners to instructors included student teaching certification (Hager, 2010); undergraduate finance course to geographically disbursed university students (Magiera, 1994); students in Ireland studying American history and using VC technology to connect to a United States Congressman as guest lecturer (Martin, 2005); VC technology used to proctor exams in dental school (Mattheos et al., 2003); teaching lecture-based courses in medical school (Martin et al., 2012); introductory IT courses comprised of traditional and nontraditional learners (Stafford and Lindsey, 2007); chemistry course with lab observation by VC (Holland et al., 2004); adult education writing course (Lőgdlund, 2010); and four core courses from the school of business—macroeconomics, operations management, principles of management, and advertising (Latanich et al., 2001).

Some interesting features found when comparing online, face-to-face, and blended-learning courses were consistent among authors who argued that there were indeed significant differences in learning outcomes that refute Russell's (1999) "no significant difference" phenomenon. In the meta-analysis conducted by Means et al. (2009):

> A systematic search of the research literature 1996 through July 2008 identified more than a thousand empirical studies of online learning. Analysts screened these studies to find those that (a) contrasted an online to a face-to-face condition, (b) measured student learning outcomes, (c) used a rigorous research design, and (d) provided adequate information to calculate an effect size. As a result of this screening, 51 independent effects were identified that could be subjected to meta-analysis. *The meta-analysis found that, on average, students in online learning conditions performed better than those receiving face-to-face instruction.* (p. ix, abstract)

The authors reported that the difference in standard deviation "was larger in those studies contrasting conditions that blended elements of online and face-to-face" (p. ix, abstract). The results of the meta-analysis suggest that there is an outcome difference in delivery media: that a blended-learning format can produce significant differences in learning outcomes for students.

Although researchers of comparative studies reported differences in learning outcomes, Clark (2012) might have considered them to be flawed in methodology, thus categorizing them as confounded studies. Clark stated: "Studies comparing the relative achievement advantages of one medium over another will inevitably confound medium with method of instruction" (p. 9). Many of the research studies included in this literature review were quantitative studies that statistically compared outcomes of GPA and completion percentages, which Clark could have countered: "There is evidence in these meta-analyses that it is the method of instruction that leads more directly and powerfully

to learning" (p. 7). A few studies included mixed methods and fewer still were qualitative studies that used observations, personal interviews, and focus groups as the instrument for the study.

Concerning comparative studies, Clark (2012) stated: "Five decades of research indicates that there are no learning benefits to be gained from employing different media in instruction, regardless of their obviously attractive features or advertised superiority" (p. 8). Therefore, rather than another comparative study, the present study was qualitative using classroom observations, interviews, focus groups, and EOC summaries to discover student opinions concerning participation in courses that used VC technology to narrow the transactional distance between learner and instructor. Interview questions were carefully worded and based on the following research question and subquestions.

Research Questions

According to Stake (1995), the central research question guides the study; and subquestions follow to further elaborate the central question. Creswell (2007) recommended that "a researcher reduce her or his entire study to a single, overarching question and several subquestions" (p. 108). Several studies were reviewed concerning undergraduate degree-seeking students as the focus of their research. All maintained similar central research questions that were constructed to gain understanding of whether VC technology was useful for extending academic opportunity to learners at a distance. Research by Lesniak and Hodes (2000) studied student perceptions of class interactions of two Penn State campus locations 75 miles apart. Through a survey questionnaire and selected interviews, the study attempted to gain understanding of the differences in student perceptions based on their location in relation to the instructor. The selected

interviews included qualitative questions directed toward the subquestions of the study, designed to determine whether students enjoyed learning at a distance through VC; and if given the option would they enroll in more VC courses. Similar qualitative studies were conducted at universities utilizing the use of one central research question with several subquestions for their studies (Balkin et al., 2005; Stafford & Lindsey, 2007). A qualitative study by Lőgdlund (2010) attempted to gain student perceptions of VC courses through observations, artifacts, and interviews during a 2-year period. The study sought to answer the central question of whether students preferred VC courses or face-to-face when given the option. Subquestions were directed to determine whether instructors maintain control of the classroom with students as actors, or if the control in VC courses shifts to "technical artefacts, technical design, and technicians" (p. 197). A qualitative case study conducted by Karal et al. (2011) attempted to "determine how undergraduate students perceive class via synchronous education by means of videoconferencing" (p. 279). Through a hypotheses' testing study, Stafford and Lindsey (2007) attempted to "understand differential student predispositions to respond to distance education offerings" (p. 230). A study by Childers and Berner (2000) concentrated their research on student perceptions concerning quality of their distance education experience through VC courses.

The studies previously listed gave validity to the concept of one primary central research question followed by a short list of subquestions to further elaborate the current research. Therefore, the central research question for this study was: *Is VC technology a viable course delivery option for nontraditional degree-seeking undergraduate students?* Creswell (2007) stated: "My understanding of issue-oriented subquestions is that they

take the phenomenon in the central research questions and break it down into subtopics for examination" (p. 109). The subquestions for the present study were:

1. What are the student opinions of VC technology concerning undergraduate courses at a distance?

2. Do students perceive their academic experience to be greater or lesser depending on proximity to the instructor (in the classroom or at a distance)? If the answer is yes; then, in what ways were they greater or lesser?

3. Would students participate in future VC courses if given the option? Why or why not?

These, subquestions were used to develop the protocol in which the interview script was created incorporating additional questions based on the subquestions of the present study.

Chapter Summary

This literature review briefly covered the key elements, which constitute the focus of the instrumental case study in diffusion of innovations of VC technology concerning undergraduate degree-seeking nontraditional learners. Points covered included a brief history of diffusion of innovations research, the theoretical perspective within which the present study was grounded, and the selected methodology as recommended by Rogers (2003) concerning diffusion of innovations theory. This included a detailed breakdown of key elements in the adoption of innovations by individual consumers and the process of implementation by organizations after an innovation has been selected. Additionally, detail was given regarding individual adopter categories that apply to both individual adopters and business units within large organizations.

The historical context of the study included a brief history of distance education

to include innovations in technology with a primary focus on VC technology, which is the medium at the heart of the present study. This included a summary regarding the phenomenon and its importance; plus, identification of gaps and limitations of the existing literature regarding nontraditional undergraduate learners. Finally, the chapter covered a discussion of how further research would contribute to the known body of knowledge to include other studies previously conducted at universities and schools within academe and other industries in the United States and globally. Articulation of the unique contribution of the intended dissertation study in its contribution to previous research conducted concerning distance education at the masters, doctorate, and first professional degree level was highlighted.

The present study considered student opinions of VC courses in which they participated. Data for this study were gathered through personal interviews, focus groups, observations, and EOC summaries to determine whether students consider VC courses a viable option for achieving expected academic outcomes.

Chapter 3: Methodology

This chapter covers the research design, participants, instruments, and data analysis procedure for the study. Research was conducted over a period of one 16-week semester, which permitted sufficient time to conduct personal interviews, focus groups, and observations, which were later triangulated with EOC summaries provided by the college, for a thorough and comprehensive analysis. The data were disaggregated for confidentiality and contextualized in an effort to identify constructs, patterns, and themes; and to generate comprehensive findings designed to inform practice concerning the implementation of VC technology for use in distance education applications at the undergraduate level.

Aim of the Study

The aim of the study was to determine whether VC technology is a viable course delivery option for nontraditional degree-seeking undergraduate students. This was accomplished through qualitative interviews, focus groups, observations, and EOC summaries, concerning nontraditional undergraduate student opinions of courses delivered through VC technology.

Instrumental Case Study Approach

This is an instrumental case study with diffusion of innovations theory at the center and focused on VC technology as administered to undergraduate degree-seeking nontraditional learners. Creswell (2008) defined case study as "an in-depth exploration of a bounded system ... *Bounded* means that the case study is separated out for research in terms of time, place, or some physical boundaries" (p. 476). In addition to the features of a traditional case study, instrumental case study "serves the purpose of illuminating a

particular issue" (p. 476). Stake (2000) described an instrumental case study as a particular case that is examined mainly "to provide insight into an issue or to redraw a generalization. The case is of secondary interest; it plays a supportive role, and it facilitates our understanding of something else" (p. 437). Stake continued: "The case is still looked at in depth, its contexts scrutinized, its ordinary activities detailed, but all because this helps the researcher to pursue the external interest" (p. 437). The external interest in the present study was to provide faculty and administrators with student feedback necessary to make informed decisions to implement unchanged, implement with modification, or discontinue the use of VC technology in the nursing program studied (Hall et al., 1977).

Research Participants

Understanding student experiences of VC courses through case study proved significant in providing the information necessary to facilitate administrators in making an informed decision to implement unchanged, implement with modification, or reject the innovation for use at the college.

Number of participants. Flick (2007) stated that sampling a population for a qualitative study is not often based on random selection; rather it is based on "a collection of deliberately selected cases, materials or events for constructing a corpus of empirical examples for studying the phenomenon of interest in the most instructive way. Therefore, most suggestions for qualitative sampling are around a concept of purpose" (p. 27). In the present study, a nonprobability purposeful sample consisted of second semester undergraduate nursing students who participated in their requisite med-surge course. The college incorporated VC technology to connect two campuses of the college where the

researcher was granted permission to conduct the study. A representative number of participants for a qualitative case study should be an amount sufficient to gather enough interviews until no new insights are gained in subsequent interviews from which to draw inferences, note patterns, and record recurrent themes (Creswell, 2007; Miles & Huberman, 1994; Ryan & Bernard, 2000; Stake, 1995; Yin, 2009). Kvale and Brinkmann (2008) stated: "Interview as many subjects as necessary to find out what you need to know" (p. 113). Kvale (2007) stated: "In common interview studies, the amount of interviews tends to be around 15 ± 10" (p. 11). With each mounting interview, the datum were compared with previous interviews to ensure that the data corpus fully represented "the universe of events, actors, or settings being studied" (Miles & Huberman, 1994, p. 250).

The interviews continued throughout the semester at a rate of a few each week until the point of saturation was reached when no new information was gained from additional interviews. Kvale (2007) stated: "New interviews might be conducted until a point of saturation, where further interviews yield little new knowledge" (p. 44). This process was estimated to provide a range of from 10 to 20 personal interviews from the student participants of the VC courses. Additionally, students were invited to participate in focus groups—one from the main campus location and one from the regional campus location of the VC course. Each focus group comprised five students. Overall, the total of all interviews combined were 32. In Brinkmann (2013): "Interview studies tend to have around 15 participants, which is a number that makes possible a practical handling of the data (although, 15 interviews of 20 transcribed pages equals 300 pages to be analyzed, which is quite a bit)" (p. 59). Additionally, these semi-structured, in-depth personal

interviews lasted from 30 to 60 minutes each (Merton, Fiske, & Kendall, 1990; Yin, 2009).

Participant sample size tends to vary among qualitative studies. For example, two qualitative studies conducted of the Digital Dakota Network concerning the adoption of VC technology in the North Dakota public school system, comprised 11 and 9 interviews, respectively (Calderone, 2003; Hughes, 2009). A qualitative case study involving students in an after-school program concerning diffusion of innovation of computer technology comprised five students (Glogauer, 2007); and using a purposeful sampling technique, 10 aviation instructors were selected to participate in an instrumental case study concerning informal learning (Wofford et al., 2012). Additionally, a qualitative case study design concerning the diffusion of innovations technology in a corporate environment used a purposeful sampling technique to gather two separate groups of 25 each (Baxley, 2008). Another example of an instrumental case study is Lewthwaite et al. (2012), which involved only one individual for the study. A final example of an instrumental case study consisted of two literacy teachers comprising what was described as a multi-case study (Parsons, 2012).

There is agreement among authors that case studies typically involve a study comprising a few individuals or sites (Creswell, 2008; Fontana & Frey, 2000; Stake, 2000). According to Creswell (2008) “This is because the overall ability of a researcher to provide an in-depth picture diminishes with the addition of each new individual or site” (p. 217). Brinkmann (2013) stated that “fewer interviews that are thoroughly analyzed are preferable to many interviews that are only superficially explored” (p. 59). Additionally, using the investigative style of instrumental case study, this method

provided rich content. A demographic cross section are listed in Table 1.

Table 1

Demographic Cross-Section of Study Participants

Location	Sex	Age	Race	Prior education
Main campus Individual interviewees	Avg. 31	F = 9; M = 2	Cauc. = 5 Hisp. = 4 Black = 1 Other = 1	BS degree = 3 AS degree = 2 Certificate = 1 Licensure = 1 No degree = 4 Avg. cred. = 86
Focus group	Avg. 27	F = 3; M = 2	Cauc. = 2 Mixed = 2 Hisp. = 1	BS degree = 1 AS degree = 2 Certificate = 1 Military = 1 Avg. cred. = 92
Regional campus Individual interviewees	Avg. 30	F = 7; M = 4	Cauc. = 5 Black = 4 Hisp. = 1 Asian = 1	BS degree = 2 AS degree = 5 Licensure = 1 No degree = 3 Avg. cred. = 84
Focus group	Avg. 30	F = 5; M = 0	Cauc. = 5	BS degree = 3 AS degree = 2 Avg. cred. = 118
Total averages	Avg. 30	F = 24; M = 8	Asian = 1 Black = 5 Cauc. =17 Hisp. = 6 Mixed = 2 Other = 1	BS degree = 9 AS degree = 11 Certificate = 2 Licensure = 2 Military = 1 No degree = 7

Note. Based on self-disclosure in demographic questionnaire (see Appendix C).

Instrumentation

Observation. The researcher observed the class from the broadcast site and the receiving site of the VC course in equal amounts throughout the semester. This meant alternating between main campus and regional campus locations intermittently. Rogers (2003) recommended the use of gathering data at several points in a study to strengthen

diffusion of innovations research. Multiple data points draws on current information rather than reliance on memory of past events of participants. Notating researcher observations provided a corpus of additional information with which to triangulate data in the study.

Documents. Creswell (2012) stated that documents are a valuable source of information in qualitative and quantitative research. Documents used in the study consisted of EOC summaries provided by the college and a demographic questionnaire completed by students at the time of the interviews and focus groups; plus, an inventory list of VC equipment in use in the two classrooms in the present study.

Personal interviews. The primary instrument for the collection of data was semi-structured in-depth personal interviews. Yin (2009) stated: "One of the most important sources of case study information is the interview" (p. 106). Yin also stated that "interviews are an essential source of case study evidence" (p. 108). Considering this was a qualitative case study, interviewing the entire group of students, though desirable, was not necessary; therefore, a nonprobability purposeful representative sample was gathered (Creswell, 2008; Miles & Huberman, 1994; Yin, 2009). According to Creswell (2008), purposeful sampling is when "researchers intentionally select individuals and sites to learn or understand the central phenomenon" (p. 214). The purposeful sample comprised second semester nursing students located at the main campus of the college and to one of its regional campuses. Specific participants in the study were self-selected students who volunteered to participate in response to an invitation extended to all students within the course. The interviews were conducted face-to-face where possible (Wofford et al., 2012), with a consideration that some interviews out of convenience to the participants,

were conducted by telephone or by email when face-to-face was not possible (Balkin et al., 2005).

Qualitative research conducted by telephone has shown to be interchangeable with face-to-face interviewing, though there are trade-offs (e.g., optimal concerning expense, reach, and accessibility; detrimental, concerning lack of physical observability of interviewees). Research supports that face-to-face and telephone interviews are both valuable for qualitative data collection (Block & Erskine, 2012; Chang & Krosnick, 2009). Concerning the use of telephones: "Telephone interviewing is appropriate when ... questions are open-ended because subjects are not required to make complex delineations between responses where they are reliant on their memory" (Block & Erskine, 2012). The use of telephone and email in data collection was consistent with previous similar studies conducted of the Digital Dakota Network, for example (Bauck, 2002; Calderone, 2003; Hughes, 2009). Further, studies have shown that interviews by email do not confound the research, and in some cases provide opportunity to interview participants who may otherwise be excluded from a study due to constraints of time and location (James, 2007; Nguyen, 2007).

Focus groups. A primary reason for conducting focus group interviews in conjunction with individual interviews is to assist the participants in recall, which is one of the criticisms of diffusion of innovations research studies. Historical in nature, most diffusion of innovation studies are conducted after the adoption or implementation has occurred, thus leaving the researcher dependent on historical recall of the participants, "which may lead to inaccuracies" concerning actual past events (Rogers, 2003, p. 126). According to Fontana and Frey (2000), group interviews "often produce rich data that are

cumulative and elaborative; they can be stimulating for respondents, aiding recall" (p. 652). Additionally, Creswell (2008) stated that focus group interviews are an excellent way to "collect shared understanding from several individuals as well as to get views from specific people" (p. 226). Barbour (2007) stated: "Focus groups elicit data that are also different in content from that generated by one-to-one interviews" (p. 43). These reasons—to aid in recall, to collect shared understanding, and to elicit different data from participants—provided the rationale for using focus groups in addition to individual interviews. The group interviews from focus groups were not used as "'fallback' interviews" as Barbour (2007) warned against in replacement or in lieu of individual interviews (p. 42). Rather, these data were aggregated with individual interviews and documents; then triangulated for a more effective analysis of data for this case study. Focus groups were differentiated between main campus and regional campus locations.

Number of focus group participants. Two focus groups were formed—one comprising students from the main campus location of the VC course and the other comprising students from the regional campus location to capture possible varied perspectives. The regional campus focus group (RCFG) lasted 95 minutes, while the main campus focus group (MCFG) lasted 120 minutes. Each focus group was limited in size to a maximum of five participants. Creswell (2008) recommended the size of a focus group should be between four and six participants: "The researcher asks a small number of general questions and elicits responses from all individuals in the group" (p. 226). Bogdan and Biklen (1998) recommended 8 to 10 individuals. Barbour (2007) pointed out that it is not the breadth of the group, but the depth of the interviews that is of most concern and recommended that a group as small as three participants would be sufficient.

Authors agreed that focus group interviews may assist in encouraging participants to respond when otherwise there may be reluctance to share information; and, also aid in recall. Though authors agree that focus groups are a valuable consideration in qualitative research, focus groups are not without problems inherent in the method. When groups are too large or the interviewer is unable to keep pace with the action or discussion, there is a concern that information and observations may be lost. Therefore, smaller groups are more desirable in order to gain greater depth and understanding to triangulate with the individual interviews.

Individual interview questions. According to Rubin and Rubin (2012), when preparing for the interview phase, an extensive review of extant literature should result in the creation of an interview guide, or protocol, which translates the research questions into interview questions. An interview script was created to guide each interview. According to Stake (1995), the central research question guides the study with additional subquestions that follow the central question. The central research question for this study: *Is VC technology a viable option for nontraditional degree-seeking undergraduate students?* Creswell (2007) stated: "My understanding of issue-oriented subquestions is that they take the phenomenon in the central research questions and break it down into subtopics for examination" (p. 109). The subquestions were:

1. What are the student opinions of VC technology concerning undergraduate courses at a distance?

2. Do students perceive their academic experience to be greater or lesser depending on proximity to the instructor and/or distant students (in the classroom or at a distance)?

3. Would students participate in future VC courses if given the option?

These, subquestions were used to develop the protocol in which the interview script was created incorporating multiple questions based on the subquestions of the study.

Yin (2009) stated "Case study data collection does follow a formal protocol, but the specific information that may become relevant to a case study is not readily predictable" (p. 69). Yin continued: "If you are able to ask good questions throughout the data collection process, a good prediction is that you also will be mentally and emotionally exhausted at the end of each day" (p. 69). Yin further stated that "this depletion of analytic energy is far different from the experience in collecting experimental or survey data—that is, testing 'subjects' or administering questionnaires" (p. 70). Bearing this in mind, it was important to recognize that the interview questions were written to continually point back to the research questions, which were constructed to keep diffusion of innovations theory at the point of focus. Additionally, Yin pointed out that the role of researcher in a case study included being a good listener, remaining adaptive and flexible, maintaining a focus on the issues being studied, and avoiding bias.

Interview Protocol

Kvale (2007) discussed the next step after developing the research questions was to script the interview, which meant wording interview questions in such a way to guide the flow of the interview without leading or influencing the interviewees in their responses. Kvale stated that a guide may merely contain some topics to be covered, the research questions, for example: Or "it can be a detailed sequence of carefully worded questions. For the semi-structured type of interview discussed here, the guide will include an outline of topics to be covered, with suggested questions" (p. 57). Following were the

questions for the semi-structured in-depth, personal interviews. Concerning the time factor of interviews, Kvale (2007) stated "give the subjects ample freedom and time to unfold their own stories, and follow up with questions to shed light on the main episodes and characters in their narratives" (p. 57).

The series of interview questions were carefully constructed to engage each participant in a dialogue most conducive to creating content rich data for a thorough investigation and analysis of each research question around which each interview was conducted. According to Yin (2009) "Interviews are essential sources of case study information: The interviews will be guided conversations rather than structured queries" (p. 106). The interview questions were based on the following subquestions.

Research Subquestion 1: What are the student opinions of VC technology concerning undergraduate courses at a distance? The interview questions that pertained to Research Subquestion 1 were:

1. During the fall 2014 semester, you currently participate in a course facilitated through VC technology. What prompted you to enroll in the course? How did you feel initially about taking a VC course? When and how was it explained to you that you were going to be in a course through VC technology? Did or do you intend to complete the course? At the time of this interview what week are you in of the current term? How have your initial feelings about the course changed to this point in the semester?

2. Concerning the actual classroom environment: Have there been moments when technical or nontechnical issues affected the quality of the course, in your opinion? Can you describe what happened and how "it was" or "they were" resolved? How do you feel about the overall experience, so far?

Research Subquestion 2: Do students perceive their academic experience to be greater or lesser depending on proximity to the instructor and/or distant students (in the classroom or at a distance)? Research Subquestion 2 concerns academic experiences. The following questions were designed to answer Research Subquestion 2.

3. Students typically have certain learning expectations or expected outcomes when taking a class: What expectations did you have upon taking the course through VC technology? Were there any unexpected outcomes, positive or negative, that you feel were a result of participating in a VC course?

4. Are you located at the main campus or the regional campus in the VC course? Do you feel as though you are treated the same as students in the other classroom? If treated differently, in what way(s)? Do you feel that the physical distance from your teacher and/or from other students affect your learning experience in the course? If so, please elaborate why.

5. In alternating class sessions, the course broadcast from your location to the other campus, while in other class sessions your class was the receiving site for course instruction. How would you describe the differences between those class sessions? How would you describe the similarities between those sessions? Did you have any preference between being at the broadcast location or the receiving location? Please elaborate your responses.

Research Subquestion 3: Would students participate in future VC courses if given the option? Research Subquestion 3 focused on whether students would register for future courses where VC technology is used.

6. After participating in this course through VC technology, will you enroll in

other courses using VC technology? Please state why or why not.

7. If given the opportunity to design a course using VC technology, what would the course look like? In what ways would it be different than the current VC course in which you are enrolled?

Exit Question. Morrison, Gregory, and Thibodeau (2012) recommended that due to the relationship developed between the interviewer and interviewees during the course of intense, in-depth interviews, negotiated closure or exit strategy should be considered:

> Given what is potentially at stake for participants in qualitative research, there is a moral and ethical imperative to enter into the dialogue of closure. Otherwise, participants may unwittingly serve as a means to an end, that is, as objects in the enterprise of qualitative research. (p. 416)

In an effort to preserve the feelings and give opportunity for closure to each interviewee, a final question with closure dialogue was provided in which the interviewee was given opportunity to ask questions they had concerning the interview or any other issues that surfaced during the interview (Kvale & Brinkmann, 2008; Morrison et al., 2012). A final question for closure was:

8. In concluding the interview: Is there anything you would like to add or discuss that came to mind during our interview? Do you have any questions? According to Kvale and Brinkmann (2008), providing this final question at the end gave closure to the interviewee.

Focus group interview questions. As in the individual interview questions, the focus group interview script and questions were based on the research subquestions of the study. In the focus groups, a modification of the research subquestions initiated the discussion.

1. Individually and as a group, what were notable experiences in the course from

your first night in class and throughout the semester in which the course was facilitated through VC technology?

2. In what ways would you consider your academic experience better or less resulting from your physical nearness to, or distance from your course instructor and students at the other site?

3. Are you located at the main campus or the regional campus in the VC course? Do you feel as though you are treated the same as students in the other classroom? If treated differently, in what way(s)? Do you feel that the physical distance from your teacher and/or from other students affect your learning experience in the course(s)? If so, please elaborate why.

4. In alternating class sessions, the course broadcast from your location to the other campus, while in other class sessions your class was the receiving site for course instruction. How would you describe the differences between those class sessions? How would you describe the similarities between those sessions? Did you have any preference between being at the broadcast location or the receiving location? Please elaborate your responses.

5. If given the option to complete your nursing degree predominantly through VC courses, would you exercise that option? Please explain your answers.

6. Given, what you experienced throughout the course with VC technology: What would you recommend to improve, change, correct, or in other words, enhance your experience as a student participating in studies at a distance campus of the college?

This final question was very broad and designed to optimize the opportunity to hear from students suggestions based on their personal experiences as students

participating in studies at distance campuses and through the venue of VC technology.

Procedures for Conducting the Study

The following was the systematic procedure for conducting the study.

1. An administrative letter was submitted requesting permission to conduct research at the main campus and regional campus of the college where entry-level nursing degree-seeking students participated in courses through VC technology. Subsequent permission was granted for the researcher to observe, interview, and conduct focus groups during one semester of coursework.

2. During the first class, the researcher was introduced to the class and briefly described the intended study inviting students to participate in the personal interviews and focus groups on a voluntary basis at selected intervals during the semester. A reminder announcement was made the next immediate course times at each campus to prompt student participation for individual and focus group interviews.

3. Prior to each interview, a consent form was signed by all who volunteered to participate in the study. At that time, the list of interview questions (see Appendix A), and the list of focus group questions (see Appendix B) were provided to participants.

4. At the time of each interview, demographic information was gathered from each participant through a questionnaire (see Appendix C). A request was made to participants in an attempt to use a snowball sampling technique to invite final participants consisting of other students in the VC course (Creswell, 2007, 2012). The focus groups, one group of students from the main campus site and one group from the regional campus site, were voluntarily assembled by students who then signed up as a unit from each campus. These were conducted at times convenient and comfortable for each participant,

whether individual or as a group (Barbour, 2007; Creswell, 2007; Madriz, 2000).

5. Interview responses, whether in person or by phone were typed on a laptop on the interview sheets created for each personal interview (see Appendix D) and focus group (see Appendix E).

6. Immediately following each interview, the notes were reviewed and coded. This assisted in the process of comparative analysis of each interview on a continuous basis rather than compiling all interviews and waiting until all interviews were concluded prior to analysis (Creswell, 2007; Saldaña, 2013; Stake, 2000). In the event that a few of the personal interviews were conducted by email, follow up calls and in-person discussions were made to participants to further clarify responses (Kvale, 2007).

7. The focus group interview responses were typed on the interview sheets during the interview in order to capture statements that participants said during each focus group interview (Barbour, 2007; Creswell, 2007; see Appendix E). At the end of each focus group, the notes were coded and analyzed for recurring and emerging themes.

8. After each interview, including focus group interviews, the participants were asked permission for follow up contact in the event that clarification was needed concerning responses given during each interview (Kvale, 2007).

9. Thank you letters were hand-delivered to all in-person interviewees at the conclusion of interviews and those who interviewed by phone or email received them in person at the next immediate classroom observation.

10. Each participant received $25 cash incentive at the completion of each interview, whether individual or focus group, as a way of offsetting “interview burden” associated with qualitative interviews that often exceeded a one-hour baseline (Singer,

Van Hoewyk, Gebler, Raghunathan, & McGonagle, 1999, p. 218). Several authors were in agreement that cash incentives increase participation without impairing the quality of data obtained (Lee & Cheng, 2006; Ryu, Couper, & Marans, 2005; Singer et al., 1999). Additionally, the incentive amount was based on Singer et al. (1999) meta-analysis that showed an average of $11.84 in 1983, which when adjusted for inflation using a consumer price index tool to 2014 economy, averaged $28.27. Therefore, the $25.00 cash incentive amount per completed interview was considered a fair rate of exchange based on these findings.

11. The focus group interviews, personal interviews, documents, and personal observations were triangulated for more effective analysis and deeper understanding of the data (Saldaña, 2013; Stake, 2000). All information was analyzed and became part of the final report.

Data Analysis

Proper analysis and interpretation of the data was crucial to the successful completion of the research conducted. Creswell (2008) stated: "Qualitative reports typically contain extensive data collection to convey the complexity of the phenomenon or process. The data analysis reflects descriptions and themes as well as the interrelation of themes" (p. 58). These data initially were read to get a general sense of the data and then coded for description and theme (Creswell, 2008, p. 244; Miles & Huberman, 1994; Ryan & Bernard, 2000; Saldaña, 2013). Considered an iterative process, a continuous "cycling back and forth between data collection and analysis" was recommended in qualitative studies (Creswell, 2008, p. 245; Miles & Huberman, 1994; Yin, 2009). Additionally, in qualitative research, interpretation of the data meant bringing a particular

perspective to the interpretation based on experiences and insights of the researcher (Miles & Huberman, 1994; Silverman, 2000; Yin, 2009). Therefore, it was important to take every step possible to eliminate any bias the researcher brought to the study. For example, one criticism in diffusion of innovations research is pro-innovation bias, "the implication in diffusion research that an innovation should be diffused and adopted by all members of a social system" (Rogers, 2003, p. 106). Every effort was made to ensure accuracy, authenticity, and ethical standards in collecting, archiving, analyzing, coding, and reporting the findings from the interviews. Many authors agree that triangulation of data assists in eliminating bias; therefore, this method was used in the analysis of data (Bogdan & Biklen, 1998; Stake, 1995; Yin, 2009).

Concerning analysis of collected data, Creswell and Plano Clark (2011) stated: "Qualitative validity comes from the analysis procedures of the researcher, based on information gleaned while visiting with participants" (p. 211). Some steps in the qualitative analysis also recommended were:

> (1) preliminary exploration of the data by reading through the transcripts and writing memos; (2) coding the data by segmenting and labeling the text; (3) verifying the codes through inter-coder agreement check; (4) using codes to develop themes by aggregating similar codes together; (5) connecting and interrelating themes; (6) constructing a case study narrative composed of descriptions and themes; and (7) cross-case thematic analysis. (Creswell & Plano-Clark, 2011, pp. 308–309)

These steps served as a guide and were used in the collection and triangulation of observations, personal interviews, focus groups, and EOC summaries gathered during the course of data collection; and, continuously analyzed for findings. Di Gregorio and Davidson (2009) referred to this process as "*disaggregating data* and *contextualizing data*" (p. 21).

Triangulation

Triangulation was used to combine the multiple sources of data into one cohesive analysis, in order to identify constructs, patterns, and themes. Stake (2000) wrote: "Triangulation has been generally considered a process of using multiple perceptions to clarify meaning, verifying the repeatability of an observation or interpretation" (p. 443). Triangulation was used to combine qualitative data from observations, personal interviews, focus groups, and EOC summaries. Gibbs (2007) stated: "By getting more than one different view on a subject, an accurate (more accurate) view of the subject matter can be obtained" (p. 176). Through the analysis of multiple data sources, constructs, patterns, and themes emerged. These were compared continuously against the central research question: Is VC technology a viable course delivery option for nontraditional degree-seeking undergraduate students?

Chapter Summary

This chapter covered the aim of the study, the participants, the research approach, and the data collection methods used. Additionally, discussed were analysis of the data through triangulation of observations, personal interviews, focus group interviews, and EOC summaries. By developing an interview protocol, a scripted approach to interviews was incorporated based on the central research question and subquestions of the study. Procedural steps were enumerated to clarify the process by which the interviews and focus groups were conducted, analyzed, and reported.

Chapter 4: Results

This study attempted to answer the research question: Is VC technology a viable course delivery option for nontraditional degree-seeking undergraduate students? Interview protocol consisted of eight questions based on the research subquestions and six questions for each focus group as detailed in the previous chapter. Responses to the interview questions varied between those who accepted VC technology as is with no changes; those who accepted VC technology but with recommended changes; and those who rejected VC technology for use in undergraduate studies.

Interviews

A pattern formed concerning interview preferences between the two campuses. Regional campus students chose telephone first, email second, and in-person third. Main campus students chose in-person first, telephone second, and email third (see Table 2).

Table 2

Personal Interview Patterns

Interview options	Regional campus	Main campus	Avg. interview time
In-person	2	6	61.25
Telephone	6	4	65.55
Email	3	1	53.17
Totals	11	11	59.99

In-person interviews. In-person interviews were the primary option chosen by main campus students. Main campus interviewees tended to have open time prior to or immediately following class as a convenience that could be scheduled around class, lab, and group project times. Additionally, due to shorter commute times, main campus students were more flexible regarding the availability of time.

Regional campus students, however, due to longer commute times and less flexibility regarding lab times, were much less likely to choose the in-person interview as an option; selecting telephone and email respectively as options over that of in-person interviews. Regarding the two regional campus interviews, the researcher scheduled sessions for classroom observations in the regional campus classroom and remained after for the pre-scheduled interviews. The in-person interviews were conducted inside the classroom where the VC course was facilitated. On their respective days, interviewees remained in their regularly seated locations, and the interviewer sat across the table from each of them. Interviewing in the VC classroom was for the purpose of assisting students in recall and in ease of responding during the interview in the familiarity of the surroundings. For example, each respective student was asked how they would design similarly or differently, a course using VC technology. Interviewees paused, then looked around at the classroom from the perspective where they sat in the class and were able to more freely recall problem areas from their experiences and make recommendations without much hesitation.

Main campus students preferred in-person interviews, followed by telephone, then email. Those who interviewed in-person were equally split between students meeting early morning on class days and immediately following class time. For the main campus interviews, the researcher scheduled sessions on the main campus for classroom observations on those dates as a matter of convenience as well as being able to dialogue more concerning the recent class to assist in recall for the students. Unlike the regional campus interviews, the main campus interviewees, with one exception, did not have the option to sit in the classroom. Rather, the meeting had to occur in other rooms on the

main campus as that classroom could not be secured for private interviews; the main campus classroom was in use during the scheduled interview times. Main campus students primarily met in a secure conference room or in an auxiliary office for privacy.

Telephone interviews. The majority of regional campus students chose to interview by telephone and gave time management as the primary reason for choosing the option. Regional campus students averaged a one-way commute drive time of approximately one hour. Drive-time interviews proved an efficient use of time. The interviews conducted by phone were routinely prefaced with the question of whether the students were driving or riding as passengers at the time of each interview. All students who interviewed during commute time self-reported as passengers, which allowed them to focus on the interview questions rather than traffic. The telephone interviews not conducted during commute time were on Friday evening or Saturday afternoon when students were stationary in the comfort of their home surroundings.

Main campus students chose telephone interviews as a second option. Those who interviewed by telephone were split between sitting in their cars while on the main campus parking lot between class and lab times; or, while on break from other on-campus activities during the week. Each had chosen to sit in their cars as a natural selection for a place of solitude where they would not be interrupted.

Email interviews. The email option for interviews was the second choice among regional campus interviewees; whereas, it was the last option chosen by main campus students. This option had been anticipated by the researcher as the first option for all students. It was a surprise that it was the least chosen by main campus and the second chosen by regional campus students. Regional campus students stated they had treated

the email interview as just another assignment; whereas, the one main campus student who selected it considered it as "more efficient to get the questions and then type in the answers and return the email" (Personal communication, MC 1, Week 1; RC 3, Week 2). Noteworthy, was that the first student to volunteer for the interviews was the first student to approach the researcher on Day 1 of the study prior to the start of class. She had been inquisitive and approached making sure the researcher was in the right class and engaged the researcher in conversation regarding the study. She also stated that she "loves technology and would be glad to participate." Regarding all email interviews, follow ups were conducted in-person initially to clarify some statements and then later as prompted by interviewees who wanted to add to original interview responses. Follow up time amounted to approximately 15 minutes in addition to the time listed in Table 2.

In all cases of interviews, the interview was explained and described as an ongoing dialogue that would continue through the entire semester. This left the interviewees with the availability to approach the researcher at any time for further comment or discussion as prompted by new experiences or occurrences in class. One such example was the interview question regarding student preferences for being at the broadcast site or receiving site. Many of the interviews were conducted prior to students experiencing both sides of the VC course. At the time of each interview, the researcher explained that at some point during the term they would experience the other perspective. All interviewees agreed that they would give their perspective after such an occurrence. Each interviewee was then able to respond to that particular question later in the semester. The estimated time of 15 minutes proved accurate in the compilation of follow up periods during informal discussions on class breaks or through emails and text

messages throughout the balance of the semester. Students were open and responsive to the researcher on breaks and through texts and emails after the initial interview with each participant.

Additionally, responses between the main campus and the regional campus offered differing perspectives due to program design requiring each of the five program instructors to teach an equal amount of time during the semester. The main campus was most often the broadcast site, and the regional campus was typically the receiving site because four of the five instructors broadcast from the main campus and one instructor broadcast from the regional campus. As such, interviewees from the main campus were signified with an MC followed by consecutive numbers 1–11 to designate each of the 11 main campus interviewees. Regional campus interviewees were also numbered 1–11 and designated with an RC preceding each interviewee number. The selected responses for each of the interview questions were summaries of transcripts when interviewees responded similarly enough to generalize. However, interview analysis relied heavily on in vivo coding; therefore, direct quotes were used when possible to signify the distinction in answers between the two campuses and individual interviewees.

Interview Question 1. During the Fall 2014 semester, you participated in a course facilitated through VC technology. What prompted you to enroll in the course? How did you feel initially about taking a VC course? Did or do you intend to complete the course? At the time of this interview what week are you in of the current term? How have your initial feelings about the course changed to this point in the semester?

Registration for this particular nursing course was mandatory as it was part of the requisite coursework for the nursing program at the college studied. The most common

response to this question was: “I think when I signed up for the course it said web-enhanced video conference. I didn’t know what that meant when I signed up. I found out the first day” (MC 10, Week 8). All students stated their full intention to complete the required course. Interviews took place over a span of 14 weeks of the 16 week semester beginning end of Week 1 and concluding in Week 15. In keeping with Rogers (2003) who recommended that the study be conducted over time, the subquestion of how initial feelings changed during the course of the semester was included. Interviewees typically responded that initial feelings changed very little throughout the course. Main campus common responses from interviewees who accepted VC unchanged responded: “I am ok taking the course and having it change at this point in the semester wouldn’t change a thing on my education” (MC 1, Week 1); and “No change with the VC class, I am very happy with it still” (MC 5, Week 5). The only regional campus student to accept VC unchanged responded “In the beginning I didn’t like it at all. Now I’m used to it. I was more used to the instructor in the class” (RC 11, Week 14).

Interviewees from the main campus whose decisions were to accept VC technology with changes responded “I thought that I was going to hate it, but now I just don’t like it. I thought it was going to be worse than it is, but it’s still not that good” (MC 7, Week 5). Regional campus students responded with: “I am not very enthusiastic about it due to it being hard to hear people speaking” (RC 3, Week 2); “I have adapted to it; maybe if it was better it would be ok” (RC 8, Week 11). There were no interviewees from the main campus who rejected VC technology. Regional campus interviewees who rejected VC responded with “The professors on the other side now know how to properly use the equipment better to switch the screen we are seeing on our side” (RC 6, Week 7);

and “They are fidgeting with it but we could have saved time and been separate classes.... Microphones are just too sensitive” (RC 10, Week 12). Based on the responses of the interviewees, students participating in this course were initially introduced to VC technology for the first time; therefore, according to Rogers (2003) students would have entered the knowledge stage of the five stages of the innovation decision process.

Interview Question 2. Concerning the actual classroom environment: Have there been moments when technical or nontechnical issues affected the quality of the course, in your opinion? Can you describe what happened and how “it was” or “they were” resolved? How do you feel about the overall experience?

Students experienced technical issues from the onset of the course. Interviewees from the regional campus made statements concerning the technical issues with equipment such as “I don’t even bother looking at the picture because it’s blurry and fuzzy” (RC 1, Week 1); “Yes, when the smallest noise is made it cuts out the microphone on the other end and I lose, what could potentially be, important words or phrases” (RC 3, Week 2); and “At first the technology bothered me, but now it doesn’t bother me. I think I adjusted to it and now I don’t notice it. I have learned to adjust to things quickly” (RC 11, Week 14).

Main campus students responded somewhat the same: “Only in the beginning of each class, when there is a problem with the instructor turning on the screens, it gets delayed but everything has gotten better as the weeks go by” (MC 3, Week 4); “Sometimes in the beginning of the class when they go to link the class together, there is some kind of tech issue where sound or video doesn’t play and they want to get started” (MC 5, Week 5); “It has gotten better, the first couple of weeks were very frustrating.

Recently the last two weeks have been almost without issues" (MC 6, Week 5). "The thing I really don't care for is that we can't see the other group" (MC 8, Week 7). "I don't think it has interfered with my learning, it is slightly disruptive when there are technical issues, but once figured out it was ok" (MC 10, Week 8).

Nontechnical issues were reflected upon predominantly concerning faculty use of the technology. Regional campus interviewees made statements such as, "For example, the professors on the other side would not exactly know how to switch the computer screen on our side so we could view the same information as they were on the projector screen (RC 6, Week 7). Main campus students made statements such as "Overall experience is great. No complaints" (MC 1, Week 1); "When we come back from break, both sides are muted and we have to wave at each other to get the attention and then unmute" (MC 7, Week 5); and, "Just when they try to do something else or change or switch, that is when it becomes difficult for them to move on … did they teach [faculty] how to do this technology?" (MC 11, Week 8).

Interview Question 3. Students typically have certain learning expectations or expected outcomes when taking a class: What expectations did you have upon taking the course through VC technology? Were there any unexpected outcomes, positive or negative, that you feel were a result of participating in a VC course?

Common responses from main campus students included: "My expectation is to learn what I have to learn to pass my final exam and my nursing board exam; technical issues become small and not a big issue. What we get from the course is much more relevant" (MC 1, Week 1). Concerning the actual technology: "I think it defeats the purpose of the VC if you aren't able to see the other people. Tech issues, maybe the

hearing on both sides, and the microphones, either they can't hear us or we can't hear them" (MC 2, Week 2); "Technology was frustrating at the beginning but ok now"; and "It was nice today, I enjoyed it. The [regional campus] piped in and asked questions. We worked together today, which is something we haven't done before" (MC4, Week 4); "When I'm listening to the lecture, I can hear people in [regional campus] shuffling papers or talking. I am trying to focus in on the lecture and I can hear it overhead through speakers and that is disruptive" (MC 10, Week 8). "Outcome positive and negative, it's a new experience…. [Faculty] are doing nothing definitely wrong, but the minor things … It bothered me the one day we had to be receiving site ... I didn't assimilate much of that day" (MC 11, Week 8).

Continuing the comparison between main campus and regional campus responses, there was a shift in focus from the technology to the users of the technology—faculty: "Generally, having VC will probably allow a better group of speakers and different teaching styles. In other words, having a high caliber teacher presenting to a larger audience may be better than a regular instructor with a smaller group" (RC 1, Week 1); "I was going for an A, but now I feel lucky if I get a B. I think my grade is going to drop because my inability to connect with the teachers" (RC 2, Week 1); "VC is such a distraction I can't generally pick up what I need to … I feel bad for my professor because she is more accustomed to hands on and less techie. Tech frustrates her and puts her out of place" (RC 4, Week 2).

As the semester progressed, more comments included faculty use of the technology as a growing concern and source of attitude formation signaling the transition from Rogers (2003) first stage to the second stage in the innovation decision process, or

from the knowledge stage to the persuasion stage:

> My expectations for the course were not positive at first, because I was not very open to the idea of this type of technology. Now, I am starting to like the course a bit more now that some issues and problems have been resolved. I have to say that now; I am having more of an issue with the teaching format of the professors, than the use of VC technology itself. (RC 6, Week 7)

By Week 11 in the semester, interview comments focused more on frustration concerning VC equipment and faculty resistance to fully utilizing the technology: "Yes. Because it's not quality technology and the professors don't know how to work the equipment. It gets you frustrated right at the beginning and you don't even want to participate" (RC 8, Week 11). When asked to elaborate regarding the response, interviewee RC 8 stated: "They can't see us; so, we yell and talk out of turn and we can't see them or they us and we don't have a choice but to blurt out when we have questions" (RC 8, Week 11).

Other students were less apt to blame technology or faculty and remained focused on themselves: "I don't know if VC affected my expectations. I would say it really didn't"…"I expect an A and will do everything I can to get it. Teleconferencing has nothing to do with that" (RC 9, Week 11). In speaking about the equipment and instructors: "There is a lot of time wasted when they are figuring out how this equipment works. The way they present using it and the way they are not prepared" (RC 9, Week 11); and "VC doesn't matter one way or the other. I am responsible for passing the class" (RC 10, Week 12). Intuitively the researcher had a tendency to believe indifference signaled acceptance decisions; however, Rogers (2003) stated that indifference is more a sign of passive rejection of the innovation signifying progression through to the decision stage in the innovation decision stages.

Interview Question 4. Are you located at the main campus or the regional campus in the VC course? Do you feel as though you are treated the same as students in the other classroom? If treated differently, in what way(s)? Do you feel that the physical separation from your teacher and/or from other students affect your learning experience in the course(s)? If so, please elaborate why.

Main campus students tended to agree there was no difference in treatment and that physical separation from their instructor had no effect on their learning experience: "Yes, we are treated the same. No, the separation gives two classes the same opportunity and it contains the noise from having 100 students in the same room" (MC 1, Week 1); "I don't know much of the bias, but know the instructors can hear the [regional campus] voices and know them by name…. My separation from students doesn't affect my learning" (MC 3, Week 4); and "I don't think we are separated, they don't distinguish between [regional campus and main campus]. Most instructors come across as if they actually know the students from [regional campus]. They know their names and actually call out their names" (MC 11, Week 8).

Regional campus responses were more conditional. With four of the five instructors broadcasting the course from the main campus and one broadcasting from the regional campus, the regional campus interviewees had a differing perspective regarding some of their answers: "Yes, I do feel treated the same. There is equal time given between the campuses—as long as the professor can see us" (RC 1, Week 1). Adversely, other regional campus students had a different experience: "I do not feel we have the same opportunity to ask questions as the students on the main campus. I do feel that the physical separation from the teacher affects my learning because the teacher doesn't have

the opportunity to help one-on-one" (RC 3, Week 2); "I'm a hands-on student. It's hard to interact with VC" (RC 4, Week 2). By Week 11, students expressed a slight difference in opinion: "It just feels like one big group…. We still have an instructor on our campus every day in our room even though someone else is teaching on a particular day" (RC7, Week 11) and "Yes, differently, I think. For instance, recently they decided to have an after class lab. By us being in [regional campus] how the class is set up we are not able to participate in that extra class" (RC 8, Week 11). Although many interview responses were critical of instructor resistance to use the technology to the full extent, this was an example that over time, some instructors found alternate uses for VC technology. This signified a progression by some instructors from the decision stage to the fourth stage in the innovation decision process—implementation stage. According to Rogers (2003) all stages prior to the implementation stage are "a strictly mental exercise of thinking and deciding. But implementation involves overt behavior change as the new idea is actually put into practice" (p. 179).

Interview Question 5. In alternating class sessions, the course broadcast from your location to the other campus, while in other class sessions your class was the receiving site for course instruction. How would you describe the differences between those class sessions? How would you describe the similarities between those sessions? Did you have any preference between being at the broadcast location or the receiving location? Please elaborate your responses.

During this course, main campus was the broadcast site 80% of the time. This was due to equal responsibility given to each of the five instructors who taught this course, with four of the five instructors residing on the main campus and one on the regional

campus. That also meant that the regional campus was the receiving site 80% of the time. This provided a somewhat unique feature in that all interviewees could speak to differences based on personal experience between sites. However, it was not until several weeks in the semester before the first broadcast came from the regional campus. Many of the early interviewees did respond later as agreed. Their statements were notably different in perspective. One main campus interviewee made the later response after experiencing the class as the receiving site:

> The difference was huge! It didn't feel real, maybe it is because we are not used to it. Maybe next time the professor can make the lecture more interesting. And the audio needs to be adjusted so we do not feel so far away. And I enjoy being the broadcast location, it keeps me more attentive to do my work, it keeps me focused. (MC1, Week 1, follow up responses after Week 5)

Another main campus interviewee responded similarly: "The teacher from the other campus had prepared a lecture, however, it was difficult to hear what she was saying. Overall I think being on the receiving end was not as effective as being in the broadcast classroom" (MC 6, Week 5).

One notable difference mentioned in interviews when the regional campus was the broadcast site: Due to lack of adequate equipment based on researcher observations, the camera that would have been used to focus on the instructor was inoperative and therefore the regional campus broadcasts did not include on screen video of the instructor. Main campus students remarked: "I hope it doesn't continue with no sight and audio only. Audio comes in and out up and down, but it seemed to waver not doing me any good" (MC 8, Week 7) and "Of course, I would rather be at the site where my teacher is physically in front of me. I definitely like it better" (MC 11, Week 8). With the exception of one student, all students preferred to be at the broadcast location. The one

student who did prefer it stated: “Receiving is easier, you don’t have to look at any cameras; you just sit back and listen” (MC 9, Week 7). Noteworthy was that with the one exception, student preference for being located at the broadcast site was related to student-instructor interaction that was typically restricted when located at the receiving site. Regional campus responses to Interview Question 5 included:

> With the course broadcast being from my location, I enjoyed it. It felt like I was in a regular classroom setting, with mild background noise and the student’s voices when questions were being answered from the receiving site. I could pay more attention to the professor’s lecture, and not feel uncomfortable asking questions or making comments. Because of this, I prefer being the broadcasting location. The similarities would be that I could still not hear the other students from the receiving site comments well. They were muffled because they were not near the microphone, so I would have to strain at times to listen to them. (RC 6, Week 7)

Regarding physical nearness to the instructor: “It feels more connected to the material; I paid attention more when we broadcast…. It did feel more connected with her standing live in front of us” (RC 9, Week 11). Additionally: “The only problem is sometimes I may have a question and can’t get an answer right away. Sometimes I don’t ask a question because the instructor is at the other site” (RC 11, Week 14).

Interview Question 6. After participating in this course through VC technology, will you enroll in other courses using VC technology? Please state why or why not.

Main campus students were more likely to respond favorably to VC technology if it were offered as an option: “Yes, I would enroll again in this new technology type of class. I think it is the way of the future … and I guess in the future would be one professor for more than one class” (MC 1, Week 1); “Yes, based on what I know right now. The majority is live class for me” (MC 3, Week 4); “Yes, I would probably prefer it if I knew about it beforehand” (MC 5, Week 5); “Yeah I think I would because it doesn’t affect me in a negative way, it wouldn’t deter me from taking a course. It is me being

indifferent about it. I see the benefits of it" (MC 6, Week 5).

However, after several class periods where the main campus was the receiving site, there was a shift in opinions over time: "When it's like it is now, it is detrimental to the class" (MC 7, Week 5); "If given a choice, probably not; only because the benefit has to outweigh the negative …. If it's not run right, I would do better to do it in just real time" (MC 8, Week 7); and "Based on most classes face-to-face, I would take it" (MC 11, Week 8).

From a predominantly receiving site perspective, regional campus responses included:

> I will not participate in another course with VC technology. I prefer the regular class room setting with a live professor in front of me. Asking questions and making comments is easier, and the one on one interaction with the teacher is better for me. Information that is being lectured is not muffled, or hard to hear. (RC 6, Week 11)

One student ranked their personal choices: "If given the option, I would rather go online first, face-to-face second, and VC third" (RC 7, Week 11). Other students were conditional in their responses: "If given the option, not if it's set up like this. I am not opposed to VC technology, but not if it is set up the way this is designed" (RC 8, Week 11); and

> It would depend. I would do more research knowing what I know now. Are they skilled at it? Do they know what they are doing? Are they professional? If it was anything like what we have now, I wouldn't go near it. But I can see how if it is done right, it could be a real success. (RC 9, Week 11)

Over time, students shifted as faculty showed more facility with VC technology:

> I think I will, going the way it is going like it is right now. I would. I like the small class now, but if I am able to communicate with the other class, we can get the extra information. I like the settings now, I would. Like it was before, I wouldn't. (RC 11, Week 14)

Rogers (2003) stated that "as a result of reinvention, an innovation may be more appropriate in matching an adopter's preexisting problems and more responsive to new problems that arise during the innovation-decision process" (p. 185).

Interview Question 7. If given the opportunity to design a course using VC technology, what would the course look like? In what ways would it be different than the current VC course in which you are enrolled?

This question provided opportunity for all interviewees, whether they accepted the technology as is, accepted VC with modifications, or if they rejected VC altogether, to get involved in what Rogers (2003) referred to as reinvention. Early researchers ignored this aspect in early diffusion studies; however, it was so common that researchers began to include this as part of their research. Results from a national survey of innovation in public schools revealed that when an educational innovation was reinvented by a school, its adoption was more likely to be continued (Berman & Pauly, 1975). The following in vivo quotes encapsulated modifications discussed in the interviews:

> If we have to interact with another campus, I would want more and larger monitors. Strictly monitors, not on the projection screen it's not very clear. Hopefully make sure all the tech difficulties are taken care of before school starts. I guess you would have to have some feedback between sites. Like a mock classroom setting to anticipate any possible tech difficulties, provide instructor teaching on how to work with and troubleshoot monitors, because tech problems are time consuming. A video tutorial, something mandatory before the class starts. (MC 3, Week 4)

Many of the student interviews included added equipment for each campus:

> I don't like the fact that the [regional campus] screen is so small that you can't really see them. You should at least get to see the students. I can't see who they are or what they look like. I would have a better screen to see what they look like. I would get better sound. Get it working better so students didn't feel they have to sit motionless or quiet; It's important to get students involved in learning, I like being able to collaborate with peers and teachers, but I think the present setup is not ideal. (MC 6, Week 5)

Faculty training was a common element among main campus interviews as well:

MC 7, Week 5: "If everyone knew how the tech worked and they could flip a switch quickly without trouble; that would work well…. Three areas: material, presentation, and tech training." One interview excerpt encapsulated many main campus student opinions:

> How would I do it? I like the idea of VC technology. I think it could be an amazing feature; like bringing in guest speakers, etc. We need to see the other class; not just hear them. If there were screens that could show a close up, not just a picture from a security camera angle from the corner …. If I can see them talking, I am more engaged. If I can see them, I feel personally connected. I think more screens so everyone can see everyone. You know, someone in the other class raising their hand, we could see them raise their hand. Now we can't see. Truly when they ask questions we could see them right along with us. It would integrate it more; it would feel more cohesive and conducive. The camera now in [regional campus] looks like a security cam view. And we can't see faces. Maybe if the camera was eye-level, lower, where it is at an angle what you would see if you were looking at people in the other class. If you can't see people and make out boy from girl there is no point. I have had no experience with online or VC courses, but I would do this …. You just couldn't do it the way it is set up now. This is merely incomplete. (MC 8, Week 7)

> Regional campus students had much to offer in recommendations, as well:

> I would make sure the cams were such that you would be able to see the other classroom at all times. The way it is now, it is one or the other class. It would feel more like we were all in the same classroom if we had constant view for the benefit of both groups…. (RC 7, Week 11)

Many student interviews reflected similar responses after experiencing VC technology:

> Better equipment…that is more interactive like a true virtual classroom where all feel as if they are in the same room. Now you don't feel as if we are in the same classroom. Like the camera in [main campus], you just kind of see the outline of people. (RC 9, Week 11)

Multiple interview responses included faculty training and student orientation:

> I never think about that, basically with the class like this, I think the most important thing to explain to the student is how it is going to work…. I would spend time talking to students first to get them ready. I think also, training for the instructors so they know what to do…. Orientation at the beginning would help. I feel like I lost the first half of the semester because this is strange to me and no

training or orientation was provided. (RC 11, Week 14)

Interview Question 8. In concluding the interview: Is there anything you would like to add or discuss that came to mind during our interview? Do you have any questions?

Main campus interviewees had a few comments that came to mind by the end of the interview: "Maybe the IT should install and teach the staff how to manage the equipment. Also teach the students how to use and speak in the microphone" (MC 1, Week 1); "I think that interaction between the people is what VC is about. I enjoyed it when at [a previous university] because the quality of the technology. I have gotten used to this at [the current college] after three sessions" (MC 2, Week 2)

When given the opportunity for closure as recommended by Rubin and Rubin (2012), several students offered comments to recap the interview and to find emotional closure; many students appeared to have emotional experiences when recalling information during the interviews:

> You asked had I known it was VC before. If it had been in the registration form, I wouldn't have known it anyway. If there had been some kind of information where I could click in to see an example or a video of what it was going to be, I would have definitely chose it, but if not I just make the choice based on the available time for the class. (MC 5, Week 5)

> My main concerns are "[Regional campus] can you hear me?" stoppage and interruptions. It's concentration time, not physical time, but that we are completely sidetracked for a moment and it's not constructive. Could be a lot smoother. Accept with modifications; yes to technology. (MC 7, Week 5)

A few remaining statements were made by regional campus students when asked the closing question: "I think I have expressed all my feelings, but if something comes up, I will let you know when you are on our campus" (RC 4, Week 2).

Finally:

> I'm probably most irritated about the VC programming because the instructors seem like they don't want to learn how use VC. It's like they don't have interest in learning how to use the technology. I've thought about this; they don't know how to operate the equipment that is in their classroom. (RC 9, Week 11)

This final statement was an indicator that instructors, charged with using the technology to facilitate the course, were not in agreement with the mandated decision to adopt VC technology in the program. This was an example of what Rogers (2003) termed passive rejection of the innovation. Passive rejection as well as system blame will be discussed in the next chapter.

Focus Group Interview Questions

Main campus focus group (MCFG) and the regional campus focus group (RCFG) had many parallel experiences to share. Multiple quotes combined for a consensus of opinion in each group throughout the interview in general. However, when members had individual points of view, those were included in the in vivo quotes.

Focus Group Question 1. Individually and as a group, what were notable experiences in the course from your first day in class and throughout the semester in which the course was facilitated through VC technology?

Concerning the actual equipment:

> It's very loud. You can pick up things from the other end you shouldn't hear, like pages turning, or sometimes under the breath statements because the sensitivity of the microphone. When we are on the receiving end, we feel disconnected… Also when the other site is talking, we can't really hear individual statements when all answer together. (MCFG Interviewee 1)

Concerning Faculty training: "If they haven't learned it, there seems to be no incentive to learn it. There needs to be a change. Are they self- taught?" (MCFG Interviewee 1); "I say it is user error that is causing this problem with the technology. Now that we are at the end of the term, they seem to be making it work now" (MCFG Interviewee 2);

"Training should be done before the semester begins …. We wasted a lot of class time waiting for technical issues and distractions while professors were trying to get the technology working" (MCFG Interviewee 3); and "Now at the end of the semester, they seem like they know more about what they can do" (MCFG Interviewee 4).

A main campus focus group response concerning equipment was agreed by all:

> We need dual screens, large so we students can see them and on their side so they can see us all while the PowerPoint is on display. This is not conducive to anybody by not seeing the PowerPoint slide and the other students at the same time. (MCFG Interviewee 4)

The regional campus focus group responded to Focus Group Question 1 in similar manner. Concerning opinions expressed about need for faculty and student training: "It is also different if the professor is up front by the microphone, it is clear. But if the professor in the back of the room is talking and something makes noise it cancels out the microphone" (RCFG Interviewee 1); "At the beginning they wasted so much time. About 15 minutes, now we still start almost at 9:40 a.m. every day: "What do you see now? Can you see that?" (RCFG Interviewee 1); "I think user malfunction is a problem" (RCFG Interviewee 2); "We also don't know where we are supposed to stand when we present. We don't know what we are supposed to do or where to look. Training should be helpful" (RCFG Interviewee 4); "If the instructors went through all the training, they would know what to do and where to place us" (RCFG Interviewee 5).

The idea of communication protocol between sites was discussed:

> There has to be some sort of way to communicate better using the system. Let's say if the other site raises their hand we can't see them. They will have to scream over the top of the instructor. There should be something like a protocol to go by. (RCFG Interviewee 2)

Concerning opinions expressed about VC equipment: "I think the picture quality

is better and hearing voices is much better now than in the beginning. At the first it was "[Regional campus} stop shuffling paper" (RCFG Interviewee 3); "I think the sound is getting better but still needs improvement" (RCFG Interviewee 5); "When we are the receiving site: if we can't understand, we can't ask for clarification. And some students are shy so they don't talk at all" (RCFG Interviewee 5).

A final comment concerning student interaction: "It is nice to kind of expand our class in a way, because we are limited to 22 students, but now enlarged with a larger group. We are part of them—the whole group" (RCFG Interviewee 2).

Focus Group Question 2. In what ways would you consider your academic experience better or less resulting from your physical nearness to, or distance from your course instructor and students at the other site?

> Concerning interaction with students from the other site:
>
> It's nice when we present up front of our room and we can then see them through that one monitor to the other class. When we are in our seats, we can't see that monitor or students in the other class. (MCFG Interviewee 1)
>
> Concerning faculty interaction with technology:
>
> I want to see the other students, and distant instructor. They need to be able to zoom in so we can see them. We have the technology to make things awesome. You have the technology of watching somebody halfway across the world in real time, and now you walk into a class and sit and watch instructors not use the technology. (MCFG Interviewee 1)
>
> Concerning student interaction with faculty from the other site:
>
> Honestly, I dread when the VC is being broadcast from the other site, I am a visual learner and I can't see the other instructor. We can't ask questions when we need to of the instructor at the other site. She can't see us. When we do see them, I think it is a little better, not just a disembodied voice. (MCFG Interviewee 3)

Students expressed the importance of seeing faculty, students, and information simultaneously during VC classes: "We have never seen the other instructor. We have

never seen her face. We tune her out after a while. I like the dual screen to see the other students and the information as well" (MCFG Interviewee 5).

Regional campus focus statements included: "We can't see what people are saying on our screen, so it is difficult to understand" (RCFG Interviewee 1); and "I don't think it hurts my grades but definitely doesn't enhance them" (RCFG Interviewee 2).

Focus Group Question 3. Are you located at the main campus or the regional campus in the VC course? Do you feel as though you are treated the same as students in the other classroom? If treated differently, in what way(s)? Do you feel that the physical distance from your teacher and/or from other students affect your learning experience in the course(s)? If so, please elaborate why.

Main campus focus group opinions were: "We don't get the separation feel. However, we are expected to participate because the satellite students are basically sitting and watching us in class" (MCFG Interviewee 1); "Distance doesn't make a huge difference. It's like a classroom next door, it's what is being passed. But from the distance, no difference" (MCFG Interviewee 4). One example was provided suggesting there was a difference; by ignoring a technology issue: "It took a whole semester to just turn the volume down to lower the sound on the other class" (MCFG Interviewee 3.

Regional campus responses cited a similar technology example: "We can't even make a sound in our class or we get called down. It is user malfunction from other class" (RCFG Interviewee 4); and a final statement referenced lack of consistency between instructors: "I think everything needs to be more organized" (RCFG Interviewee 1).

Focus Group Question 4. In alternating class sessions, the course broadcast from

your location to the other campus, while in other class sessions your class was the receiving site for course instruction. How would you describe the differences between those class sessions? How would you describe the similarities between those sessions? Did you have any preference between being at the broadcast location or the receiving location? Please elaborate your responses.

Main campus focus group interviewees spoke of feelings of being ignored when they were the receiving site, preference for being the broadcast site, and possible technology improvements to narrow the transactional distance: "I feel sometimes the instructor, she is just talking to the [regional site], and then every now and then will remember that we are on the other side, and she will then ask us questions" (MCFG Interviewee 1):

> Our preference is to be where the instructor is because if you have a question you can ask them. Otherwise on the other site, you have to basically do jumping jacks to get attention. We have to yell to get the instructor attention because the other site, they don't have a screen to see us. (MCFG Interviewee 2)

> If we had a microphone and a button in front of us like at other schools I've seen, we could push a button and get the instructor attention right away and they would know we had a question. Like it is now, they don't see us and we have to break in on the lecture to get her attention. (MCFG Interviewee 1)

A main campus focus group response included additional equipment to parallel classroom experience with those who experienced the live classroom with instructor present: "It would be beneficial to us if we had an extra screen where we could see the instructor at the other site in addition to the material" (MCFG Interviewee 3).

Regional campus responses expressed the value of being in the class with the instructor: "We were with the instructor, and; I think most every person in our class was paying attention" (RCFG Interviewee 1); "I can pay attention better when our instructor

is teaching in the classroom. There is interaction" (RCFG Interviewee 5); "I loved them, being the broadcast sessions" (RCFG Interviewee 3). The regional campus focus group students agreed on the importance of VC equipment to connect them with the instructor: "That has the biggest impact. I want to see my instructor, I want to see her and hear her" (RCFG Interviewee 4); and "When our instructor was the *phantom professor*, why did we have to broadcast at all? (RCFG Interviewee 2). Regional campus students stated their concern over the inequality that they were the broadcast site far less than the main campus students: "We have to go through VC receiving every session except for four during the whole term. The other group is in the class except only four sessions" (RCFG Interviewee 5). Students were also in agreement that the instructor is more important than the technology: "Having the best instructor takes priority over the technology" (RCFG Interviewee 3).

Focus Group Question 5. If given the option to complete your nursing degree predominantly through VC courses, would you exercise that option? Please explain your answers.

This question evoked responses focused on the importance of the connectedness to the instructor and frustration over faculty not using the existing technology to accommodate the need for interaction: "The user of the technology is what makes the difference. If one teacher is on the computer screen and everyone can see that one person, it would work better" (MCFG Interviewee 2); "Not using the technology in a way to put us close to the instructor is frustrating" (MCFG Interviewee 2). "It's not about VC but about the instructor. The teachers lost respect in the first week of class because they didn't know how to use the technology" (MCFG Interviewee 4). Students stated: "I

would like that if I was able to see the instructor… The technology is useful but they haven't learned to use it effectively" (MCFG Interviewee 4).

Regional campus focus group responses were also concerned with the teaching methodology:

> I like putting it all together in the case studies, it is how I learn, but I don't know if the teachers need to already have the answers laid out and every answer covered first. Case study, answer, and study guide. (RCFG Interviewee 2)

Focus Group Question 6. Given, what you experienced throughout the course with VC technology: What would you recommend to improve, change, correct, or in other words, enhance your experience as a student participating in studies at a distance campus of the college?

Main campus focus group responses included statements regarding the importance of using VC technology to interact with instructors, instructional material, and with other students: "You can see what is important and what is not important when you see a person presenting something" (MCFG Interviewee 1); "It's not the technology, but it would be great if they implemented it the way it is supposed to be used" (MCFG Interviewee 2); "We need to see teachers as we are visual" (MCFG Interviewee 4); and, "It goes back to instructors being willing to learn that technology so they could zoom in on a student if they want to" (MCFG Interviewee 5).

Regional campus focus group responses included statements concerning more effective use of existing equipment, communication protocol, faculty training, and student orientation: "There is no reason why our microphone shouldn't be muted when the professor is presenting. Mute it during presentations so we can do what we normally do in a class" (RCFG Interviewee 1); "Yeah and then establish some sort of signaling.

Some people are shy and won't ask. Students now have to interrupt to ask a question" (RCFG Interviewee 4); and "Training for the professors, not only that but do a training before the course begins, and then have an orientation training for students on the first day" (RCFG Interviewee 5).

End of Course Summary

An EOC survey was administered by the college and given to the nursing students of both campuses. The researcher was not granted access to the complete surveys; however, a summary of comments was assembled by the director of nursing and given to the researcher to include in the study. It is not known whether all of the comments were included; however, it is assumed that all comments concerning VC technology were included in the summary (see Appendix F).

Eleven comments were listed from the main campus location and five comments from the regional campus. Selected comments that were comparable with the interviews and focus groups from the main campus were: "Simulcasting was ok. It was hard at times when some of the professors don't know how to use the technology properly" and

> As for the simulcasting, I felt it was hard to understand when the [regional campus] group was presenting. We were never able to see the instructor lecture. It felt like a big disconnect. It would save a lot of time if at least one instructor was able to work the computer and get [Regional campus] on the projector easily. (Main campus comment)

Regional campus comments similar to interviews and focus groups included: "Every teacher involved in simulcast: Learn how to use equipment. This is the school choice for broadcasting, not ours. I really do not want to hear "I'm not good with technology" and:

> The concept of distance can be very effective, as long as all the equipment works properly and the teachers are engaging and are able to explain the material well. This semester showed the need to improve media/hardware use, as there were technical difficulties (i.e., screen grainy, sound issues, cameras not working).

(Regional campus comment)

The EOC summaries were coded then triangulated with the interviews and focus groups, as part of the data corpus.

Codes

According to Saldańa (2013), multiple cycling back through the corpus of qualitative interviews should lead the researcher from codes to categories to themes. A careful and thorough analysis of the data corpus led the researcher through two cycles of coding. The initial step, however, was the development of a codebook (Saldańa, 2013). Roulston (2010) stated: "The process of coding and reorganizing codes into categories is a creative one in which the analyst plays with the data, and tries out different ways of thinking about how the data might be understood" (p. 153). Saldańa (2013) stated: "Qualitative inquiry demands meticulous attention to language and deep reflection on the emergent patterns and meanings of human experience" (p. 10). Saldańa's recommendation was: "Start coding as you collect and format your data, not after all fieldwork has been completed" (p. 20). Following Saldańa's methodology allowed the researcher to begin first cycle coding immediately upon completion of the first interview.

Theory-based codes. Boyatzis (1998) recommended the development and use of thematic coding. The process of developing codes were for the purpose of using them in thematic analysis. Boyatzis stated that "The use of thematic analysis involves three distinct stages: Stage I, deciding on sampling and design issues; Stage II, developing themes and a code; and Stage III, validating and using the code" (p. 29). Boyatzis further stated that "these approaches can be considered to form a continuum from theory-driven to data-driven approaches" (p. 29). This process was followed by creation of a code book based on the theories used in the present study: Rogers' Diffusion of innovations,

Knowles' Andragogy, and McClusky's Theory of Margin. Initially, 30 theory-based a priori codes were derived from a careful review of the theories. Seven additional a priori codes were added concerning interaction between students, instructors, and technology based upon the findings in a similar study (Balkin et al., 2005); for a total of 37 codes with which to begin data analysis.

Data-driven codes. Data-driven or inductive coding began with the first raw data collected from interviews (Saldaña, 2013). These data-driven codes were combined with the initial theory-based codes. After all interviews were completed, a second-cycle of coding began; 30 in vivo codes were developed from the corpus that was representative of student responses whether from the main campus or the regional campus. This resulted in a code book consisting 67 codes used in assigning codes to data chunks during the review and analysis process (see Appendix G).

Categories

According to Saldaña (2013) there is a natural progression in qualitative data analysis from codes to categories to themes; from "particular to general"; or "real to abstract" (p. 13). After the second cycle review of the data corpus, interview responses were divided into five categories: Interaction, equipment, teaching methodology, instructor training, and student orientation (see Appendix G, bottom of page).

Table 3 shows the five categories and the frequency based on times mentioned by individual, focus group interviewees, and EOC survey summary of the data corpus. Concerning frequency counts in qualitative data: Saldaña (2013) stated, "Frequency of occurrence is not necessarily an indicator of significance …. Counting is easy; thinking is

Table 3

Frequency Table by Category

Categories	Regional campus responses	Main campus responses	Combined totals
Interaction	96	105	201
Equipment	76	100	176
Teaching methodology	57	64	121
Instructor training	42	44	86
Student orientation	33	31	64

Note. The categories are rank order by frequency.

hard work" (p. 39). For the researcher, counting the number of occurrences that specific codes surfaced during interviews, focus groups, and statements in the college generated EOC survey summary led to the formation of categories and prioritization of importance as viewed by students.

In the present study, students frequently placed order of significance on interaction primarily with the instructor as the most important category: "Having the best instructor takes priority over the technology" (see Appendix G); followed by interaction with other students; "I think that interaction between the people is what VC is about" (see Appendix G). Students expressed an urgency for instructors to receive training for the VC technology used to connect the classes: "I don't mind the VC, but the overall impression is that the professors are not that great at it" and "Maybe the IT should install and teach the staff how to manage the equipment" (see Appendix G). The third priority was the equipment itself, which was considered incomplete in that it did not accommodate student need for continuous contact with students, instructors, and materials between the broadcasting and receiving site: "I want to be able to hear, understand, and be able to ask

questions freely" and "I am not opposed to VC [technology], but not if it is set up the way this is designed" (see Appendix G).

Teaching methodology, which included many comments concerning the flipped classroom and team teaching approach; both introduced to students for the first time: "The professor would tip the scales of having a VC class" and "Having the best instructor takes priority over the technology" (see Appendix G). The final category—Student orientation, included items such as an introduction to the new technology, how it works, communication protocol, flipped classroom approach, and several other items that would have improved student transition into the new learning environment. The extent of student orientation as remembered by students included statements such as "they told us to keep quiet" and "They told us you have to figure it out and make it work" (see Appendix G), all of which will be discussed in the next chapter. Once the categories were determined, themes were then developed as a next step in analysis (Saldańa, 2013).

Themes

Saldańa (2013) stated: "simple code frequency is not always a trustworthy indicator of what may be significant in the data. Use this technique as an exploratory heuristic for qualities, not as an algorithm for mere quantities" (p. 202). A thorough review of the data corpus, distilled to five categories; then, were developed into three themes. Each included elements of multiple categories when examined. Additionally, each of the themes were required to point back to the research question: Is VC technology a viable option for nontraditional degree-seeking undergraduate students? The three themes: (a) Interaction with instructors, materials, and distant students are key elements affecting adoption decisions of students regarding VC technology; (b) Student

adoption decisions are influenced by faculty members in their use of VC technology; and (c) Student opinions indicate that reinvention is necessary for VC technology to be fully adopted into the nursing program. These three themes will be discussed in detail in the next chapter of this study.

Chapter Summary

Included in this chapter were the results from the data corpus of the current study. The interview questions were listed with responses based on campus location. Focus group interviews were listed based on campus location as well. A description of the codebook was provided, which listed the direction from codes to categories to themes. The three emerging themes were listed and will be elaborated in the next chapter.

Chapter 5: Discussion

The purpose of the present case study was to answer the research question: Is VC technology a viable course delivery option for nontraditional degree-seeking undergraduate students? Qualitative interviews, focus groups, EOC summaries, and observations were analyzed, coded, and then triangulated to determine whether students would consider one of three adoption decisions: Adopt VC technology as is, reject VC technology, or accept VC technology with modifications—termed reinvention (Rogers, 2003). Five categories were discovered, from which three themes developed. The themes are: (a) Interaction with instructors, materials, and distant students are key elements affecting adoption decisions of students regarding VC technology; (b) Student adoption decisions are influenced by instructors in their use of VC technology; and (c) Student opinions indicate that reinvention is necessary for VC technology to be fully adopted into the nursing program. Each will be discussed in this section, including recommendations designed to address each theme regarding modifications based on student opinions, body of research, extant literature, and industry standards currently guiding effective use of VC technology in higher education at present.

Theme Discussion

Theme 1. Interaction with instructors, materials, and distant students are key elements affecting adoption decisions of students regarding VC technology. All students interviewed, except one, preferred to be in the broadcast site with the instructor. The interviewee who preferred the receiving site stated: “Receiving is easier, you don’t have to look at any cameras; you just sit back and listen” (MC 9, Week 7). This student expressly did not want to interact or feel pressured to interact with the instructor. Being

on the receiving site meant being a passive observer and more likely not to be called on to answer questions. For the balance of the interviewees, this was exactly why they preferred not to be in the receiving site during a broadcast. Many students made statements concerning the receiving site such as: "I'm not against [VC technology] … but, would not want to be in the receiving site" and "When we are on the receiving end, we feel disconnected" (see Appendix G).

Students expressed the importance of being engaged and to interact with presenting instructors, the materials presented, and the students at the distant site. Indicative of this preference were statements such as: "I have a preference to be where the instructor is because if you have a question, you can ask them" and "I want to be able to hear, understand, and be able to ask questions freely" (see Appendix G). Students expressed the need for constant view of the instructor at the receiving site during the class; a continuous and clear view of students located at the distant site; continuous view of the materials, which included PowerPoint presentations, case study scenarios, and discussion questions. Students also expressed their desire to be able to openly communicate and interact in real time with instructor, students, and material. In essence, students at the receiving site expressed their need and expectation of parity (same experience) whether at the receiving or the broadcast location. When students were prevented from this experience through VC technology, their expressed dissatisfaction were in statements from: "I like the idea of VC tech but it needs to be better" to "It's highly unproductive for me personally" (see Appendix G).

Students progressing from what Rogers (2003) termed the knowledge stage through the second stage of the innovation decision stages—the persuasion stage—

experienced attitude formation in that many became frustrated, discouraged, and disengaged.

Student-instructor interaction. Students expressed as key, the relationship between student and instructor. Statements such as: “The professor would tip the scales of having a VC class” and “Having the best instructor takes priority over the technology” (see Appendix G). Many of the early concerns expressed by regional campus students were concerns about interaction with main campus instructors. The belief was that grades would be negatively impacted due to this separation resulting in a longer amount of time required to get to know the instructors from a distance (see Table 3). Throughout the semester there was a stark difference in responses between broadcast and receiving sites concerning this aspect of contact; that is, until the regional campus professor delivered her first broadcast to the main campus. The reversal of interview responses made it clear that students on the main campus experienced the same frustration that the regional campus students expressed when in the receiving site of the class: “The difference was huge, it didn't feel real, maybe it is because we are not used to it” (MC 1, Week 1) and “I can’t see the instructor … and when she was talking I felt like I was concentrating so hard on what she said that I couldn’t retain the information. I do like to see the instructor in front of me” (MC 10, Week 8).

When regional campus students experienced being the broadcast site for the first time, they expressed renewed enthusiasm for VC technology use: “With the course broadcast being from my location, I enjoyed it. It felt like I was in a regular classroom setting …. I could pay more attention to the professor’s lecture, and not feel uncomfortable asking questions or making comments” (RC 6, Week 7); and “When our

professor broadcasts they can't see her. And sometimes they can't hear her. I have heard from [main campus] students they get frustrated ... no one can ask a question because of it" (RC 8, Week 11).

Table 4

Student-Instructor Interaction

Observation	Main campus quotes	Regional campus quotes
Instructor introduction: "We will be simulcasting all semester and it will be a positive experience. Sometimes we will broadcast from [Regional campus] and sometimes we will broadcast from [Main campus]. We will work in teams; no independent work this semester" (Observation 1, Main Campus, 9:40 a.m., Week 1 August 27, 2014).	"I do better going to a face to face class to get the full everything out of it. I couldn't imagine being at home online and being successful" (MC 8, Week 7). "Of course, I would rather be at the site where my teacher is physically in front of me. I definitely like it better" (MC 11, Week 8).	"There is equal time given between the campuses—as long as the professor can see us. She doesn't see what is on the screen, because the screen is behind her when she is turned toward the main campus students" (RC 1, Week 1). "I think my grade is going to drop because my inability to connect with the teachers" (RC 2, Week 1).
Main campus instructor "What did you say [name]?" Student (RC 4) repeats answer. "Yes" instructor replies, then explains further. Main campus instructor knew regional campus student by voice recognition and called him by name. The interaction example that after only two weeks, this student's fear of not getting close to instructors from other campus has been dispelled. Uncertainty reduction occurred (Observation 4, Regional Campus, 12:15 p.m., September 4, 2014).	"Most instructors come across as if they actually know the students from [regional campus]. They know their names and actually call out their names" (MC 11, Week 8). "Honestly, I dread when the VC is being broadcast from the other site, I am a visual learner and I can't see the other instructor" (MCFG Interviewee 2). "We can't ask questions when we need to of the instructor at the other site. She can't see us" (MCFG Interviewee 3)	"Because it's VC it's not as clear as face-to-face to see. Difficult to understand that personality. It will take longer to get close to them" (RC 4, Week 2). "Sometimes I don't ask a question because the instructor is at the other site" (RC 11, Week 14). "It is not going back and forth with interaction. There has to be some sort of way to communicate better using the system" (RCFG 3).

However, main campus student concerns were short-lived as only 20% of the broadcasts were from the regional campus. Responses from individual interviews, focus groups, EOC summaries, and observations are listed in Table 4.

Student-student interaction. Students expressed the importance of communicating in real time with the students from the distant site, whether they were located in the receiving or broadcast locations. Attitudes that were previously formed concerning the students of the other campus, were reconsidered or dismissed once both groups had experienced both sides of the VC course. Main campus students expressed empathy and concern for the regional campus students once they recognized how the receiving students experienced the class. Regional campus students tended to realize that rather than us-against-them, this was more they-are-like-us situation. Students became less heterophilous (separate) and recognized the homophily (similarity) of the group in that they were engaged in finding solutions to the existing problems associated with VC technology in the nursing program. Rogers (2003) referred to this as *matching*. Rogers stated that "Effectively matching an innovation with an organization's need is key to whether the new idea is sustained over time" (p. 423).

Noted in the interviews were that students over time were able to recognize student voices and personalities through the audio portion of the VC course even though they were unable to see each other through the existing system. From both the main campus and the regional campus interviews, students expressed strong desire to communicate with each other during the class presentations and during question and answer periods common in face-to-face class interaction. Responses from individual interviews, focus groups, EOC summary, and observations are listed in Table 5.

Table 5

Student-Student Interaction

Observation	Main campus quotes	Regional campus quotes
Camera angle [regional campus] in wide-angle shot and distant. No close up. Could not spot the speaker. Students in [main campus] stopped looking at monitor when [regional campus] presenting. Generally disengaged from looking at monitor. (Observation 1, Main Campus, 12:00 p.m., Week 1, August 27, 2014).	"I would like to see the [regional campus] people we are interacting with. I think it defeats the purpose of the VC if you aren't able to see the other people" (MC 2, Week 2).	"I don't even bother looking at the picture because it's blurry and fuzzy. I wouldn't know the students if I saw them in person. I couldn't make them out" (RC 1, Week 1).
Applause and laughter exchanged. Regional campus applauded Main campus presenting group. Instructor stated "Oh, they're not done yet!" laughter erupted, then: "But [Regional campus] are encouraging you!" "Thank you" [Main campus] presenter said. "You're welcome" [Regional campus] student replied. (Observation 4, Regional Campus, 10:40 a.m., September 4, 2014).	"I think if it's an even keel being able to interact with each other and those from other campuses. I think that interaction between the people is what VC is about" (MC 2, Week 2).	"The professors and students at main campus cannot see me, nor my classmates. Therefore, if we raise our hands to ask a question, they do not know" (RC 6, Week 7).
Students from regional campus recognize a main campus student and call her name to say hi. (Observation 7, Main Campus, 12:40p.m., September 24, 2014)	"It was nice today, I enjoyed it. [Regional campus] piped up and asked questions. We worked together today, which is something we haven't done" (MC 4, Week 4).	"As an online student you are not an isolated learner, but that is not extended to [regional campus] students" (RC 7, Week 11).
	"The thing I really don't care for is that we can't see the other group" (MC 8, Week 7).	"Sometimes when we present they don't even listen to us, but talk and we can hear them talking during our presentations" (RC 7, Week 11).
	"For me I just don't worry about them, out of sight out of mind" (FGMC 1).	It's like we are pretty much learning on our own sometimes. Because with us over there they can't see us. So we yell and talk out of turn and we can't see them or they us and we don't have a choice but to blurt out when we have questions" (RC 8, Week 11).
	"I think it is great that we can hear and learn from other students at the other campus, but at the end of the day it is hard to focus" (MCFG 5).	

Student-material interaction. From the initial interviews, there was a growing concern about what was termed the flipped classroom approach in course methodology for this particular student population. Students expressed a high amount of anxiety and confusion concerning the flipped classroom. They were frustrated throughout the semester concerning faculty preventing students from receiving case study scenarios and questions prior to the actual class time. Typically, in the same class period, students met in pre-assigned groups to prepare and present their findings in front of the class.

Repeatedly, students expressed frustration over being handed only one piece of paper for their entire five- to seven-member group to read, analyze, research, and prepare a presentation for class. On average, students were given 15 to 30 minutes in which to prepare. Upon presentation by each group, initially, no information was displayed on-screen while the presentation or discussions took place concerning these scenarios.

In later weeks during the semester, the instructors began to at least display each case scenario and questions on screen for receiving and broadcast sites to view. This tended to keep students engaged equally at both sites during these periods. Students expressed the importance to have access to the instructor while the material was displayed. They did not want an either/or situation. They expressed the need for continuous view of course materials and instructor when in the receiving location through VC technology as they would when in a live classroom with the instructor in front of them. In some interviews, one way expressed to overcome this issue was to have hard copies of case studies handed out in which they could write notes during presentations and discussions between instructor and students of both sites. Responses from individual

interviews, focus groups, EOC summary, and observations are listed in Table 6.

Table 6

Student-Material Interaction

Observation	Main campus quotes	Regional campus quotes
Lecture, PowerPoint, and interaction. Instructor engaging conversation responses from [Main campus] and [Regional campus] locations; mainly to make sure they are hearing and seeing material (Observation 1, Main Campus, 9:40 a.m. Week 1, August 27, 2014). Students are handed out one sheet per group that lists only one case study for them to prepare and present. No access prior. No access to other case studies before or during group presentations. Information not viewable. Regional campus students are passive observers. (Observation 5, Regional campus, 10:30a.m., Week 3, September 11, 2014).	"We can't see what they are presenting by just using projection screen and only one monitor" (MC 5, Week 5). "It would be beneficial to us if we had an extra screen where we could see the instructor at the other site in addition to the material" (MCFG interviewee 3). "If you can engage your eyes, ears, paying attention all at once, you learn more. If you have to shut down your other senses, you learn less. Getting more senses involved at the same time, helps learning" (MCFG interviewee 5).	"It feels more connected to the material. I paid attention more, when we broadcast" (RC 9, Week 11). "If I am able to communicate with the other class, we can get the extra information" (RC 11, Week 14). "We have asked how to see the case studies beforehand" (RCFG Interviewee 2). "Or even We are going to do these case studies tomorrow, here is the list of questions to go over and prepare for" (RCFG 4).

Theme 2. Student adoption decisions are influenced by faculty members in their use of VC technology. One of the most frequent statements made by students was that faculty members appeared to have little or no prior knowledge concerning operation and facility regarding VC technology. Faculty members used VC technology every year to facilitate second semester students. This was not a new technology to faculty members. Mentioned previously, VC technology was infused into the nursing program in 2006 to

expand the college nursing program to a regional campus. However, in informal discussions between the researcher and faculty members; plus conversations with media technologists concerning VC technology training; faculty members routinely declined optional training provided by the media technology department. This resulted in students new to the VC experience to assume that this was also a new experience to instructors using VC technology to facilitate the course. Much frustration was experienced by students in the early weeks of the semester due to what Rogers (2003) described as "passive rejection" on the part of faculty members mandated to use VC technology to connect the two sites together for class.

Evidence of rejection of VC technology by faculty included reluctance to use the technology for optimal performance. Frequently, faculty started class by asking the other site: "[Regional campus] can you hear me?" and "[Regional campus] can you see me?" This was followed by a response from the regional campus professor: "No, you need to move a little over to your right" (Observation 6, Week 3, September 17, 2014). After several sessions, the researcher observed that when the same question was asked of a different presenting instructor, rather than telling students to move left or right, she simply reached to the control panel and activated the camera to pan left or right signifying an increase in knowledge but a reluctance to use it unless prompted.

Throughout the term many observations were made and noted in which faculty members made comments during class periods typically when an instructor had difficulty switching screens, changing camera views, or experiencing frustration over the video or audio quality of the VC broadcast. Responses in individual interviews, focus groups, EOC summary, and observations are listed in Table 7.

Table 7

Instructor Passive Rejection

Observation	Main campus quotes	Regional campus quotes
Student to instructor 5: "Are you not liking this either? You don't seem to like it" (Observation 4, Week 2, 10:00 a.m., September 4, 2014). "You can't see me so just think of me as your invisible professor today" (Observation 9, Week 6, 11:30 a.m., October 1, 2014). Instructor5 broadcasting today. Black screen, doesn't switch on camera to see students at distance site. "Are we good to go?" she asks, but waits for another instructor to turn on. (Observation 10, Week 6, 9:40 a.m., October 2, 2014). Instructor 5 is calling on main campus students to answer questions. Does not have main campus student roster in front of her to call on individuals and does not know their names; nor does she have camera view of main campus students to see if they raise a hand. Yet, she tells them one person at a time to answer. Silence. Main campus instructor activates camera so regional campus instructor 5 can see main campus students. (Observation 13, semester Week 12, 10:30 a.m., November 13, 2014).	"Only in the beginning of each class, when there is a problem with the instructor turning on the screens, it gets delayed but everything has gotten better as the weeks go by" (MC 3, Week 4). "Only one professor [of the five] works with it but none of the others. It seems haphazard on the program anyway" (MC 7, Week 5). "It's not reassuring that they don't know how to make it work" (MC 11). "If they haven't learned it, there seems to be no incentive to learn it. There needs to be a change" (MCFG 1). "Not about VC but about the instructor" (MCFG 2). "The instructors don't seem willing to adapt to the technology necessary to provide teaching in a way that we can learn" (MCFG 3). "It took a whole semester to just turn the volume down to lower the sound on the other class" (MCFG 4). "It goes back to instructors being willing to learn that technology…" (MCFG 5). "Simulcasting was ok. It was hard at times when some of the professors don't know how to use the technology properly" (EOC Summary, see Appendix F).	"The professors on the other side now know how to properly use the equipment better to switch the screen we are seeing on our side" (RC 6, Week 7). "I'm probably most irritated about the VC programming because the instructors seem like they don't want to learn how use VC. It's like they don't have interest in learning how to use the technology" (RC 9, Week 11). "The teachers are standing up there and don't even know how to turn on the system, or don't know how to operate the machinery" (RC 9, Week 11). "When our instructor was the "phantom professor" why did we have to broadcast at all?" (RCFG 2). "If the instructors went through all the training, they would know what to do …" (RCFG 4). "At the beginning they wasted so much time. About 15 minutes, now we still start almost at 9:40 every day. What do you see now? Can you see that?" (RCFG 5). "The telecast is awful, and the excuse of it being a part of the curriculum and not being able to be modified is not fair because a lot of students struggle with this kind of learning" (EOC Summary, see Appendix F).

Mandates to adopt in education. According to Rogers (2003) mandates to adopt meet with more resistance than voluntary or consensus decisions. The present study is an example that mandates in the decision process can be met with resistance. However, before dismissing faculty as simply passively rejecting VC technology, it is important to consider what Rogers termed system blame. "*System blame* is the tendency to hold a system responsible for the problems of individual members of the system" (Rogers, 2003, p. 119). The faculty members are under pressure to utilize VC technology. However, the system may be inappropriate for the organization in its present state.

Rogers (2003) stated that, "In an organizational setting, a number of individuals are usually involved in the innovation-decision process, and the implementers are often a different set of people from the decision makers" (p. 179). When considering faculty members as opinion leaders, Rogers stated: "The most striking characteristic of opinion leaders is their unique and influential position in their system's communication structure: they are at the center of interpersonal communication networks" (p. 27). With five faculty members instructing students in a team approach: "Influential persons can lead in the spread of new ideas, or they can head an active opposition" (p. 27). Rogers stated that indecision, resistance, and passive rejection are considered particularly disruptive in the implementation stage of the adoption decision; unless resolved could result in the discontinuation of the innovation. Responses in individual interviews, focus groups, EOC summary, and observations are listed in Table 8.

Theme 3. Student opinions indicate that reinvention is necessary for VC technology to be fully adopted into the nursing program. Rogers (2003) stated: "Reinvention is the degree to which an innovation is changed or modified by a user in the

Table 8

System Blame

Observations	Main campus quotes	Regional campus quotes
Regional campus view of students not possible as only one screen at main campus. Instructor 4 has to decide to show case study document or students. Elects to display material (Observation 5, 11:00 am, Week 3, September 11, 2014). Instructor 4 working with media tech person on break. "Boy, this is really complicated." Media tech replies: "The switching knobs are labeled wrong, which contributes to the problem" (Observation 5, 11:30 am, Week 3, September 11, 2014). "This is the first time I ever failed a test. I blame the video conferencing for this because I couldn't get all the information I needed to pass" (Observation 11, 9:30 am, Week 10, October 29, 2014).	"I do like the idea of simulcasting with other professionals… you just couldn't do the way it is set up now. This is merely incomplete" (MC 8, Week 7). "We need dual screens, large so we students can see them and on their side so they can see us all while the PowerPoint is on the display. This is not conducive to anybody… (MCFG Interviewee 3, November 20, 2014). "I don't like the simulcast. It is too distracting trying to pay attention to a video recording of the other lecture. They can't see us. Too hard to pay attention when [Regional campus] has the lecture" (EOC summary, see Appendix F). "When we are on the receiving end, we feel disconnected" (EOC summary, see Appendix F).	"I saw it as interference to my learning in class because at times, I could not understand what the professor was saying, or the student's comments" (RC 6, Week 7). "It is also different if the professor is up front by the microphone, it is clear. But if the professor in the back is talking and something makes noise, it cancels out the microphone" (RCFG Interviewee 4, October 29, 2014). "This semester showed the need to improve media/ hardware use, as there were technical difficulties (i.e., screen grainy, sound issues, cameras not working; EOC summary, see Appendix F). "Lectures are not beneficial as there are so many disruptions with simulcasting" (EOC summary, see Appendix F).

process of its adoption and implementation" (p. 35). According to Rogers (2003), what was originally thought to be an anomaly by researchers, reinvention was initially dismissed in adoption research. Once researchers began to study innovations at the implementation stage, it was discovered that "a great deal of reinvention was found in

most diffusion programs" (Rogers, 2003, p. 183). According to Rice and Rogers (1980**),** reinvention is a favorable quality of an innovation. Rogers (2003) stated that "as a result of reinvention, an innovation may be more appropriate in matching an adopter's preexisting problems and more responsive to new problems that arise during the innovation-decision process" (p. 185). Results from a national survey of innovation in public schools revealed that when an educational innovation was reinvented by a school, its adoption was more likely to be continued (Berman & Pauly, 1975). Reinvention can occur during this stage to adjust the innovation to better fit the needs of the nursing program for accreditation purposes, for student satisfaction, and for faculty support.

Student interviews, focus groups, EOC summaries, and observations produced data rich with statements that suggested reinvention or modifications needed to minimize the technological deficits and maximize the interaction aspects of the VC experience (see Table 9).

Findings

The five categories that led to the themes previously discussed can be elaborated to discover a deeper understanding of the findings from the perspective of the receivers of the innovation. The students that rejected VC technology in this study were 37.5%, all of which were from the regional campus, which was the receiving site 80% of the time. This proved counterintuitive to other studies. For example, qualitative studies typically showed no significant difference in learning outcomes while at the same time students from the broadcast site preferred face-to-face and considered connection to the distant sites a distraction; whereas, those at the receiving sites tended to be more accepting of the VC technology (Mattheos et al., 2003). In the present study, many of the interviewees

Table 9

Reinvention of VC Technology

Observations	Main campus quotes	Regional campus quotes
Clicks, scrapes heard from [Regional campus] when they move it is heard in [Main campus] sound system. [Regional campus] students trying to be quiet; but every movement is picked up (Observation 1, Week 1, 9:45 a.m., August 27, 2014). When lights are dim in [Regional campus], [Main campus] professor cannot see students on wall-mounted monitor … only shadows (Observation 5, Week 3, 10:00 a.m., September 9, 2014). Side conversation between [Main campus] instructors: "Why can't we see the [Regional campus] students or professor?" "We can't because there is just one screen for PowerPoint and no screen or monitor to view students at the same time" (Observation 10, Week 6, 9:45 a.m., October 2, 2014). [Regional campus] students standing facing front of classroom where the camera is active; the camera at the back of the room in [Regional campus] still inactive (Observation 14, 10:00 a. m., Week 14, November 26, 2014).	"It would be nice if they put a large television up front so everyone could see it if they want. Possibly another monitor or two for students to view without obstructing screen for PowerPoint" (MC 2, Week 2). "Why are the mics from the ceiling doing nothing? Amplify and use those suspended mics to help in the [main campus] class as well as [regional campus]" (MC 4, Week 4). "I'm underneath the monitor in [main campus] and I see when they present [regional campus], they have to face the camera and away from the students" (MC 7, Week 5). "Dual screens, large so we students can see them and on their side so they can see us all while the PowerPoint on display. This is not conducive to anybody by not seeing the PowerPoint slide and the other students at the same time" (MCFG Interviewee 4). "When we are on the receiving end, we feel disconnected" (EOC summary, see Appendix F).	"It would be different if instructor was looking at me and me looking at her. Right now we are looking at the back of her. Even if we could see more detail of her in color. I don't feel she is teaching me per se" (RC 2, Week 1). "When we get up to present we have to face the camera and talk to the camera, so now our backs are to our entire class. I don't like that at all. When they address us they are also addressing their fellow classmates face to face" (RC 5, Week 2). "I would make sure the cameras were such that you would be able to see the other classroom at all times… It would feel more like we were all in the same classroom if constant view for the benefit of both groups" (RC 7, Week 11). "When our professor broadcasts they can't see her. And sometimes they can't hear her." (RC 8, Week 11). "I was annoyed by the technology" (EOC summary, see Appendix F).

were quite vocal in explaining their decisions in offering possible solutions to the phenomenon. The next section will further amplify the categories for more clarity of what student opinions were on how to create a better experience more conducive to student expectations and intended outcomes.

Implications

The implications from this study were several. Considering that this study focused on student opinions regarding an innovation that was implemented in 2006 by the college, this study is more a revisiting of the innovation to determine whether it has been fully adopted by the college and presently serves the purpose for which it was intended; to meet accreditation requirements regarding parity between the main campus and the regional campus in the nursing program. One indicator could be NCLEX-RN first time pass rate percentages between the two campus locations. For 2014, the pass rate percentages were 82.82% for main campus graduates and 64.29% for regional campus graduates; a difference of 18.53%. Though it is a phenomenon with multiple variables too complex to attribute the lack of parity to a single variable; the present study was designed to illuminate the aspect of connecting learners from two campuses to information through the medium of VC technology.

Many interviewees indicated their main goal was to learn what was necessary to successfully pass the NCLEX-RN licensure examination for nurses. A statement made by multiple interviewees reflected a common outcome expectation: “That is the key for this program; to pass the NCLEX” (RC 10, Week 12). An early concern was that problems with the VC technology might interfere with outcome goals. However, over time, opinions of most students were captured in the following quote: “I believe my grades are

dependent on me and not on the things around me" (MC 2, Week 2).

Rogers (2003) listed uncertainty reduction as a necessary occurrence for favorable adoption decisions to occur. Results of the current study could suggest that uncertainty reduction occurred sufficient for the majority of interviewees to make favorable adoption decisions with 20 of 32 interviewees' decision to accept VC technology (see Table 10).

Table 10

Innovation Decision Matrix

Adoption decisions	Main campus	Regional campus	Combined
Accept unchanged	5 (15.62%)	1 (3.125%)	6 (18.75%)
Accept with changes	11 (34.375%)	3 (9.375%)	14 (43.75%)
Reject innovation	0 (0%)	12 (37.5%)	12 (37.50%)
Total	16 (50%)	16 (50%)	32 (100%)

However, when looking at the table by individual campuses: Fully 100% of main campus interviewees made the decision to accept VC technology; whereas, only 25% of the regional campus interviewees accepted VC technology. One possible explanation for this phenomenon is that regional campus students were the receivers of the VC broadcast the majority (80%) of the time. These numbers could suggest that being on the receiving end of the VC broadcast in its present state did not provide a similar experience sufficient for uncertainty reduction and favorable innovation decisions. For those primarily on the receiving end, VC technology would not be considered a viable method of course delivery in parity with the broadcast site. With 100% main campus interviewees accepting the innovation compared with 25% of the regional campus interviewees accepting the innovation would suggest that when VC technology does not sufficiently mimic a live class experience, students are more likely to reject VC technology as it is

not in parity.

Rogers (2003) stated that reinvention occurs most often in the implementation stage of the innovation decision process. The interviews, focus groups, EOC summaries, and class observations resulted in the development of five categories: interaction, equipment, teaching methodology, instructor training, and student orientation. These categories contained recommendations made by students to correct the inadequacies that in their opinion restricted optimal interaction capabilities of the VC technology.

Interaction

Interaction between student and instructor was listed in multiple interviews as the most prominent need of students as discussed in Theme 1 of the present research. Interaction was the area of most concern by students. Interaction with the instructor was the predominant frustration that regional campus students experienced considering their campus was the receiving site 80% of the time. With missing or inoperable equipment, it was not possible for students at the regional campus to experience interaction with instructors, materials, and the distant site students simultaneously. Students at the main campus were unable to interact with distant site students; yet, they were able to interact with instructors and materials predominantly in a face-to-face format since the main campus was the broadcast site 80% of the time.

Lőgdlund (2010) argued that students participating in VC courses were not interacting as part of learning, but reduced to participant observers. He criticized VC courses in that they were “organized to fulfill the requirements of practice rather than to promote learning” (p. 195). Interaction sufficient to be in parity with a live classroom experience requires reinvention, or modification to the existing VC technology.

Interaction, though considered the most important of the five categories, is also a variable dependent upon each of the remaining four categories.

Equipment

Missing equipment, inoperable equipment, and positioning of equipment (see Appendix H) were subcategories within each interview discussion. Students were asked to describe what a course using VC technology would look like if they were able to create it. In several interviews no changes were recommended. These, however, were most common among interviewees whose decisions were to adopt VC technology unchanged or in the early interviews from the main campus prior to switching the broadcast to the receiving site for presentations from the regional campus. Regional campus students chiefly were the first to recommend additional equipment in interviews prior to becoming the broadcast site.

Equipment became a category almost immediately in that each interview gravitated toward equipment as a point of dissonance (Rogers, 2003). Inoperable equipment, fuzzy projector screen view, lack of high definition quality, too large a screen for small classroom where students were seated within a few feet of the screen; too sensitive a microphone system for the small regional campus classroom; lack of enough monitors to gain constant view of the main campus students, instructional material, and presenting instructor at the same time (see Appendix G).

Monitors. The main campus classroom had one small monitor mounted on the side wall about 30 feet from the location where faculty members stand when presenting to the class. This monitor was angled for instructor view but too small to recognize students or see a raised hand of students at the regional campus site. Regional campus

and main campus students recommended extra monitors for their class were needed to accomplish constant view of instructors, materials, and other students (see Table 9).

Microphones. Microphone sensitivity was a prominent issue among all interviews. Some issues were resolved early in the semester during a routine systems check by the media technologists. Discoveries such as cable connections attached incorrectly or loose, for example. Other situations like the hyper-sensitivity of the regional campus microphones may be due to an improper microphone and amplification setup placed in a very small space that was designed for a much larger room. In several interviews, low-cost solutions were recommended, such as simply turning down the volume or muting the microphones at the receiving site and then unmute them when it was time for presentations or discussions between the two sites. Many no cost or low cost recommendations could be included in faculty training segments so instructors would know about access to controls and adjustment of the existing system (see Tables 8 & 9).

Cameras. The need for repair or replacement of an inoperable camera on the regional campus was recognized early in the semester as expressed in comments during student interviews and in observations; however, it was neither repaired nor replaced during the semester. Students of both campuses commented and expressed concerns that regional campus students had to turn their backs to their in-class students in order to face the camera that was operational when presenting to the main campus. Main campus students expressed concerns that when the regional campus instructor presented, only the back of her head was seen due to the inoperable camera at the regional campus site (see Table 9).

Recommended locations for cameras in each classroom for VC tech use by the

students: “The camera now in [Regional campus] looks like a security cam view. And we can’t see faces. Maybe if the camera was eye level … what you would see if you were looking at people in the other class” (MC 8, Week 7). In several sessions, the researcher observed that when instructors looked directly into the monitor of the regional campus it appeared that she was making eye contact with students. This was because the instructor camera on the main campus was mounted on the side wall beneath the monitor screen. When the main campus presenter looked at the monitor of the regional campus site, it gave the appearance that she was looking directly at the regional campus students. During that presentation, the researcher was observing from the distant site and noticed that all students in that moment appeared to be focused and engaged in active listening to the instructor on-screen. At the same time, the instructor could see the students from the distant site looking at her on-screen. However, when the instructor concluded her discussion with the regional campus students, due to the location of the camera and monitor mounted on the side wall, she was forced to turn away from the screen to look at the main campus students where she was physically located. There was a noteworthy drop in student attention to the point that after a few minutes the receiving site students were disengaged. They remained quiet, but had turned their attention from the screen and presenter to looking at their notes, or highlighting in their books, or just sitting quietly. This exchange showed the importance of placing the camera close to the monitor screen for a perceived and real interaction between the instructor from the broadcast site and students at the receiving site. A common comment referencing this was: “When we are on the receiving end, we feel disconnected” (see Appendix G). Other researchers such as Karal et al. (2011) reported: “There are some difficulties faced in the one-to-one

interaction because of certain environmental factors such as…the number and the angle of the cameras" (p. 288). Adequate cameras for both sites are essential to complete the communication loop between instructor-student interactions.

Equipment placement. Relocating existing equipment is equivalent to Rogers' (2003) reinvention during the implementation stage of the innovation-decision process. Several students made recommendations concerning placement of cameras and monitors. Gaze angle is a term used in VC technology that describes the separation between where the instructor is looking and where the actual camera is located (McNelley, 2014). Suspending monitors from the ceiling in the center of the larger main campus room would allow the presenter, whether student or instructor, to gain a continuous view of students at both sites. Mounting the camera immediately beneath or beside the monitor would correct the gaze angle and appear as if eye contact was made between the presenter and the students at the distant site.

The large auditorium classroom of the main campus seats approximately 100 students. When students seated themselves, they typically left a large area in the center of the room from front to back where students did not sit. This area provides a natural location to either suspend monitors, facing front and back, so the instructor can view the regional site and main campus students without turning her head when addressing students at either site. Monitors in the middle of the main campus classroom would allow students toward the back half of the class to also have constant view of the regional site students. Additional monitors were suggested for placement on the front wall of the room, one on each side of the projector screen so students in the entire main campus auditorium classroom could clearly see the students from the regional site.

In the regional site, students also recommended mounting a monitor at the front of the classroom so they could have constant view of the main campus students with a second monitor for continuous view of the presenting instructor. The projector screen would then be used for continuous display of the material presented. Visual connection and recognition is significant to student-student interaction based on interview statements during the present study.

Camera relocation was discussed in some interviews as a possible correction to give students the illusion of direct eye contact. Cameras are placed as near the front center of the room and at eye-level, making it possible for students or instructors to look at the screen view of the distant site while speaking directly to them; much like desktop videoconferencing or a personal Skype call or GotoMeeting presentation from a laptop where the webcam is built into the laptop; or a cell phone using FaceTime, for example. Relocation of cameras were recommended to be mounted in close proximity of the monitors toward the center of the room in the main campus classroom and in the center of the front wall for a more straight on angle to simulate direct eye contact.

In the regional campus classroom, cameras could be removed from the top corners of the room and moved to the middle of the front and back walls of the classroom. Discussed previously, when students perceive that instructors are speaking directly to them even through a monitor screen, it keeps students engaged and attentive to the information that is being exchanged, information crucial to building a knowledge-base for successful course completion and high stakes test preparation like the NCLEX-RN exam.

The list of equipment described was based on student comments and substantiated

by researcher classroom observations in addition to best practices currently in use concerning VC technology in higher education applications at the present time. Such equipment additions or changes should serve to improve student-instructor, student-student, and student-material interaction in addressing common desires of students: "I want to be able to hear, understand, and be able to ask questions freely" (see Appendix G).

Teaching Methodology

Classroom management issues, student engagement techniques, coursework presentations, and professionalism were mentioned during interviews; however, each concern was outside the realm of the present study as they did not address the research question. A discussion of the flipped classroom, case studies, and group presentations also surfaced in each of the 32 interviews, all of which did have a connection with the research question. On several occasions it was necessary for the researcher to redirect the interviewee back to issues concerning VC technology, otherwise many entire interviews would have been dominated by these topics. However, in a similar study, Balkin et al. (2005) conducted a qualitative case study to determine classroom management issues and interactivity between student-student and instructor-student interactions at remote sites and close sites. Interactivity between students and instructor was negatively impacted. The outcome from the student interviews was that, "issues of classroom management, facilitation at remote sites, and responsibilities of students versus those of instructor were identified as significant themes" (p. 363). Though much of the earlier interviews seemed negative concerning the flipped classroom, case studies, and group presentations, this teaching methodology has been reported to work quite well in situations involving

nontraditional learners in distance courses. Knowles' Andragogy includes four assumptions of which the fourth assumption—adult learners are focused on problem-centeredness or problem-based learning—meaning that the nontraditional student is solution-oriented and focused on the application aspect of learning, for example, case studies, flipped classroom, and group presentations, all of which contribute to retention and facility of new skills learned (Bynum et al., 2002; Latanich et al., 2001; Lőgdlund, 2010).

Flipped classroom. Initially in the interviews, the flipped classroom was considered by the researcher as an issue outside the context of the present study. However, when it continued to be part of the discussion and in some interviews, dominated the discussion, the researcher began asking for student definitions of the flipped classroom. Interviewees responded in such statements as: "The student and teacher role become flipped, the student becomes the teacher" (MC 6, Week 5); "The students present and not the teachers" (RC 9, Week 11); and, "They say that we have a flipped classroom because we are given everything in class" (RC 9, Week 11). All of these statements reflected students' misunderstanding of the flipped classroom.

Case studies. Coinciding with the flipped classroom misinterpretation were instructors' reluctance to provide students with the case study scenarios that would be discussed during class periods. Student interview statements included: "I have suggested if we get the assignment the day before and then when we come to class we can present fully prepared" (MC 8, Week 7) and, "They never give us the case study until we are in the classroom" (RC 9, Week 11).

A better alignment with flipped classroom strategy concerning case studies was

recommended in later student discussions with faculty members resulting in a favorable change: “Just about two weeks ago … they started posting the case studies online for us in advance. I started trying to answer the questions, too. Then when they started presenting I could now understand. I like it much better….” (RC 11, Week 14). Noted in later interviews as well as in researcher classroom observation notes, this one change made a dramatic difference in preparation and researcher observations of presentations and engaging classroom discussions of case studies during the class. This change positively impacted student opinions concerning the flipped classroom methodology. A final interviewee comment was that this helped prepare her for actual situations: “When we come to the hospital, we get those same questions and we can then answer them” (RC 11, Week 14).

Group presentations. Group presentations surfaced as one of the most discussed concerns within the study. During early interviews, group presentations were criticized: “The problem is that they are a little too group heavy with case studies, we don’t have time to research them before delivering; it’s difficult with 80 in our class then an added 22 in [regional campus]” (MC 9, Week 7). Students were relegated to use class time to meet in their groups and prepare for group presentations. Students from the main campus expressed difficulty with and frustration concerning the number of groups and the time they spent just reading from the book with little input from the instructors confirming or tying in the answers with real-world activities.

Students from the regional campus were frustrated in that they only had five groups to present, and they had to listen to twice that many groups at the main campus. A real concern about group presentations for regional campus students was that the out-of-

service camera at the back of the classroom prevented them from making presentations at the front of their classroom facing their students. It was awkward for them as they had to face the camera that was located at the front right corner of the room to present. So, they were standing in the middle of their classroom with their backs to their classmates when presenting. Students found this unsettling, as previously discussed.

Instructor Technology Training

Research "tells us that two-way, interactive videoconferencing and on demand, video streaming technologies can be extremely effective media for delivering quality education to a broad, geographically dispersed student population" (Greenberg, 2009, p. 6). Greenberg also stated that, "There are plenty of cases of technology that sits idle because its acquisition was viewed as the hard part, when in fact the real work had … everything to do with planning and training" (Greenberg, 2009, p. 6). In the present study, faculty training was recommended concerning VC use in the classroom. Comments made in early interviews remained consistent across all interviews during the semester. Student opinions were that, "The technology is useful but they haven't learned to use it effectively"(see Appendix G). In the early interviews, students tended to give faculty the benefit of the doubt believing that it was a new innovation for them as well: "I don't mind the VC, but the overall impression is that the professors are not that great at it" (see Appendix G). After the initial few weeks of the semester, students noted that instructors appeared to have a bit more facility with it, but were attributed with what Rogers (2003) termed individual blame in statements such as: "I think user malfunction is the problem" (see Appendix G). Nearing the end of the semester, students acknowledged that, "Now at the end of the semester, they seem like they know more about what they

can do" but remained critical of instructor usage of VC technology: "The user of the technology is what makes the difference" (see Appendix G).

Nearing the end of the semester, the researcher observed instructors attempting to switch views during class. One stated, "We need a little cheat sheet up here to give instructions on how to switch screens" (Observation 14, Week 14, 10:15 a.m., November 26, 2014). The VC tech instructional manual was on the console next to where the instructors were trying to switch views. This trend among the five instructors concerning interaction with technology was best stated by the main campus focus group: "If they haven't learned it there seems to be no incentive to learn it. There needs to be a change" (MCFG interviewee 1).

According to Rogers (2003), two forms of rejection of an innovation can occur at any time throughout the innovation-decision process: active rejection and passive rejection. Active rejection is more obvious and needs little explanation. Passive rejection is what was viewed most frequently in the classroom. A statement during the main campus focus group was, "The instructors don't seem willing to adapt to the technology necessary to provide teaching in a way that we can learn" (MCFG interviewee 3). An example of passive rejection is when instructors refuse to accept optional technology orientation and training from the media technology department (Observation 4, 1:00 p.m., September 4, 2014). When attempting to use the equipment in front of 100 students and fumbling through the process to the point of apologizing to the group and blaming the technology for the error, that is particularly disruptive not only to student learning, but also to the survival of the technology (Observation 5, 12:10 p.m., September 11, 2014). Students in the regional campus focus group stated: "If the instructors went through all

the training, they would know what to do ....” (RCFG, interviewee 3). Childers and Berner (2000) recommended building in extra time when including an instructor unfamiliar with distance learning technologies due to the time required to acclimate to the nontraditional environment. Even though this particular group of instructors was familiar with VC technology, they showed only basic skills in need of advancement to handle the advanced aspects of the technology.

Faculty training, according to discussions with the media technology specialists, would require a very short introduction prior to the beginning of the semester. Ongoing and frequent training in a group or to individuals were offered as options so faculty members can gain fundamental facility of VC technology before presenting in class at the start of the semester. Then, ongoing training could be conducted at periodic intervals to address and train on issues that occur between training periods. Noted by focus group interviewees: “They shouldn’t have an in-class setup and training, training should be done before the semester begins. It’s like driving a car, you have to know everything that is going on in that car before you drive it” (MCFG, Interviewee 1).

In the existing VC system, technical aspects include manual operation of camera angles, close-ups, and panning capabilities available to the broadcast instructor so that if the instructor asked a question of a student located at the distant site, the camera angle can be manipulated to give a close-up of the student asking a question or responding to a question that was asked of him or her. Other capabilities such as picture-within-picture mode could be used to place a small picture of the presenter, or faculty member on the same screen as the material being displayed on the projection screen located at the front of the room. The distant site students would then have the ability to view the material

presented such as in a PowerPoint slide, while maintaining a constant view of the instructor. This situation would closely match that of students sitting at the broadcast site with the instructor present (Observation, media technician training, August 26, 2014).

Stated by many of the interviewees experiencing the distant site, one of the things most troublesome was that they wanted "… to be able to hear, understand, and be able to ask questions freely" (see Appendix G). In researcher observations, the majority of instructors appeared to be unaware of technology capabilities beyond the most basic functions. For example, instructors had no knowledge that it was possible to have picture-within-picture as one option, rather than displaying only one form of media at a time on the projection screen. This would allow students at the receiving site to have a constant view of the instructor and material presented on screen. The researcher was able to confirm this early in the semester in discussions with the media technologist. Also discovered during those discussions was that training was offered to nursing faculty, but it was optional and rarely requested. Training and ongoing workshops provided by the media technology department would assist faculty in learning the capabilities of the existing VC system where they would gain confidence in the basics of connecting classes, adjusting volume, camera angle, and other fundamental activities used in daily operation. This would also lay the foundation for more complex actions such as camera close-ups, picture-within-picture options, and other activities to gain confidence among faculty members using VC technology. This would also assist students in the uncertainty reduction necessary to become comfortable within the VC environment. This would also reduce critical statements from students such as: "It's not reassuring that they don't know how to make it work" and, "Maybe the IT should install and teach the staff how to

manage the equipment" (see Appendix G).

Student Orientation

Video conference technology has been in use since 2006 in the present nursing program. All classes prior to this particular cohort in the nursing program started their first semester using VC technology. Although nursing students in the present study were second semester nursing students with multiple years of classroom or online experience in college courses, only a few students had prior experience in courses that used VC technology. The college did not use VC technology in the first semester with this particular group of students who were now entering their second semester with no knowledge or awareness of its use in previous cohorts. This situation was overlooked by faculty and administrators and orientation was not considered. In Knowles et al.'s (2005) discussion of andragogy, adult learners have a need to know; they want to know and understand so they can quickly agree and begin to participate in the learning environment. Without that important step, students will experience stress and disorientation followed by a loss of motivation. In Rogers (2003) the first stage in the innovation decision process is the knowledge stage in which how-to knowledge is crucial. Rogers stated that "To date, few diffusion investigations deal with how-to knowledge, although it must be a fundamental variable in the innovation-decision process" (p. 173). This might explain why the students in the present study experienced disorientation, disillusionment, and anxiety at the beginning of the course. The orientation loosely consisted of students being told there would be case studies, pre-assigned groups, and extensive use of simulcast and that they would enjoy it (see Table 5). In later interviews it was stated that students lost much of the earlier class learning

opportunities due to anxiety and disorientation concerning this very different type of class operation. In later interviews, a more common statement was, “In the beginning I didn’t like it at all. Now I’m used to it” (see Appendix G). Over time, students adjusted while arriving at their own conclusions. A similar occurrence was reported in Karal et al. (2011)—that students expressed hesitation and concern about participating in VC courses in the beginning. However, throughout the course researchers made the observation that students became less apprehensive and more comfortable with the technology as the course progressed. Consensus among students in the Karal et al. study was to adopt the technology for students, but to notify students during enrollment that the course makes extensive use of VC technology in facilitating the program.

Considering that VC technology provides similarities of both synchronous online communication and face-to-face classroom environments, students should receive orientation covering at a minimum: (a) Understanding similarities and the unique nuances of VC technology; (b) Explanation of VC technology equipment and how it works; and (c) Communication protocol and etiquette when interacting with instructors and students between sites.

Understanding of the similarities and unique nuances of VC technology. Video conference technology is new to most students entering the nursing program. Therefore, this brief introduction will serve to initiate the beginning of the knowledge stage in diffusion of innovations theory (Rogers, 2003). This will also serve to lay the foundation for the uncertainty reduction necessary for innovations to gain favorable adoption decisions.

Explanation of VC technology equipment and how it works. Tech savvy

instructors and media technology specialists should co-present in a 10–15 minute segment, with media techs and instructors at both sites taking part in this segment. Rather than telling, the instructor will engage in dialogue with students of both sites to help them experience the technology while talking about the purpose for its use and the benefit it provides the students.

Communication protocol and etiquette when interacting with instructors and students between sites. In a typical class when a student has a need for clarification, they usually raise their hand the moment they have a question, or at least make some movement to get the instructor's attention. The instructor acknowledges this and addresses the student's concern at the moment through an instant communication dialogue. In VC courses at the broadcast site, communication occurs the same way; however, when students at the receiving site have a question, they must rely on the instructor to see the hand raised from a monitor. The monitor has to be large enough and positioned in the instructor's line of sight in order for them to see and acknowledge the raised hand. There are times when a raised hand is not acknowledged in either face-to-face or distance locations, for instance, when an instructor's back is turned or the lights are dim. In these situations, it is common for a student in a live classroom to simply blurt out politely to get the instructor's attention. Students at the receiving site during a VC broadcast previously expressed their shyness or hesitancy to break in on the presentation or to blurt out their question. Students must be informed concerning voice-activated microphones and two-second delays common in VC technology. Much like trying to communicate on a speaker phone, simultaneous talking between people at both ends of the communication result in one of the statements not being transmitted or in both

statements becoming garbled. When that occurs, communication is disrupted and the delay that occurs when each is trying to be over-polite or just getting heard begins to diminish the reason for the interruption in the first place. Students must learn to exercise a brief pause between speakers due to the delay in communication. Once this protocol is understood, it will become less a problem and will also serve in further uncertainty reduction outcomes. Additionally, students at a minimum, should be provided with contact communication numbers and emails with the recommendation to use them on a timely basis. If they have a question and it is not appropriate to ask it the instant it comes up, they should email or phone the instructor immediately after class.

This student orientation lays the foundation for an ongoing dialogue for constant improvement of interaction, which will serve to (a) satisfy learners need to know; (b) serve as a point of entry into the knowledge stage of innovation decision; (c) as uncertainty reduction necessary for favorable innovation adoption decisions; and (d) as a moment of empowerment where students are recognized as stakeholders with important input concerning use of the technology in the classroom.

Rogers (2003) explained that stakeholder buy-in is crucial to influencing individuals through the innovation-decision process. When students are treated like stakeholders and their opinions are valued, the result is that the innovation is more likely accepted rather than rejected. In a mandatory decision, as is the case concerning the college decision to implement VC technology, students have very little say regarding its use. However, if they are the receivers of the technology, opening an ongoing dialogue where students can recommend ways their academic experience can be improved through its use, VC technology can be ushered through what Rogers referred to as reinvention.

Reinvention is customizing the innovation in some way to make it more suitable for the situation in which it is used, thus increasing the likelihood of adoption. In this case, if VC technology gains full acceptance, other academic centers within the college may consider its use in an expansion of programs to increase academic opportunity for students seeking degrees offered at the college other than nursing.

Summary of Recommendations

Recommended were reinvention of VC technology at the college in four categories: equipment, teaching methodology, instructor technology training, and student orientation. These four categories each have an effect on the fifth category—interaction. It is believed that modification in these four areas will improve interaction, which is considered key for student academic success, as well as in majority innovation decisions favorable to the continued adoption of VC technology in the college nursing program. Rogers (2003) stated that decisions to reject a previously accepted innovation can occur at any stage in the innovation decision process. Further, dissonance such as previously described can be substantially disruptive in the implementation stage of adoption.

Limitations

This qualitative case study was designed to collect and analyze student opinions of VC technology use in the nursing program at a large college of nursing. The study was limited to include 32, second semester nursing students who were exposed to VC technology in the nursing program for the first time. Student opinions were collected through personal interviews, focus groups, classroom observations, and EOC summary comments, which were triangulated for validity. This case study did not include interview data from the instructors, which might have provided an additional dimension to the

study.

Summary

In this present case study, student opinions were collected through personal interviews, focus groups, EOC summaries, and classroom observations then triangulated for validity. Two cycles of coding resulted in 67 codes that separated into five categories; then further distilled into three emerging themes. These three themes were directly related to the importance students place on interactivity with instructors, students, and materials in a distance learning environment; the influence instructors have on adoption decisions impacting instructional technology; and, the importance of recommendations from users and receivers of the innovation when considering reinvention or modifications for improvement to innovations within academic organizations.

Clark (2012) argued that it is not the technology that enhances education; that studies which show this, are confounded in ways that measure or display results; that "media are mere vehicles" (p. 1). The results of the present case study are in agreement with Clark. However, the present study showed that regarding student opinions, technology was evidenced at having restricted the flow of information and communication of information from student-instructor, student-student, and student-information interaction. This restricting of interaction may be a contributing factor concerning why there is a difference in NCLEX-RN first time pass rate percentages between the main campus and regional campus of the present study.

Recommendations for reinvention made by students flowed in the 5 categories, equipment, interaction, teaching methodology, faculty training, and student orientation. All five categories should be considered as reinvention activities during the

implementation stage. Rogers (2003) stated: "Further, the degree to which an innovation is *reinvented*…is positively related to the innovation's sustainability" (p. 429).

Recommendations for Future Studies

Specific to the college of nursing where the case study was conducted: It is the recommendation to implement changes and conduct a follow up study to determine to what extent reinvention improves satisfaction on the part of students and instructors. A correlative study may be able to relate the effectiveness of dissonance reduction that the implemented changes promote; then, compare the NCLEX-RN pass rate percentage to determine whether reinvention impacts the current performance gap between the two sites. Though, studies show there is no significant difference in learning outcome attributable to various media (Clark, 2012; Russell, 1999); however, this study shows there is concern expressed by receivers of the innovation that faulty technology and passive rejection on the part of users of the technology can inhibit interaction, which does correlate with academic achievement.

Additionally, more studies are needed that will contribute to the growing body of knowledge concerning diffusion of innovations in education; specifically in the area of "receivers of innovation diffusion" (Rogers & Jain, 1968, p.1). Rogers (2003) and the researcher of the present study concur that investigation of behavior concerning the effect of passive rejection on discontinuation of an innovation in organizations; and, to what extent how-to knowledge has on innovation decisions, are also recommended. Further, more studies should include in-depth investigation of how reinvention impacts acceptance levels of innovations within academic organizations.

Research was conducted to answer the research question Is VC technology a viable course delivery option for nontraditional degree-seeking undergraduate students? The answer is yes, it is; or it can be. VC technology was adopted and implemented in 2006 for the purpose of expanding the college nursing program to a regional campus situated in a large community that was in need of professionally trained and licensed nurses. To satisfy accreditation requirements, the college opted to make use of VC technology to create parity between campuses. In that regard, VC technology was a success. However, in 2014 the present case study was conducted with results that more than one third of the students interviewed rejected VC technology regarding it less than adequate for the purpose of extending academic opportunity to distance learners. Of the remaining two thirds, the majority accepted VC technology as viable but in need of modification; modifications that would assist distant learners to experience the same level of interaction as students who were in the broadcast class with the instructor. Once modified, the students would consider VC technology to facilitate an academic opportunity that is in parity with both the broadcast and receiving locations. Although the majority of students believed the onus of academic success rested within themselves, there was a common belief that the VC technology in its present state did more to restrict the flow of information than facilitate it. In that regard, modification to the VC system is needed to promote interaction between students, instructors, and material; interaction conducive to a positive learning environment.

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Appendix A

Personal Interview Questions

Personal Interview Questions

1. During the fall 2014 semester, you are currently participating in a course facilitated through VC technology. What prompted you to enroll in the course? How did you feel initially about taking a VC course? Did or do you intend to complete the course? At the time of this interview what week are you in of the current term? How have your initial feelings about the course changed to this point in the semester?

2. Concerning the actual classroom environment: Have there been moments when technical or nontechnical issues affected the quality of the course, in your opinion? Can you describe what happened and how "it was" or "they were" resolved? How do you feel about the overall experience?

3. Students typically have certain learning expectations or expected outcomes when taking a class: What expectations did you have upon taking the course through VC technology? Were there any unexpected outcomes, positive or negative, that you feel were a result of participating in a VC course?

4. Are you located at the main campus or the regional campus in the VC course? Do you feel as though you are treated the same as students in the other classroom? If treated differently, in what way(s)? Do you feel that the physical separation from your teacher and/or from other students affect your learning experience in the course(s)? If so, please elaborate why.

5. In alternating class sessions, the course broadcast from your location to the other campus, while in other class sessions your class was the receiving site for course instruction. How would you describe the differences between those class sessions? How would you describe the similarities between those sessions? Did you have any preference between being at the broadcast location or the receiving location? Please elaborate your responses.

6. After participating in this course through VC technology, will you enroll in other courses using VC technology. Please state why or why not.

7. If given the opportunity to design a course using VC technology, what would the course look like? In what ways would it be different than the current VC course in which you are enrolled?

8. In concluding the interview: Is there anything you would like to add or discuss that came to mind during our interview? Do you have any questions?

Appendix B

Focus Group Questions

Focus Group Interview Questions

1. Individually and as a group, what were notable experiences in the course from your first night in class and throughout the semester in which the course was facilitated through VC technology?

2. In what ways would you consider your academic experience better or less resulting from your physical nearness to, or distance from your course instructor and students at the other site?

3. Are you located at the main campus or the regional campus in the VC course? Do you feel as though you are treated the same as students in the other classroom? If treated differently, in what way(s)? Do you feel that the physical distance from your teacher and/or from other students affect your learning experience in the course(s)? If so, please elaborate why.

4. In alternating class sessions, the course broadcast from your location to the other campus, while in other class sessions your class was the receiving site for course instruction. How would you describe the differences between those class sessions? How would you describe the similarities between those sessions? Did you have any preference between being at the broadcast location or the receiving location? Please elaborate your responses.

5. If given the option to complete your nursing degree predominantly through VC courses, would you exercise that option? Please explain your answers.

6. Given, what you experienced throughout the course with VC technology: What would you recommend to improve, change, correct, or in other words, enhance your experience as a student participating in studies at a distance campus of the college?

Appendix C

Demographic Information Questionnaire

Demographic Information Questionnaire

Thank you for agreeing to participate in this research study concerning student perceptions of VC courses for nontraditional undergraduate learners. Please answer the following questions.

1. Age: _____.

2. Gender: F or M

3. Race: _____.

4. In addition to attending nursing school, do you work outside the home? Y or N? If yes, is it full-time or part-time?

5. Do you have family responsibilities such as children in your household? Y or N

6. What is your roundtrip commute time to school each day? _____

7. Major or Degree of interest: _____.

8. Number of college credit hours completed prior to enrolling in the VC course: _____.

9. Course in which you are participating through VC technology during the academic semester fall 2014 (e.g., MATH 1000, SPCH 1500, etc.):_____.

10. Anticipated grade earned in above listed course (A-F): _____.

Appendix D

Personal Interview Protocol

Email, In-Person, and Telephone Interview Protocol

Interview Date:
Interview Option:
Interview Location:
Interview Time Started:
Interview Time Ended:
Interviewee:
Student of Site: Main Campus / Regional Campus

Opening Statement:

Hi, this is Bruce Campbell, doctoral student from Nova Southeastern University. Thank you for consenting to this interview. As discussed, this will be a confidential interview and your privacy will be protected. However, for accuracy and to assist in the analysis, interview notes will be handwritten or typed during this interview as well as all others. Thank you for signing and returning the consent form.

As you know, this study seeks to determine whether VC technology is a viable method of delivery to degree-seeking nursing students, especially nontraditional students, who attend one of the campuses of the college being studied. Your candid responses to the questions will be appreciated.

Interview Questions:

1. During the fall 2014 semester, you participated in a courses facilitated through VC technology. What prompted you to enroll in the course? How did you feel initially about taking a VC course? Did or do you intend to complete the course? At the time of this interview what week are you in of the current term? How have your initial feelings about the course changed to this point in the semester?

2. Concerning the actual classroom environment: Throughout your course, so far, was there a moment when the quality of your learning experience was diminished by technical or nontechnical issues? Can you describe what happened and how "it was" or "they were" resolved? How do you feel about the overall experience?

3. Students typically have certain learning expectations or expected outcomes when taking a class: What expectations did you have upon taking the course through VC technology? Were those expectations met? Were there any unexpected outcomes, positive or negative, that you feel were a result of participating in a VC course?

4. Are you located at the main campus or the regional campus in the VC course? Do you feel as though you are treated the same as students in the other classroom? If

treated differently, in what way(s)? Do you feel that the physical separation from your teacher and/or from other students affect your learning experience in the course(s)? If so, please elaborate why.

5. In alternating class sessions, the course broadcast from your location to the other campus, while in other class sessions your class was the receiving site for course instruction. How would you describe the differences between those class sessions? How would you describe the similarities between those sessions? Did you have any preference between being at the broadcast location or the receiving location? Please elaborate your responses.

6. After participating in this course through VC technology, if will you enroll in other courses that are offered using VC technology? Please state why or why not.

7. If given the opportunity to design a course using VC technology, what would the course look like? In what ways would it be different than the current VC course in which you are enrolled?

8. Before concluding the interview: Is there anything you would like to add or discuss that came to mind during this interview, but was not addressed; or, do you have any questions for me?

Closing Statement:

Thank you. You have been very helpful in sharing your perceptions concerning VC technology and the way it was used when facilitating courses in which you participated. I appreciate your help. Is there anyone that was in your course that you remember and can refer for an interview?

Appendix E

Focus Group Interview Protocol

Focus Group Interview Protocol

Interview Date:
Interview Option:
Interview Location:
Interview Time Started:
Interview Time Ended:
Interviewees Initials:
Students of Site: Main Campus / Regional Campus

Opening Statement:

Hi, my name is Bruce Campbell, doctoral student from Nova Southeastern University. Thank you for consenting to this interview. As discussed, this will be a confidential interview and your privacy will be protected. For accuracy in analysis, notes will be handwritten or typed during this interview as well as all others. Thank you for signing and returning the consent form.

As you know, this study seeks to determine whether VC technology is a viable method of delivery to degree-seeking nursing students, especially nontraditional students, who attend one of the campuses of the college being studied. Your candid responses to the questions will be appreciated.

Interview Questions:

1. Individually and as a group, what were notable experiences in the course from your first night in class and throughout the semester in which VC technology was used in facilitating the course(s), in which you participated?

2. In what ways would you consider your academic experience better or less resulting from your physical nearness to, or distance from your course instructor and students at the other site?

3. Are you located at the main campus or the regional campus in the VC course? Do you feel as though you are treated the same as students in the other classroom? If treated differently, in what way(s)? Do you feel that the physical distance from your teacher and/or from other students affect your learning experience in the course(s)? If so, please elaborate why.

4. In alternating class sessions, the course broadcast from your location to the other campus, while in other class sessions your class was the receiving site for course instruction. How would you describe the differences between those class sessions? How

would you describe the similarities between those sessions? Did you have any preference between being at the broadcast location or the receiving location? Please elaborate your responses.

5. If given the option to complete your nursing degree predominantly through VC courses, would you exercise that option? Why or why not?

6. Given, what you experienced throughout the semester in which VC technology was used for course delivery: What would you recommend to improve, change, correct, or in other words, enhance your experience as a student participating in studies at a distance campus of the university?

Closing Statement:

Thank you. You have all been very helpful in sharing your opinions concerning VC technology and the way it was used when facilitating courses in which you participated at the regional campus where you attended. I appreciate your help. Do any of you have questions for me?

Appendix F

End of Course Summary

Comments on Simulcasting Fall 2014

The following are direct quotes on anonymous evaluations provided by Semester 2 students at the end of their semester.

[Main] Campus Students

Simulcasting is horrible, there's got to be another way.

As for the simulcasting, I felt that it was hard to understand when the [Regional Campus] group was presenting. We were never able to see their instructor lecture. It felt like a big disconnect. It would save a lot of time if at least one instructor was able to work the computer and get [Regional Campus] on the projector easily.

The whole simulcasting is very distracting. It's hard to keep focused and learn.

Simulcast is distracting to learning and I believe it takes up time from learning when there are "technical difficulties".

Didn't care for the simulcast experience.

I don't like simulcasting and too many instructors.

The [Regional Campus] simulcasting this semester has been the biggest distraction, especially in combination with the flipped classroom. It is impossible to understand most of what they say over the speakers and I feel like class is pointless.

I did not like simulcasting because it is too distracting with background noise and too much back and forth.

Simulcasting was okay. It was hard at times when some of the professors don't understand how to use the technology properly.

I don't like the simulcast. It is too distracting trying to pay attention to a video recording of the other lecture. They can't see us. Too hard to pay attention when [Regional Campus] has the lecture!

Overall I feel like I have learned a lot from this program but not from the simulcast. I did not enjoy the simulcast at all.

As far as the teaching technique, I don't enjoy learning through the simulcast. I find it to be more distracting than anything.

Regional Campus Students

The simulcast might work for [Main Campus] but for [Regional Campus] it's as if we

don’t exist. [Regional Campus] can’t make any noise yet [Main Campus] has no problem disrespecting us.

The concept of distance can be very effective, as long as all the equipment works properly and the teachers are engaging and are able to explain the material well. This semester showed the need to improve media/hardware use, as there were technical difficulties (i.e., screen grainy, sound issues, cameras not working).

Lectures are not beneficial as there is so much disruption with telecasting. I’d rather read at home or have our own small groups within our class here in [Regional Campus].

Every teacher involved in simulcast: Learn how to use equipment. This is the school choice for broadcasting not ours. I really do not want to hear “I’m not good with technology”.

The telecast is awful and the excuse of it being a part of the curriculum and not being able to be modified is not fair because a lot of student struggle from this type of learning style.

L. B. H., MSN, RN
Director, Nursing Program
State College

Note. EOC Summary comments concerning VC technology use were provided courtesy of Director of Nursing from the college.

Appendix G

Codebook

Campbell Codebook 2014

Theory-based/ priori codes	Description	Campus Location		#Times Stated
		RC	MC	Totals
Andragogy	Need to know	13	15	28
	Self-efficacy	7	13	20
	Motivation	5	6	11
	Locus of control	7	3	10
	Independent learning	6	4	10
Theory of Margin	Time-management	29	12	41
	Sense of Urgency	7	2	9
	Nontraditional age learner	11	9	20 of 32
Diffusion of Innovations				
Attributes of innovation	Innovation attributes			
Relative advantage	Rel. adv. characteristics	3	1	4
Compatibility	Uncertainty reduction	15	6	21
Complexity	Technology anxiety	5	0	5
	Technical issues			
	Equipment			
	Monitor/No monitor	11	35	46
	Audio	19	20	39
	Microphones	21	17	38
	Camera	12	13	25
	Video	6	8	14
	Projector/Screen	4	3	7
	Room layout	2	4	6
	Lighting	1	0	1
	Equipment Combined Total	**76**	**100**	**176**
	User error -Instructor	9	14	23
	User error -Student	2	0	2
Trialability	Experience			
	Negative	11	18	29
	Positive	5	7	12
Observability	Anticipated/expected outcome	12	1	13
5 Decision Stages				
Knowledge Stage	How-to knowledge			
	Faculty	25	53	78
	Students	15	11	26
Persuasion	Attitude formation			

Stage				
	Positive	7	6	13
	Negative	27	31	58
Decisions	**Acceptance**			
	As is	**1**	**5**	**6 (18.75%)**
62.5% Acceptance	**With modifications**	**3**	**11**	**14 (43.75%)**
37.5% Rejection	**Rejection-**			
	Active – Student Decision	**12**	**0**	**12 (37.5%)**
	Passive rejection - Instructor	20	28	48
Implementation Stage	Reinvention/Customization	28	12	40
Confirmation Stage	Dissonance	2	5	7
	Disenchantment	7	8	15
	Information avoidance/rejection	16	4	20
SYSTEM BLAME	Innovation not appropriate for use	5	1	6
	Data-driven; a priori codes			
In Vivo Coding				
	"I have a preference to be where the instructor is because if you have a question, you can ask them"	16	15	31
	"I think that interaction between the people is what VC is about"	15	10	25
	"They told us you have to figure it out and make it work"	16	4	20
	"I think user malfunction is the problem"	10	8	18
	"I don't mind the VC, but the overall impression is that the professors are not that great at it"	13	2	15
	"The user of the technology is what makes the difference"	5	10	15
	"I was annoyed by the technology"	11	1	12
	"When I can't hear I automatically tune out instruction"	2	10	12
	"It won't be like 22 students anymore"	10	0	10
	"[Regional campus] can you hear me?"	8	2	10
	"I want to be able to hear, understand, and be able to ask questions freely"	2	8	10

	"Now at the end of the semester, they seem like they know more about what they can do"	0	10	10
	"I believe my grades are dependent on me and not things around me"	7	2	9
	"In the beginning I didn't like it at all. Now I'm used to it"	3	4	7
	"I like to hear from the other instructors"	5	1	6
	"Having the best instructor takes priority over the technology"	5	0	5
	"Our microphone is so sensitive, that we can't move or make noise"	4	1	5
	"I like the idea of VC tech but it needs to be better"	3	2	5
	"Maybe the IT should install and teach the staff how to manage the equipment"	2	3	5
	"The technology is useful but they haven't learned to use it effectively"	0	5	5
	"When we are on the receiving end, we feel disconnected"	0	5	5
	"I'm a hands-on student. It's hard to interact with VC"	3	1	4
	"It's highly unproductive for me personally"	3	1	4
	"They told us to keep quiet"	3	0	3
	"Having a VC course with high powered presenters is good"	2	1	3
	"I am not opposed to VC, but not if it is set up the way this is designed"	2	1	3
	"It's just an extended classroom with 22 more people"	0	3	3
	"I'm not against it…but, would not want to be in the receiving site"	0	3	3
	"The professor would tip the scales of having a VC class"	1	1	2
	"It's not reassuring that they don't know how to make it work."	0	1	1
Open Coding/ Eclectic Coding				
Instructor-led Interaction	Instructor-instructor interaction	1	2	3
	Instructor-student interaction	13	11	24

Student-led Interaction	Instructor-technology interaction	10	13	23
	Student-instructor interaction	19	11	30
	Student-student interaction	15	33	48
	Student-technology interaction	4	4	8
	Student-material interaction	12	6	18
	Student feeling isolated disengaged	22	25	47
	Interaction Combined Total	**96**	**105**	**201**

	Categories			
Dep. Var.	**Interaction**			**Tot. 201**
Ind. Var.	**Equipment**			**Tot. 176**
Ind. Var.	**Teaching methodology**			
	Flipped classroom	20	23	43
	Case study presentations	16	15	31
	Classroom management	19	15	34
	Group teaching approach	2	11	13
	Combined Total	**57**	**64**	**Tot. 121**
Ind. Var.	**Instructor technology training**	42	44	**Tot. 86**
Ind. Var.	**Student orientation**	33	31	**Tot. 64**

Appendix H

VC Tech Inventory List

Videoconference Equipment List

Regional Campus

Current Hardware:

2 – PTZ cameras/RCA video/Cat5 – both cameras controlled by AMX touch panel

All below items are controlled by 3x1 independent Matrix switcher:
1 – Document camera / VGA
1 – Computer / VGA
1 – Combo VCR/DVD/RCA video and audio
1 – TOA 8503 amplifier / 2 – powered 6" speakers for incoming signal from remote site / speaker wire
1 – TOA BA-235 amplified / 2-passive JBL Control 26 speakers for computer/combo VCR/DVD/data projector
1 – Wire microphone
1 – Ceiling microphone attached to sound amplification hood mounted at front of classroom on ceiling
1 – NEC data projector / RCA for video / VGA for Matrix switcher and VGA for guest port
1 – Extron P2DDA4xi/P2DA6xi VGA distribution amplifier for boosting all VGA signals
1 – Tandberg model TAM3 / codec 25A033131
1 – Smart Technologies Sympodium / VGA
1 – AMX touch panel control / interfaces with Tandberg
1 – wireless mouse / USAB
1 – 6' projection screen

Room Dimensions:

Width (Screen Wall): 21'3"
Length (Side Walls): 26'
Height (Ceiling): 8'10"

Main Campus

Current Hardware:

2 – Tandberg unit IV, WAVE II,PTZ cameras / RCA video / Cat5 control – both cameras controlled by AMX touch panel Educator 2
1 – 42" Plasma monitor for incoming signal (remote site view) RCA signal, ON/OFF control by its own remote control.
1 – Document camera / Composite
1 – Computer / VGA
1 – Combo VCR/DVD/RCA video and audio
1 – Overhead Projector
1 – Amplifier / 4-JBL speakers for incoming/outgoing signal
1 – Wireless microphone (SHURE)
1 – Wire microphone
6 – Ceiling Microphones for sending student/audience voice signal to remote sites
1 – Hitachi data projector / RCA for local video and incoming remote signal/VGA for local computer/guest laptop port
1 –Tandberg model TAM/Codec version: Tandberg 6000, 3072/768 kbit/s
1 – AMX touch panel control / interfaces with Tandberg
1 – wireless mouse / USB
1 – Draper 12' motorized projection screen
1 – VGA Splitter/breakout box

Room Dimensions:

Width (Screen Wall): 40'
Length (Side Walls): 60'
Height (Ceiling): 12' from front of room to 8' to back of the room.

Note. VC tech inventory list provided by Instructional Media department of college.